Preface

Prof. Yafang Han
IUMRS President
2019-2020

Three decades have passed since the founding of IUMMRS (International Union of Materials Research Societies) in 1991 or even further back to 1984/5 in an original form of an operating committee. At this particular moment of IUMRS's 30th anniversary, this commemorating book is compiled to record its past history and recent status with abundant words, comments from past distinguished leaders, members and volunteers, photos of events, figures, and an in-depth review of IUMRS's evolution.

In brief, this book consists of eight chapters, which are:

1. Introduction on IUMRS structure, officers and governing bodies;
2. IUMRS history. Words from founding scientists, volunteers and those who have substantially dedicated to the development of IUMRS;
3. IUMRS presidents, EC members, GA meeting, and relevant words and reviews;
4. Detailed profiles and development courses of thirteen adhering bodies;
5. IUMRS conferences;
6. IUMRS awards;
7. IUMRS statutes and by-laws;
8. IUMRS Future.

For decades, IUMRS has never deviated from its original mission *"...to serve and lead, through research and education, the global materials community in support of a sustainable world by processing and regeneration new materials for all citizens."* Since its founding, IUMRS has seen an expansion of its membership from eight to sixteen from all five continents, and births of a series of International Conferences such as ICEM, ICAM, ICA, WMS, ICYRAM and more regional and international co-organized conferences by member societies, and a variety of awards, publications of world reputation. All have served millions of materials researchers worldwide and in return, contributed to a sustainable and fast development of IUMRS.

IUMRS is now moving into a new phase to meet new demands and to better serve the materials community. This book has served as a review but not an end as IUMRS will continue its role as the most favored and productive global organization in the field of materials.

In the end, as immediate past president of IUMRS and editor-in-chief of this book, I would sincerely thank to the supports from all IUMRS member societies, editors and those whose efforts have made this special commemorating book possible and accomplished. Special thanks should go to following individuals who have made tremendous contribution to the founding and development of IUMRS voluntarily during the last 30 years. They are: Prof. R.P.H Chang, Prof. Paul Siffert, Dr. Elton N. Kaufmann, Prof. John Baglin, Prof. Masao Doyama and Prof. Shigeyuki Sômiya, Prof. Hengde Li, Prof. Jim Williams, Prof. C. N. R. Rao and Prof. Lih J. Chen and so on.

Special thanks should also belong to following full-time and part-time staffs at IUMRS headquarter office who have made great contribution during the process of collection of information and articles, and compiling of this book. They are Prof. Michael Driver, Ms. Geok Chooi Lou, Dr. Fenfen Liang, Ms. Xiaomei Ma, Prof. Ziqiang Dong, Ms. Xi Han and Mr. Jianyun Lin.

I sincerely apologize for any omissions in this book since gathering all details that witnessing the history of IUMRS has been a highly demanding job duo to the frequent personnel change among directors and staffs of IUMRS adhering bodies.

Once again. Thank you all.

April 28, 2021, Beijing

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Chapter 1 About IUMRS

1.1 Introduction of IUMRS by IUMRS Founding President Prof. R. P. H Chang

Prof. R. P. H Chang
Northwestern University, USA

It is a great honor for me to write this introduction to the document commemorating the 30th Anniversary of the founding of the International Union of Materials Research Societies (IUMRS). IUMRS was founded in 1991 as a formal organization representing a number of international materials research societies but it has its origins further back in time in a committee operating in 1984/5. An excellent account of the history of IUMRS is given below by John Baglin and Paul Siffert.

*The "**Mission**" of the IUMRS is to serve and lead, through research and education, the global materials community in support of a sustainable world by processing and regeneration new materials for all citizens.*

The founding members of IUMRS were societies from the United States (MRS), Europe (E-MRS), MRS-Japan, Chinese MRS, Mexican-MRS, MRS-Taiwan, MRS-India and Australian-MRS. These were joined later by MRS-Russia, MRS-Singapore, MRS-Korea, MRS-Brazil, MRS-Argentina, African-MRS and, most recently MRS Indonesia, and MRS-Thailand. These societies have contributed to this document on their histories and planed for the future, with many pictures taken during meetings hosted by them.

There are number of people who deserve special recognition for their leadership in the early history of IUMRS. They include Woody White, Elton Kaufmann, Masao Doyama, Paul Siffert, John Balance, John Baglin, and many others. In the mid to late eighties, MRS played a key role in hosting annual meetings in Boston to discuss and debate how the to-be-established Union should function. It was finally decided that all adhering bodies would function independently but work closely to promote the mission of providing services and leadership to the global materials community both in research and education.

To bring the global materials community together, it was decided that a series of International Conferences on Advanced Materials (ICAM) and Electronic Materials (ICEM) was to be launched. This was done under the leadership of Masao Doyama in Japan with the support of the MRS and E-MRS starting in 1988. The success of these meeting further propelled the accelerated formation of the IUMRS in 1991.

Since then, other IUMRS meetings such as International Conference in Asia (ICA), and more recently Materials World Summit have been launched with great success. These meetings, in addition to the annual meetings of each individual adhering body, have increased significantly the communication in materials research and education around the world. In 2005, under the leadership of IUMRS president, Zhou Lian, it successfully applied to the International Council for Science (ICSU) for membership as one of the only 29 members.

In parallel to the development of strong communications among materials researchers worldwide, members of the adhering bodies of the IUMRS have also been working with their respective funding agencies to launch multi-lateral research funding initiatives. During a period of 15 years, the National Science Foundation in the US and its counterparts around the world have signed agreements to support joint research programs among materials researchers from all parts of the world. This was done under the Materials World Network Program started in 1995. Through the support of this Program, many international workshops were held and they have also resulted in the establishment of new societies, such as the Brazilian MRS and the African MRS.

Addressing the Future

In retrospect, IUMRS has already fulfilled a large part of its original vision of services to the world materials community but where will it go from here and what are its responsibilities? As we move into the 21st century, we see that the world has greatly changed. Within this century, the world population will reach nearly nine billion. In addition, it is predicted that the supply of oil will peak in about thirty years and then decrease rapidly thereafter. Over the next couple of centuries, it is anticipated that coal will still provide at least one half of the world's energy. Unless new technology is developed, the current rate of coal burning may accelerate global warming and climate change. To provide enough energy, food, water, while protecting the health of all citizens, is such a big challenge that requires the co-operation and collaboration of all nations. Materials research must play a very strategic central role in solving these big global problems. IUMRS is well positioned to help and lead in addressing such challenges. During the past couple of years the General Assembly (GA) of the IUMRS has had many discussions on future initiatives that the IUMRS needs to launch in collaboration with other Unions and members of the ICSU. It is pretty clear that global problems need global resources, talents, expertise and above all co-operation to solve.

As of 2011, the immediate plan of the IUMRS is to launch a Global Materials Network (GMN). The GMN has three main strands:

1.A Network for young materials researchers world-wide through interaction both in real and cyber-space. Young researchers need to be empowered to take lead to solve global problems facing their future.

2.IUMRS, working with other Unions of the ICSU, will establish a Materials Council to develop policies for energy, environment, and education.

3.Building on the success of the Materials World Network, IUMRS will further lead the global efforts in research and education relating to energy, environment, health, security and sustainability.

To launch the first initiative, an IUMRS - International Conference of Young Researchers on Advanced Materials was organized by the Materials Research Society of Singapore, 1-6 July, 2012, in Singapore. The related cyber-infrastructure has been under development. The second initiative is being planned.

The purpose of this Booklet is to commemorate the 30th anniversary of the founding of IUMRS and to give the presidents of the Adhering Bodies an opportunity to tell the history of their societies and describe their leadership and participation in the IUMRS.

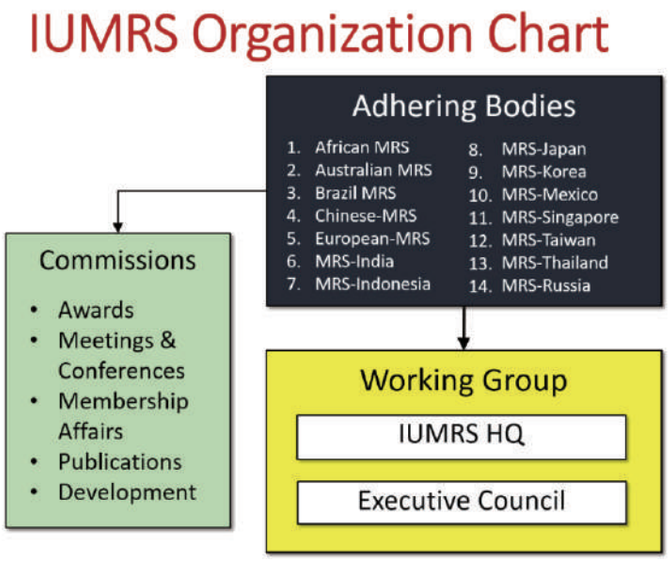
I want to thank Mike Driver who has overseen the production of part of this document, and the staff of MRS, particularly Betsy Fleischer and Mary Kaufold for providing some of the contents.

I believe the IUMRS is truly a unique world materials organization which highly values the leadership and contribution of its members. It is now positioned to further strengthen its collective power to help provide solutions to the greatest global problems facing all mankind. IUMRS welcomes your participation in all of its activities.

R. P. H. (Bob) Chang
IUMRS Founding President
August 2019

◎ R. P. H. (Bob) Chang, Professor. Department of Materials Science and Engineering, Northwestern University, USA.
https://www.mccormick.northwestern.edu/research-faculty/directory/profiles/chang-robert.html

1.2 Structure of IUMRS



1.3 Recent IUMRS officers

2019- 2020:

1.Yafang Han, President 2019-2020, from Chinese-MRS
2.Soo Wohn Lee, Immediate Past President 2019-2020, from MRS-Korea
3.Rodrigo Martins, 1st Vice President 2019-2020, from European-MRS
4.Yuen Peng Feng, 2nd Vice President 2020-2021, from MRS-Singapore
5.Jim S. Williams, Secretary 2019-2020, From Australian-MRS
6.Naoki Kishimoto, Treasurer 2020-2021, from MRS-Japan

2021- 2022:

1.Rodrigo Martins, President 2021-2022, from European-MRS
2.Yafang Han, Immediate Past President 2021-2022, from Chinese-MRS
3.Osvaldo N. Oliveira, 1st Vice President 2021-2022, from MRS-Brazil
4.Yuen Peng Feng, 2nd Vice President 2020-2021, from MRS-Singapore
5.Jim S. Williams, Secretary 2021-2022, from Australian-MRS
6.Naoki Kishimoto, Treasurer 2020-2021, from MRS-Japan

1.4 IUMRS Commission members

2019- 2020

Commission	Members	Role	Emails
Awards (6)	R.P.H. (Bob) Chang	Chair	rphchang@gmail.com
	Rodrigo Martins (E-MRS)	IUMRS Global Leader/Service Award	rm@uninova.pt
	B.V.R. Chowdari (MRS-S)	IUMRS-MRSs Young Researcher Award	chowdari@mrs.org.sg
	Nobuhiro Matsushita (MRS-J)	IUMRS Somiya Award	
	Sharath Sriram (A-MRS)	member	sharath.sriram@rmit.edu.au
	Jian Ji (C-MRS)	member	jijian@zju.edu.cn
Meetings (7)	Osvaldo N. Oliveira (MRS-B)	Chair	chu@ifsc.usp.br
	Naoki Kishimoto (MRS-J)	member	kishin@fa3.so-net.ne.jp
	George Kirakidis (E-MRS)	member	kiriakid@iesl.forth.gr
	Evan Williams (MRS-S)	member	williamse@imre.a-star.edu.sg
	Soo Wohn Lee (MRS-K)	Ex-official member	ecomaterials@sunmoon.ac.kr
	Jim Williams (A-MRS)	EC member as Secretary	Jim.Williams@anu.edu.au
	Paul Horng (MRS-T)	member	jlhorng@itri.org.tw
Publications (6)	Ying Wu (C-MRS)	Chair	wuying@atmcn.com
	Yafang Han (C-MRS)	Ex-official member	yfhan@buaa.edu.cn
	Duan Weng (C-MRS)	member	duanweng@tsinghua.edu.cn
	Wuzong Zhou (UK)	member	wzhou@st-andrews.ac.uk
	George Zheng Chen(UK)	member	George.Chen@nottingham.ac.uk
	Chengtie Wu (C-MRS)	member	chengtiewu@mail.sic.ac.cn
Development (10)	Tao Deng (C-MRS)	Chair	dengtao@sjtu.edu.cn
	Peter Wellmann (E-MRS)	Co-chair	peter.wellmann@fau.de
	Byungha Shin(MRS-K)	member	byungha@kaist.ac.kr
	Giovanni Marletta (E-MRS)	member	gmarletta@unict.it
	Elton N. Kaufmann (USA)	member	eltonk@anl.gov
	Leticia Torres -Martinez (MRS-M)	member	lettorresg@yahoo.com
	Tsong-Pyng Perng (MRS-T)	member	tppperng@mx.nthu.edu.tw
	Yudi Darma (MRS-Ina)	member	yudi@fi.itb.ac.id
	Tim White (MRS-S)	member	tjwhite@ntu.edu.sg
	P. S. Anil Kumar (MRS-I)	member	anil@physics.iisc.ernet.in
Membership (8)	Yuan Ping Feng (MRS-S)	Chair	phyfyp@nus.edu.sg
	John Baglin (USA)	member	baglin@us.ibm.com
	Chennupati Jagadish (A-MRS)	member	Chennupati.Jagadish@anu.edu.au
	Do Kyun Kwon (MRS-K)	member	dkwon@kau.ac.kr
	Ian W. Boyd (E-MRS)	member	Ian.Boyd@brunel.ac.uk
	Santi Maensiri (MRS-Thai)	member	santimaensiri@g.sut.ac.th
	T. T. Song (MRS-T)	member	TTSONG@itri.org.tw
	Ziqiang Dong (C-MRS)	member	zqdong@shu.edu.cn

(2021-)

Commission	Members	Role	email
Awards (6)	Tim White	Chair, and Young Researcher Award	tjwhite@ntu.edu.sg
	Rodrigo Martins (E-MRS)	IUMRS President and Global Leader Award	rm@uninova.pt
	Monica Cotta (MRS-B)	member (F)	monica@ifi.unicamp.br
	Nobuhiro MATSUSHITA(MRS-J)	IUMRS Somiya Award	Need to check status and email address
	Sharath Sriram (A-MRS)	member and young researcher	sharath.sriram@rmit.edu.au
	Jian Ji (C-MRS)	member	jijian@zju.edu.cn
Meetings (9)	Soo Wohn Lee (MRS-K)	Chair	ecomaterials@sunmoon.ac.kr
	Samuel Chigome(African MRS)	member and President of African MRS	SChigome@bitri.co.bw
	Benjamin Agyei-Tuffour (African MRS)	member and young researcher	bagyeituffour@gmail.com
	Sanjay Mathur (Europe)	member	sanjay.mathur@uni-koeln.de
	Claudia Gutierrez Wing (MRS-M)	member and past President of MRS-M (F)	claudia.gutierrez@inin.gob.mx
	Evvy Kartini (MRS-Ina)	member and President of MRS-Ina (F)	evvy.kartini@gmail.com
	Ieda Santos (MRS-B)	member (F)	ieda@quimica.ufp.br
	Saskia Schmmel (E-MRS)	member and young researcher (F)	sas.schimmel@imass.nagoya-u.ac.jp
	Paul Horng (MRS-T)	member and former IUMRS Treasurer	jlhorng@itri.org.tw
Publications (6)	Ying Wu (C-MRS)	Co-chair	wuying@atmcn.com
	Yafang Han (C-MRS)	Co-chair and IUMRS past President	yfhan@buaa.edu.cn
	Xiumei Wang (C-MRS)	member and young researcher (F)	xiumeiwang@tsinghua.edu.cn
	Wuzong Zhou (UK)	member	wzhou@st-andrews.ac.uk
	George Zheng Chen (UK)	member	George.Chen@nottingham.ac.uk
	Chengtie Wu (C-MRS)	member	chengtiewu@mail.sic.ac.cn
Development (11)	Tao Deng (C-MRS)	Co-chair	dengtao@sjtu.edu.cn
	Peter Wellmann (E-MRS)	Co-chair	peter.wellmann@fau.de
	Byungha Shin (MRS-K)	member	byungha@kaist.ac.kr
	Giovanni Marletta (E-MRS)	member	gmarletta@unict.it
	Sean Hearne (USA)	member and past President of MRS	hearnesj@ornl.gov
	Leticia Torres-Martinez (MRS-M)	member and past President of MRS-M (F)	lettorresg@yahoo.com
	Tsong-Pyng Perng(MRS-T)	member	tpperng@mx.nthu.edu.tw
	Giuseppina Padeletti (E-MRS)	member (F)	gpadeletti@gmail.com
	Yudi Darma (MRS-Ina)	member	yudi@fi.itb.ac.id
	Chennupati Jagadish(A-MRS)	member and past President of (A-MRS)	Chennupati.Jagadish@anu.edu.au
	P. S. Anil Kumar (MRS-I)	member and Secretary of MRS-I	anil@physics.iisc.ernet.in
Membership (8)	Yuan Ping Feng (MRS-S)	Chair and IUMRS 2nd VP	phyfyp@nus.edu.sg
	John Baglin (USA)	member and ISC liaison officer	baglin@us.ibm.com
	Joanne Etheridge (A-MRS)	member and President of A-MRS (F)	joanne.etheridge@monash.edu
	Do Kyun Kwon (MRS-K)	member	dkwon@kau.ac.kr
	Ian W. Boyd (E-MRS)	member	Ian.Boyd@brunel.ac.uk
	Santi Maensiri (MRS-Thai)	member and President of MRS-Thai	santimaensiri@g.sut.ac.th
	T. T. Song (MRS-T)	member	TTSONG@itri.org.tw
	Ziqiang Dong (C-MRS)	member	zqdong@shu.edu.cn

1.5 Headquarter office location

1991-2012: 506 Keystone Drive Warrendale, Pennsylvania 15086, USA
2013-2018: 2220 Campus Drive, Evanston, Illinois, 60208, USA
2019-2020: 62 Zizhuyuan Road, Haidian District, Beijing 100048 China
2021- : School of Materials Science & Engineering, 50 Nanyang Avenue, Nanyang Technological University, BLKN4.1, #01-02a, Singapore 639798

Chapter 2 IUMRS History

2.1 Establishment of IUMRS

Foundations

1984/1985: An “International Committee” was informally established, to explore a future formal development of a global Materials Research organization. Leaders of the effort included Woody White, Bob Chang, Elton Kaufmann, Masao Doyama, Paul Siffert, and others. “The purpose of the Committee is to serve as a vehicle for communication between Societies concerned with Materials Research - not as a governing body, but rather to foster interaction among autonomous regional peer Societies in various parts of the World.”

1984-1989: With MRS encouragement and advice, MRS organizations formed independently in Europe, Japan, China, Mexico, Taiwan, India, Australia, and others also developed.

1990-91:Formal establishment of the International Union of Materials Research Societies, with formal incorporation in Pennsylvania, and accounting and banking services generously provided by MRS.The new Union was specifically to be modeled on IUPAP and IUPAC. Founding members were MRS, E-MRS, MRS-Japan, Chinese-MRS, MRS-Mexico, MRS-Taiwan, MRS-India and Australian-MRS.

Registration document showing IUMRS registration date: September 21, 1989

IUMRS was registered as a non-profit organization (501c3) with the IRS (internal Revenue Service) in July 1990. IRS reference EIN 25-162988.

From Professor R. P. H. (Bob)Chang: Origin of IUMRS

The concept of an integrated approach to materials research and education was conceived by Professor Rustum Roy and colleagues at Penn State University in the early 70’s.

Taking this approach, researchers from all fields of materials came together to discuss their investigations led to the establishment of an interdisciplinary and integrated Materials Research Society (MRS) where all aspects of materials are discussed by scientists [e.g. chemists, physicists, biologists]; and engineers under selected themes/topics.

The “Mission” of the IUMRS is to serve and lead, through research and education, the global materials community in support of a sustainable world by processing and regeneration of new materials for all citizens.

Copyright record from US government website: Registration of IUMRS word mark and logo

http://tmsearch.uspto.gov/

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76198149	2569740	INTERNATIONAL UNION OF MATERIALS RESEARCH SOCIETIES	TSDR	LIVE

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Goods and Services	IC 041. US 100 101 107. G & S: Arranging and conducting educational conferences of a scientific/engineering character in conjunction with international materials research. FIRST USE: 19910311. FIRST USE IN COMMERCE: 19910311
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Renewal	1ST RENEWAL 20111201
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2.2 Words from founding scientists

The Birth of IUMRS By Prof. Siffert

Professors Abdelilah Slaoui and Paul Siffert

The 20th Anniversary of the creation of IUMRS was celebrated during the 2011 conference in Nice. However, the origin of international cooperation in the field of advanced materials goes back to the early 1980s, when the MRS President Woody White agreed that a similar society should be established in Europe, based on identical values to those of MRS, especially the multidisciplinary approach. During a Fall Meeting in Boston this agreement was finalized which led to the first E-MRS conference in 1983. During this meeting the President of the largest national material society in Europe entered the room crying that the initiative was not acceptable: as the national structures could solve all the problems. We had to push him out of the room!

Progressively the multidisciplinary approach of the Boston MRS conference attracted more and more people especially from Asia.Several countries there were interested in creating similar organizations to the MRS.Before the agreement to inaugurate the "International Materials Research Community" was reached rather long and difficult negotiations were necessary, which, because the political tensions in certain areas were still very strong at the time, required all the tact and diplomatic skills of Woody White and RPH Chang. Finally, with the very good will of the delegates success was achieved and IUMRS was born: scientists are always in advance of the political interests。Now in the globalized world the materials community is united throughout the world, but again remember the scientists took the first steps in 1991, largely well ahead of the politicians!

I hope that we will agree on new ambitious objectives to help solve the major problems facing the world. It is evident that materials play the essential role in finding the solutions for the world's energy demands, water supply and the control of CO_2 in the atmosphere.

Paul Siffert
IUMRS Founding President
August 2019

◎ Paul Siffert, EMRS, EURORAD, Scientific adviser to EURORAD; General Secretary, E-MRS Headquarters. https://www.european-mrs.com/about/executive-committee

The Single IUMRS Thread by Dr. Elton N. Kaufmann

Dr. Elton N. Kaufmann

A dry enumeration of 30 years-worth of facts and figures or a little insight into the founding and continuing spirit of the organization, that is the choice faced by those of us who would contribute to this anniversary opus. But a false choice it is. There is a constant and consistent thread that connects all IUMRS events from before its birth to today. That thread is the recognitionand pursuit of multidisciplinary materials R&D. From the 1973 founding of the Materials Research Society (MRS) in the USA as an alternative to single-disciplinesocieties that had yet to accept the multidisciplinary ethos to the subsequent rise of similar societies in Europe (1983), Asia (1989), and Latin America (1990), the advent of the IUMRS in 1991 was an inevitable next milestone withinthe burgeoning recognition of how advanced materials research is actually pursued.

At the heart of multiple IUMRS successes over the intervening years are not the people or the structures of these regional organizations, even though those attributes have been crucial elements, but the core is and has been since the beginning the conferences that these societies produce. Once experienced, those multitopic, multidisciplinary symposia become participants' most favored and productive venue to deliver their results to a broad community and to access the advances of others. I contend that it has been the single motivating force behind the propagation of the

MRS philosophy globally and that it will continue to be the raison d'etre for IUMRS.

While staying centered around that core mission with three conference series dating back to the early days, some innovative excursions have been pursued. A conference series that explicitly focuses on next-generation researchers, not only as attendees but also as organizers, has been an exciting addition. Promotion of a series of World Materials Summits that connect the R&D community to industry and government policy makers has provided a vital service. Early in this century, A hybrid newsletter-cum-technical-notes print publication demonstrated over a five-year span a mode of communication that remains cited in the vitae of its worldwide authorship. Now, IUMRS cooperates with a relatively new archival journal whose impact factor rises year after year. Under the aegis of IUMRS, several awards are recognizing multi-continent collaboration, global community leadership, and young researchers. In all cases, one or more IUMRS member societies lead and support these ongoing activities.

It is rewarding to enjoy and reassuring to acknowledge the cross-cultural, multi-discipline, highly collegial collaboration within and among the IUMRS member societies. Perhaps not a unique phenomenon in the context of the larger global scientific community, but in its own way, IUMRS epitomizes how political divisions and national borders can be bridged by people who share a common training and approach to analysis and problem solving. Not a bad example for a world faced with energy, environmental, and sustainability challenges.

Elton N. Kaufmann
Emeritus Scientist, Argonne National Laboratory
Member of Mrs, MrssAndEmrs
Iumrs Chief Advocacy Officer, 2015-Present
Chairperson, Iumrs Commission on Development, 2015-2016
Iumrs Facets Founding Executive Editor, 2001-2005
Iumrs Secretary, 2001-2002
Chairperson, Iumrs Commission On Publications (1998 –2006)

IUMRS History by John Baglin

1.Foundations:

John Baglin
Senior Scientist, IBM, USA

1984/1985: An "International Committee" was informally established, to explore a future formal development of a global Materials Research organization. Leaders of the effort included Woody White, Bob Chang, Elton Kaufmann, Masao Doyama, Paul Siffert, and ot hers. "The purpose of the Committee is to serve as a vehicle for communication between Societies concerned with Materials Research - not as a governing body, but rather to foster interaction among autonomous regional peer Societies in various parts of the World."

1984-89: With MRS encouragement and advice, MRS organizations formed independently in Europe, Japan, China, Mexico, Taiwan, India, Australia, and others also developed.

1990-91: Formal establishment of the International Union of Materials Research Societies, with formal incorporation in Pennsylvania, and accounting and banking services generously provided by MRS. The new Union was specifically to be modeled on IUPAP and IUPAC. Founding members were MRS, European-MRS, Chinese-MRS, MRS-Mexico, MRS-Taiwan, MRS-India and Australian-MRS.

2.Development and Progress:

Adhering Bodies: The Founding members were since joined by African-MRS, Brazil-MRS, MRS-Indonesia, MRS-Japan, MRS-Korea, MRS-Russia, MRS-Singapore, and MRS-Thailand.

Institutional Affiliates: This category of membership was established in 2002. It was intended to provide a path of communication and collaboration between institutions and organizations with Materials Research interests all over the world. Affiliates included national laboratories in the U.S. and in Europe, and research institutions in Asia. This program has been terminated due to poor participation.

Meetings: Series of International Technical Meetings that are hosted by individual Adhering Bodies, with IUMRS endorsement and cooperation have become fixtures in the Materials Calendar. They include ICEM, ICAM, ICA, and ICMAT.

Awards:

1.The Sômiya Award for distinguished international collaborative Materials Research has become a prized international landmark.

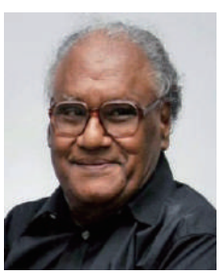
2.The Young Researcher Award is presented to young (under 40) researchers every two years since 2012 during the International Conference of Young Researchers on Advanced Materials (IUMRS – ICYRAM).

Publications: The Quarterly Newsletter "Facets" was first published in 2002, as a high level print journal presenting news and reviews representing the status of the Materials Research enterprise, worldwide. It was developed and edited by Elton Kaufmann, at his offices at Argonne National Lab. "Facets" developed a substantial subscribership, and it also served as a flagship publication for IUMRS and as a member benefit for Adhering Bodies and Institutional Affiliates. Its publication was suspended in 2006, due to cost of production, with the intent to create a fully electronic equivalent, to more effectively serve the broad international community.

ICSU Membership: In 2005, sensing its readiness for this elevated international involvement, IUMRS made formal application for Full International Scientific Union Member status in ICSU (The International Council for Science). ICSU has just 29 such International Union Members. At the ICSU General Assembly Meeting that year, the IUMRS application was accepted with acclaim. IUMRS has since participated in current ICSU activities, and had developed specific efforts to contribute the Materials perspective in global study projects that ICSU conducts. IUMRS considers that it has a unique and substantial role to play in such top-tier studies of globally important science issues. In 2018, ICSU merged with the International Social Science Council (ISSC) and formed the new International Science Council (ISC). The Council is the unique global representative body of both the natural and the social sciences, with a select global membership of 40 international scientific unions (including IUMRS) and interdisciplinary science bodies, and over 140 national and regional scientific bodies.

John Baglin has had various supporting roles through the above history. They included participation in the founding committee discussions, the development (and subsequent updating and archiving) of the IUMRS Statutes and Bylaws, Chair of the IUMRS Membership Affairs Committee, Second Vice President, Secretary, and ICSU Liaison. He also served briefly as Executive Editor for Facets and is still smiling as his photo will testify.

2.3 Words from IUMRS volunteers



Professor C. N. R. Rao

Many years ago, in the mid 1980s, when I was a member of the Executive Board of ICSU, I remember the discussion about the possibility of inducting a new Union devoted to materials research as part of the ICSU". I was the only member who knew about IUMRS, having been involved in early discussions about this matter. I, of course, strongly supported the importance of materials research and the need to include IUMRS in the ICSU family. I am very delighted that happened.

In the last few years, it has been a pleasure to see IUMRS becoming a global influence in materials research. The meetings under the auspices of the IUMRS have attracted wide attention of scientists and engineers from all over the world. In India, IUMRS is highly reputed as an important scientific union. I have no doubt that IUMRS will continue to contribute to materials research

in a big way and be an influence in all the countries of the world.

It is particularly important that IUMRS sponsored meetings are held in various countries. It could offer sponsorship to more regional and other national meetings. I am a great supporter of IUMRS and as I am growing old, I can foresee that it will continue to be an organization of great value for years to come.

◎ C. N. R. Rao, Honorary President & Linus Pauling Research Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, India.

http://www.jncasr.ac.in/cnrrao/index.html

Professor Masahiro Yoshimura Yoshimura

Birth and Growth of MRS-J and IUMRS. Materials Research Society (MRS) was established by Professor Rustum ROY (Penn State University) et al. in 1973 in the US. It covers Physics, Chemistry, Biology, Polymer & Plastics, Metallurgy, Semiconductor, Ceramics Composites and hybrids. This novel concept of an integrated approach to materials topics investigation grew so quickly that the development of MRS surpassed all previous individual societies. The European MRS followed this lead in 1983.

When Professor Robert (Bob) P.H. CHANG (Northwestern University) visited Professor Masao DOYAMA (University of Tokyo) and Professor Shigeyuki SÔMIYA (Tokyo Institute of Technology) in Japan in 1986 to discuss the possibility of establishing the MRS-Japan, they considered seriously on how to establish it together.

First, they organized an International Conference for Advanced Materials (ICAM). The event was held in 1988 from May 30 to June 3 at Ikebukuro Sunshine City, Tokyo and sponsored by Nikkan Kogyo Shinbun (Daily Industrial News) Co. Ltd. It succeeded in attracting more than 1,500 participants from 34 countries. I, the author attended as one of the Organizing (secretary) members. However, I had to practically serve as the representative Secretary because the Organizing Chairs (Professors Doyama and Sômiya) were too busy engaging in building a new private university, the Nishi Tokyo University of Science and Technology after their retirement in March, 1988; and Official General Secretary Mr. Takayoshi AGATA, KSP (Kanagawa Science Park) and Nikkan Kogyo Shinbun's members had encountered many challenges in organizing this International Meeting.

For example, after getting the agreements from Professors Doyama and Sômiya, I had made on-the-job-training in "How to organize an International Conference" available to their members, starting with "How to write 'Call for papers' in English", then "Assembling of Session Chairs' requests to manage to correspond to the Organizing Committee". Even the conference used Simultaneous Translators via a famous Simul Company, where they hired many graduate students who took English Courses. I had to conduct seminars on Technical Terms in Materials Science & Engineering for them. During those seminars, I learned to recognize the major differences between Japanese Language and English Language: Logic and Structure in Sentences, Pronunciation (Accents & Intonations and Voice Making & Blessing), etc.

Based upon the great success of the International Conference, MRS-J (initial name AMSES: Advanced Materials Science and Engineering Society), was established on March 16, 1989, with Professor Doyama as President, Professor Sômiya as Vice President, and Mr. Agata as Secretary. AMSES held three Meetings in 1989 and three meetings in 1990. In 1990, AMSES changed its name to MRS-Japan (MRS-J). Profs.DOYAMA, SÔMIYA and Masaki HASEGAWA (Tokyo University) were the "first" generation members of MRS-J, then Professors Ryoichi YAMAMOTO (University Tokyo), TisatoKAJIYAMA (University of Kyushu) and myself, Masahiro YOSHIMURA were the "second" generation members. Today, MRS-J is continuing its expansion in membership and operation.

As for IUMRS (The International Union of Materials Research Societies), the success of the above-mentioned International Conferences led to a new paradigm of operation.On November 30, 1989 during MRS's Fall Meeting in Boston, International Materials Research Committee (IMRC) was established with attending representatives from USA, Japan, Taiwan, Europe, China, India, Australia and Mexico when they elected Professor Bob Chang as the Chairperson, Professor Paul Siffert as the Vice-Chairperson, Professor Rod Ewing as the Secretary and Professor

Sômiya as the Treasurer. They established IUMRS in 1991, with members from USA, Japan, Taiwan, Europe, China, India, Australia and Mexico. And now, Korea, Singapore, Russia, Brazil, Thailand, Indonesia and Africa, have also joined.

Professor Bob Chang thanking Professors Sômiya and Doyama for their lead in organizing the 1988 ICAM in Tokyo, Japan.

Since 1990, IUMRS has organized ICAM (International Conference for Advanced Materials), and ICEM (International Conference for Electronic Materials) in alternate years. In addition, ICA (International Conference in Asia) is held every year. Thus we, MRS-J believes that the 1988 Tokyo Conference was the first IUMRS activity and up to now MRS-J has organized nine IUMRS Meetings.More details are available on the IUMRS Website: iumrs.org.

As described above, the Key-person of establishment of MRS-J and IUMRS was Professor Bob Chang, who was born in Chongching, China, from Chinese parents who were educated in Japan. After WW-II, Bob's family moved to Japan in 1952 via Shanghai and Hong Kong. After finishing high school, Bob went to USA where he received a B.S. in Physics from MIT and a Ph.D. in Astro Physics from Princeton University. He joined MRS in 1984 while working at Bell Labs, and became its president in 1989 when he was a professor at Northwestern University. He was acquainted with Professor Doyama who was working at Argonne National Lab. After getting his Ph.D in Physics from University of Illinois, Professor Doyama returned to Tokyo University as a professor. Professor Sômiya spent his graduate student years at Penn State University, where Professor R. Roy was one of his mentors. Professor Roy was also one of my mentors since the 70s when I was a Post-Doc at MIT. I have worked with Professor Sômiya since 1978. Our cooperation had continued until his retirement in 1988, and even after my promotion to a full professorship in 1985.

Thus, many major activities that I took partin over the years had been related to MRS-J and IUMRS.I experienced being in the positions of MRS-J President, Organizing Chairs, Advisory members, Keynote/Invited speakers in IUMRS Conferences. I have learnedand gained substantial experience in matters relating to Science and Technology, Human Relations, Cultures and Histories, as well as Nature and Human, which could be so beautiful and gentile, and also very confrontational. As a lucky person who appreciates all of the members in IUMRS and associated people, I would like to transfer all of my knowledge and experience to future generations of researchers and leaders in materials research and education.

Professor Masahiro YOSHIMURA

Department of Material Science and Engineering, National Cheng Kung University, Taiwan.

◎ Masahiro Yoshimura, Professor, Department of Material Science and Engineering, National Cheng Kung University, Tainan, Taiwan.

https://ceramics.org/award-winners/masahiro-yoshimura

Some memories and thoughts from an IUMRS long-time volunteer

Professor Jim Williams

I first heard about the push toward internationalizing MRS at a Boston MRS conference in 1984 from Woody White and Bob Chang. The first step was to establish MRS-like societies in different countries and regions of the world. Several members of the international community, who were regular attendees at MRS and E-MRS meetings, were given the challenge of achieving this task. This group of material scientists came together at MRS meetings as the International Committee for Materials Research to report on progress towards this goal. By 1988, there were 7 countries that had established MRS societies, in addition to the US and Europe, and IUMRS was launched with the first interdisciplinary IUMRS meeting (ICAM/ICEM) held in Tokyo, hosted by MRS-Japan. Since that time IUMRS has developed and become the key international Union for materials scientists and engineers. Although there has been some testing time in the development of IUMRS and some difficulties getting the General Assembly to make decisions that fostered growth and a revenue stream, it has been an enjoyable ride.

Since its inception, IUMRS has been a little like a family, with many life-long friendships forged along the way. Most IUMRS activities have revolved around its conferences, initially its technical meetings ICAM and ICEM.Indeed, these conferences were the focus for scientific interactions, networking and socializing, as well as the venue for the Union's General Assembly and Executive meetings.Two initial global initiatives of IUMRS involved establishing a world material network for students and young researchers, and a platform to engage with governments across the globe. The first initiative was led by Bob Chang, and the second, through the IUMRS publication 'Facets' by Elton Kaufmann. Both initiatives have had their successes but sustaining the activities has been a challenge. Such efforts need to be re-invigorated in the future: that is, aiming for a young researcher network that is self-sustaining and a 'go-to' entity for all young researchers; finding ways of truly engaging with policy makers so that they view IUMRS as one of their 'go-to' organizations in developing science policy and planning.

A particularly successful IUMRS-organised workshop was held in Hawaii in 1998 and focused on establishing collaborative links between countries, materials education, young researcher networking and engagement with policy makers. Bob Chang was the initiator and Chair, and the US NSF provided funding. Many policy makers attended this workshop as well as materials researchers, educators and industry leaders. Since that time there have been forums to discuss these topics, key among them the conference series 'World Materials Summit'. The WMS was an initiative of Paul Siffert and E-MRS and has been very successful in providing a forum for addressing how materials science and engineering can contribute to solving major global issues such as environmental pollution, water quality, clean energy, sustainable manufacturing and more recently, climate change. A mix of scientists, industry leaders, young researchers and industry leaders were the participants of these meetings.The challenge for IUMRS is to more effectively communicate the outcomes or reports of these workshops to global leaders.

Engaging with young researchers and students has been a particular direction for IUMRS but has been challenging. For example, the union's commissions and committees have traditionally been mostly the domain of senior scientists, many near or beyond retirement age. As a result, IUMRS doesn't give the impression of an organization for young scientists and its social media presence, the domain of the young scientists, is poor at best. However, a ray of hope has been through the establishment of a conference for young researchers, ICYRAM, which was initiated by BVRChowdari and MRS Singapore. In this forum, students and young researchers can take control of organizing conferences for themselves, with events and workshops that they need. It is important that IUMRS builds on this initiative to more effectively engage with young scientists who are our future, to integrate them more effectively into IUMRS commissions and committees: that is, to give them a strong voice in our global materials community.

IUMRS has had several strategic planning meetings, most associated with GA and EC meetings. I can remember such a meeting in Singapore for a day and a half in about 2005 that came up with a number of significant opportunities for the future, but unfortunately none of them were followed through in any detail and these opportunities were lost. IUMRS cannot afford to do this in the future. With the establishment of the new head office of IUMRS in

China then Singapore, along with hopefully vibrant regional IUMRS offices, I am optimistic for the future. However, we must all pull in the same direction and involve our young scientists in our future planning to be truly successful.

2.4 Brief Introduction of founding Adhering bodies of IUMRS

1. From Prof. R. P. H Chang: Founding Members

The founding members of IUMRS were societies from the United States (MRS), Europe (E-MRS), Japan (MRS-J), Mainland of China (C-MRS), Mexico (Mexican-MRS), MRS-Taiwan, India (MRS-I) and Australia (A-MRS). These were joined later by MRS-Korea, MRS-Russia, MRS-Singapore, MRS-Brazil, MRS-Argentina, African-MRS and, most recently MRS-Indonesia and MRS-Thailand.

2. Introduction to Founding Adhering Bodies

United States (MRS)

The Materials Research Society (MRS) was established in 1973 by a visionary group of scientists who shared the belief that their professional interests were broader in scope than existing single-discipline societies and that a new interdisciplinary organization was needed.

Today MRS is a growing, vibrant member-driven organization of more than 14,000 materials researchers from academia, industry and government, and is a recognized leader in the advancement of interdisciplinary materials research. Headquartered in Warrendale, Pennsylvania (USA), MRS membership now spans over 90 countries.

MRS members hail from physics, chemistry, biology, mathematics and engineering—the full spectrum of materials research—and they choose MRS because it is important to their work and their careers. In MRS, they find an environment for collaboration and open exchange of ideas across all scientific disciplines. Where students and Nobel Laureates come together to share their research.Where multilateral projects are a global enterprise.And where the ultimate goal is to advance materials that improve the quality of life.

The tremendous growth and success of our society is the result of member input and the energetic efforts of many MRS volunteers. They offer their precious time, their spirit, their expertise and their unique perspectives for the betterment of the materials community worldwide. These volunteers, together with our exhibitors, sponsors, partners and headquarters staff, are the framework upon which our society will continue to flourish.

Approximately 50 percent of MRS members, more than 40 percent of meeting attendees, more than 50 percent of authors in MRS publications and more than 50 percent of MRS website visitors reside outside the United States. This international character is also reflected in MRS leadership. Recent MRS boards have consisted of individuals with diverse backgrounds and perspectives reflecting many parts of the globe, including Africa, Asia, Europe, the Middle East, and North and South America. The renewal of the president every year and the board of directors every three years, based on election by the members, promotes participation from all over the world, bringing new ideas and expertise to advance our vibrant society.

Europe (E-MRS)

Founded in 1983, the European Materials Research Society (E-MRS) now has more than 4,000 members from industry, government, academia and research laboratories, who meet regularly to debate recent technological developments of functional materials.

The E-MRS differs from many single-discipline professional societies by encouraging scientists, engineers and research managers to exchange information on an interdisciplinary platform, and by recognizing professional and technical excellence by promoting awards for achievement from student to senior scientist level.

As an adhering body of the International Union of Materials Research Societies (IUMRS), the E-MRS enjoys and benefits from very close relationships with other Materials Research organizations elsewhere in Europe and around the world.

Each year, E-MRS organizes, co-organizes, sponsors or co-sponsors numerous scientific events and meetings. At

the heart of the meetings portfolio are the E-MRS Spring and Fall Meetings. The major society conference, the E-MRS Spring Meeting, is organized every year in May or June and offers on average 25 topical symposia. It is widely recognized as being of the highest international significance and is the greatest of its kind in Europe with about 2,500 attendees every year. Based on the same model, the E-MRS Fall Meeting, is organized every year in September and consists of 20 topical symposia. Both conferences are augmented by an exhibition of products and services of interest to the participants.

Each symposium publishes its own proceedings that document the latest experimental and theoretical understanding of material growth and properties, the exploitation of new advanced processes, and the development of electronic devices that can benefit best from the outstanding physical properties of functional materials.

Chinese MRS (C-MRS)

The Chinese Materials Research Society (C-MRS) was established in 1991. It is a national academic and non-profit social organization voluntarily formed by individuals and units engaged in materials research. It is a constituent of China Association for Science and Technology (CAST) and members of the International Union of Materials Research Societies.

The C-MRS has 9 subordinate working committees, 25 branches, 200 unit members and more than 8000 individual members. It is guided by the seventh Council, Li Yuanyuan and Wei Bingbo serves as the president, while Han Yafang serves as the secretary-general.

The society was published, Progress in Natural Science: Materials International, Rare Metal Materials and Engineering, Journal of Materials Science & Technology, Materials China, and other professional academic journals.

The C-MRS organizes the China Congress on Materials, the International Seminar on Advanced Material Research, the Symposium of National Youth Materials Science and Technology, and other academic activities.

The society has also established awards including C-MRS Science and Technology Award, C-MRS Contribution Award, and C-MRS of Excellent Doctoral Dissertation Award, to reward outstanding talents in the field of materials research.

MRS-Japan

Since its establishment and in cooperation with related organizations, MRS-J has organized IUMRS-ICAM93 (Ikebukuro, August 1993), IUMRS-ICA97 (Makuhari, September 1997), MRS-J 10th Anniversary symposium (Tokyo, July 1999), IUMRS-ICAM2003 (Yokohama, October 2003), IUMRS-ICA2008 (Nagoya, December 2008) and MRS-J 20 th anniversary symposium as well as approximately 50 symposia and conferences. IUMRS-ICA2008 became a large-scale conference with more than 1800 participants. The next IUMRS-ICEM2012 will be held in Yokohama in September of 2012. Periodic publications include MRS-J News and Transactions of the Materials Research Society of Japan. As a founding member of IUMRS (International Union of Materials Research Societies), commitment to the promotion of international activities is one of the main characteristics of our organization.

MRS-J considers that science and technology have become too fragmented and too specialized. This organization aims at contributing to the development of material science and technology through their reintegration, bringing the academic theory to industrial and social applications, and disseminating the knowledge in materials development, processing and application technologies, from the experts in each field to the citizens and policy-makers, providing a forum for discussion of all issues related to materials, and offering research results and data as common property. MRS-J strives to become a forum to discuss all issues in a timely manner in a multidisciplinary and interdisciplinary way. This can be only achieved through the active participation and support of many people from various fields, for which we are deeply thankful.

MRS-Korea

The Materials Research Society of Korea has been established on February 23, 1991 under industry/university/institute cooperation in order to contribute to the development of the domestic new material research using wide

variety of knowledge in physics, chemistry, medicine, materials science, etc. as well as activation of industry-university technology exchange in materials science and engineering fields. Under the above purpose of establishment, the society has published the first edition of its journal in June 1991 which is now listed in SCOPUS and E-SCI. There were numerous active societies about materials related such as metal, ceramics and polymer. However, MRS-K is one of fast growing societies in Korea. The materials used in the modern advanced industries require high performance, multi-function and accuracy due to its complex manufacturing process. In order to respond to the demands of these current issues, the Materials Research Society of Korea (MRS-Korea) is continuously growing under support by the academic world and the industry for the development of the material industry. The society has been hosting two conferences (spring and fall) every year and an international conference of IUMRS and we hope to contribute to the growth of the technology and study of the materials science and engineering and to exchange the friendship among members of the society.

Mexican-MRS

The SMM is a group formed by participants in the International Materials Research Congress (IMRC), both Mexican and foreign, who carry out activities aimed at disseminating the research work they carry out, the academic development of students in science, technology and engineering materials, as well as the proper use of science and technology for the benefit of humanity.

The Mexican Materials Society's mission is to serve as a meeting place for academics, professionals, industrialists and institutions interested in the advancement of Materials Science and Engineering, providing forums where scientific and technological advances in the field are exposed. Similarly, the SMM promotes research, technological development, teaching, dissemination and dissemination activities in order to raise interest and culture in science, especially in the field of Materials Science and Engineering.

To be a community in constant development, with members who generally promote the improvement of the quality of life of the population, particularly in Mexico, through the activities and collective initiatives of its members.

MRS-Taiwan

The Materials Research Society-Taiwan (MRS-T) was founded with the official name of "The Chinese Society for Materials Science (CSMS)" by Chih-Houng Lu of National Taiwan University, James C. M. Li (then at Edgar C. Bain Laboratory and later moved to University of Rochester), and some other mechanical and metallurgical pioneer engineering people in September, 1968. Prof. Lu, who was educated and trained as a metallurgist in Japan and served as the president of National Taiwan University during August 1946 to April 1948, was elected as the first president of the society. The Chinese name of CSMS has been used domestically since it was founded. However, as a founding adhering body of IUMRS, the name of "MRS-T" was adopted to participate in international activities in order to differentiate from C-MRS. It was not until 2008 that the official English name of CSMS was changed to MRS-T to avoid confusion.

Since there has been a fast growth and expansion of high-tech industries, such as IC, IT, TFT-LCD, LED, solar cells, etc. in Taiwan since the 1980s, there is a high demand of manpower in materials science (MS). This leads to expansion of MS programs in the universities. In addition to materials science and engineering departments, most traditional chemical engineering departments have been recently transformed to chemical engineering and materials science departments to train students with materials science knowledge. This makes the number of MS-related departments increasing to more than 50 in Taiwan, probably the highest density in the world. Currently, MRS-T has more than 1600 individual members and nearly 100 group members. It has served as a platform to link industry, academia, and government together to promote the R&D of materials science in Taiwan. Since it was founded, MRS-T organizes an annual meeting every year. For example, MRS-T commemorated its 40th anniversary in 2008. More than 1200 papers (poster and oral) were presented, and more than 1500 people participated in the meeting.

In addition to publishing professional books, magazines, journals, and web-based courses related to materials

science, MRS-T has also been publishing an international journal “Materials Chemistry and Physics (MCP)” in co-operation with Elsevier since July, 1992. The wide distribution and high impact of MCP can be appreciated by the growth of impact factor from 0.78 in 2000 to 2.015 in 2010 and over 4000 submissions in the year of 2009. MRS-T has been closely working with IUMRS to promote international materials R&D activities. For instance, MRS-T has hosted ICA-1994, ICEM-1994 and ICA-2004, and will host ICA-2011 this September. It also plans to organize ICAM and ICEM in the near future.

MRS-India

The Materials Research Society of India came into existence in February 1989, thanks to the farsighted vision of Prof. C N R Rao. Prof. Rao functioned as the first President and laid the foundation for its impressive growth over the past decade.

MRSI functions through 18 Regional Chapters and 16 Subject groups. MRSI is supported by individual members and institutions who will be patrons of the society. Its current membership includes 2745 Life members, 07 Annual members, 156 Honorary members and 83 Patron members amounting to a total of 2991 members.

MRSI recognizes contributions to materials research through Distinguished Materials Scientist of the year Award, MRSI-ICSC Superconductivity and Materials Science Senior Award and MRSI Distinguished Lecturership Award. There are number of other prizes including the MRSI Medal Lectures. Every February an annual technical meeting is held.

The hosting of IUMRS-ICA 98 meeting at Bangalore during October 13-16, 1998 was a major activity of MRSI. The Conference had 22 Theme Symposia and was held in 7 parallel sessions. More than 150 invited talks were delivered and nearly 700 contributed papers were presented. The proceedings of the Conference, consisting of the invited talks was published as a special issue of Bulletin of Materials Science.

Another major activity was the hosting of IUMRS-ICAM 2007 meeting at Bangalore during October 8-13, 2007. The conference had 23 theme symposia, 6 plenary lectures and 250 invited talks. Around 1100 delegates attended the conference.

The MRSI has been regularly publishing the MRSI Newsletter. This is a quarterly publication.. Several issues have been brought out successfully for the past ten years.

MRSI co-sponsors the publication of Bulletin of Materials Science (BMS) published by the Indian Academy of Sciences.

MRSI is a founding Adhering Body of the International Union of Materials Research Societies (IUMRS) and participates in the international arena of materials research.

Australian-MRS

History: A-MRS was a founding adhering body within IUMRS in 1991. It began as an entity some 3 years earlier through extensive discussions between existing materials research-related societies in Australia as to the best model for A-MRS. It was decided that it should not be a separate society in Australia but an umbrella organisation that co-ordinated materials activities across around 10 national materials societies. In its early years, it took leadership in sponsoring interdisciplinary materials conferences and workshops between two or more of the national materials societies, as well as providing a conduit between the local societies and IUMRS. In the mid to late 1990s, A-MRS lobbied the government to establish funding for materials networks, principally an industry network that linked Australia’s materials researchers more effectively with industry.

A Future Materials Network was funded by the Federal Government in 2002 and has run a number of interdisciplinary industry events and workshops (most often co-sponsored by A-MRS) across the country, with both industry and researcher presentations to broad audiences. Another network that was proposed was to provide special career and other opportunities for materials students and early career researchers across Australia. In late 2004, two such networks were funded by the Federal Government: The Australian Research Network for Advanced Materials (ARNAM) and Australian Research Council Nanotechnology Network (ARCNN).

These networks have formed a very important role for A-MRS since this time:

i) providing an interactive web-based network amongst young researchers across the country, including databases containing researcher profiles and an institutional materials research facilities database across the country

ii) providing a funding scheme to support students and young researchers to access facilities and undertake col laborative visits both nationally and internationally

iii) running interdisciplinary workshops specifically for students and young researchers, including industry days (with Future Materials) and grant writing events

iv) running an international nanoscience and nanotechnology conference (ICONN) in Australia every two years.

A-MRS has also promoted international materials workshops in recent years as well as successfully bidding for the IUMRS's International Conference on Electronic Materials (held in Sydney in 2008).

2.5 IUMRS publication- Facets

As an IUMRS official publication , Facets was a quarterly newsletter/technical-notes published in print from 2002 through 2006 (i.e., 5 years). As the editor-in-chief of Facets , Dr. Elton Kaufmann made great contribution to Facets publication. Unfortunately the cost and the increasing popularity of purely electronic newsletters led to the discontinuing of Facets. Facets is still cited by many authors in their CVs now. Some highlighted articles are shown as follows.

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INNOVATION

Industrial Research and Development in a Changing World: Leadership through Innovation and Technology

Claus Weyrich

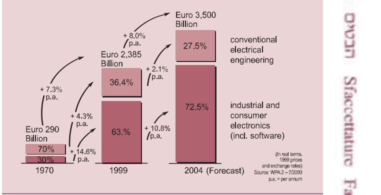
Global competition, especially in the area of electronics and electrical engineering, is characterized by faster innovation cycles, changes in production processes and in industrial structures, growing cost pressure, and increasing price erosion for products, systems, and services. The resulting pressure on industry forces corporations to renew themselves continuously. Every organizational unit, including the research and development (R&D) department faces this challenge.

Evolving Global Electrical Industry Thrives on Innovation
The global electrical industry, which enjoys an annual growth rate of 7–8%, is undergoing continual technological and structural change. A breakthrough innovation, microelectronics, has led to massive growth in information and communication technologies in both industrial and consumer electronics. These areas have become the dominant segment of the market with a growth rate of more than 10% per year, a figure well above the growth rate of conventional electrical engineering markets.

"The winners will be those that master the synergy…"

Future development of the electrical industry will be characterized by:
- Continued progress in microelectronics and software;
- Ever-shorter product and system cycles;

Go to page 3 (*Industrial Research… continued on page 3*)



Microelectronics have become the dominant segment of the electrical market with a growth rate of more than 10% per year.

PERSPECTIVES

One Hundred Years of the Nobel Prize: Its Relevance for Society

Anders Bárány and Hermann Grimmeiss

When Alfred Nobel died on December 10, 1896, he bequeathed his fortune to prizes to be awarded "to those who, during the preceding year, shall have conferred the greatest benefit to mankind" in five categories: physics, chemistry, physiology or medicine, literature, and peace. Four institutions were to bestow the awards: the Royal Swedish Academy of Sciences (physics and chemistry); the Karolinska Institute (physiology or medicine); the Swedish Academy (literature); and the Norwegian Nobel Committee (peace), a committee chosen by the Norwegian Parliament.

Nobel pointed out that "in awarding the prizes no consideration whatever shall be given to the nationality of the candidates, but that the most worthy shall receive the prize, whether he be a Scandinavian or not." This statement angered many, including the Swedish king, Oscar II, who would rather have had the Prize reserved

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A Letter from the Publisher

Dear Readers,

Why create a new publication dedicated to advancing the role of materials in global progress? The publishers of *IUMRS Facets* believe that communication and collaboration among international materials research, education, and technology groups is critical for the advancement of forward-thinking policies. *IUMRS Facets* offers a new forum for promoting the exchange of ideas and information and for inspiring the development of new research and policy initiatives.

As we enter this new millennium, the possibilities of science and technology have never been more fascinating or more globally significant. Collaboration among technical disciplines lies at the root of materials development, and such collaborations are becoming increasingly international in nature because of economic globalization and rising research costs. Researchers are probing more deeply than ever into the frontiers of materials, and accurate communication of the implications and applications of new findings has never been more important. *IUMRS Facets* is dedicated to reporting on materials-relevant policy and programs on an international scope and in areas where current periodical literature is lacking.

Our first issue devotes special attention to descriptions of programs, policies, and plans. Readers will find analyses of important developments in science and technology, perspectives from the industrial and nonprofit sectors, articles on the state of education in materials-related fields, editorial opinion, news, and reports on the activities of the IUMRS, its adhering bodies, and other materials-research-related organizations.

In the future, *IUMRS Facets* readers can look forward to interviews with science attachés from embassies around the world, articles by members of the science press, articles about innovative activities of materials-related societies, and a chance to respond by sending letters to the editor.

On behalf of the IUMRS, welcome to the first issue of *IUMRS Facets*. We hope you enjoy its contents and celebrate the spirit in which it was born.

Bob Chang
IUMRS General Secretary

Nobelists Stormer, Alferov, Bednorz and Heeger in Singapore with ICMAT 2001 officials A. F. Yee and C. F. Shih at left and B. V. R. Chowdari at far right… see story on page 10.

(*Industrial Research… continued from page 1*)

- Increasing services market connected with products, systems, and plants;
- Ongoing changes in value-added chains and "digitization" of business processes ("e-business");
- Continuing price erosion for products, systems, and services; and
- Accelerated globalization and competition spurred by deregulation and liberalization.

These dynamics pose new challenges to companies. The winners will be those that master the synergy among productivity, innovation, and growth, those that are willing to adapt to changes. Innovation, the catalyst for consumer benefit, productivity gain, and growth, is therefore the focus of entrepreneurial activities.

Innovation Requires Change
Innovation applies not only to new products, systems, or services (product innovations) but also to the value-added processes within a company (process innovations). Innovation may be either evolutionary or revolutionary. The former refers to incremental progress in products and processes, whereas the latter is often a result of a disruptive technological development (breakthrough innovation). Breakthrough innovations lead to completely new applications and may even create new industries. A reciprocal relationship exists between breakthrough innovations and change: Although such innovations provoke change, they are also often a result of change—changes in perspectives, established structures, or corporate culture.

"…we are faced with a decisive paradigm shift in industrial research."

For instance, a new perspective may create new values in the form of new benefits to the customer. Breaking up established value chains could lead to new businesses and create a new set of rules. Changes in human resource management may also promote innovations by allowing enough freedom to lateral thinkers or by rewarding their readiness to take risks. To be successful, it is not enough for a company merely to optimize a product or process; the objective must be to do it differently, not just better.

Today, more than 75% of all successful innovations are driven by the market. Selecting the right areas of growth is of decisive importance in any innovation planning process. Knowledge about the customer is an indispensable source of innovation, with the ultimate objective being to "help your customer to earn more money."

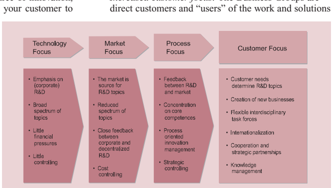
As a result, we are faced with a decisive paradigm shift in industrial research. The driving force is not just what is technically possible and feasible but also customers' future needs and the way in which these needs are met through innovative products, systems, and services. A holistic approach to future business scenarios is mandatory in planning technologies and innovation. Working methods are also changing: Interdisciplinary teamwork, systematic knowledge management, and working in partnership with customers, suppliers, and public research are gaining in importance. In addition, intellectual property, secured by patents, plays a decisive role in the competitiveness of a company.

Even when corporate R&D is the starting point for industrial innovation, incorporating new ideas within the company and successful market imple-mentation take the lion's share of work in the process as a whole. This in no way minimizes the significance of corporate R&D; rather, it emphasizes that the quality of interaction between the corporate departments and the business divisions is decisive in ensuring the effectiveness of an innovation, its benefit, and hence, its success.

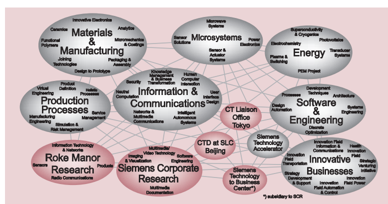
Research and Development at Siemens
In fiscal 1999–2000, Siemens spent US$5.6 billion globally on R&D, more than 7% of sales. About 96% of that amount was spent in the Business Groups and Regional Units and about 4% within the Corporate Technology Departments in Germany, Siemens Corporate Research in the United States, and Roke Manor Research in the United Kingdom. The mission of Corporate Technology is to secure the technological future and competitiveness of the company, through research, basic development, technological consulting, and patent work—in close collaboration with the Business Groups.

Taking into account the paradigm shift in industrial R&D, the organization, processes, and strategy of Siemens Corporate Technology have been developed to generate the maximum economic value for the company. With its vision "Network of Competences—Partners for Innovation," Corporate Technology focuses its strategy on seven elements:

- *Concentrating on strategically important core technologies:* About 40 technologies are clustered in six technology divisions and Siemens Corporate Research. Each core technology aims to result in technological leadership while demonstrating benefits to the future business of the Siemens Groups. These benefits are effectively promoted by Corporate Technology's requirement to have more than 50% of projects financed by the Siemens Business Groups concerned.
- *Internal networking and cooperation:* Many strategically important issues involve more than a single technology. To create optimum solutions for the Business Groups, Corporate Technology takes an interdisciplinary approach. Innovations in mobile information and communications, for instance, have been created by using several teams and pooled expertise on networks, software architecture, security, intelligent systems, and human-computer interaction.
- *Increased customer focus:* The Business Groups are direct customers and "users" of the work and solutions developed at Corporate Technology. Key account managers improve communication, reconcile the main R&D strategies, and transmit customer requirements to Corporate Technology. They act as heads of "virtual group laboratories," representing existing competences, channeling the Group's needs to the responsible technology departments, and initiating interdisciplinary projects for innovative business solutions.



The focus in industrial research and development is shifting from technology to customer needs.



Corporate Technology at Siemens AG forms a network of competences and partners for innovation.

- *Fostering entrepreneurship ("technopreneurship"):* Decentralized responsibility and an entrepreneurial spirit are needed to manage the complexity of a corporate R&D laboratory. Each core technology department represents a small enterprise responsible for its own budget, projects, acquisition of new projects, and building new competences. The reward system for managers and employees must support the change in mindset.
- *Systematic technology and innovation planning processes:* Roadmaps are used to extrapolate future technologies on the basis of current business, providing a sound basis for short- and medium-term planning. For the longer term, holistic scenarios are developed that take into account influences such as socioeconomic factors, the development of markets and industrial structures, and regional and cultural differences. By retropolation from these scenarios, new technological requirements and applications can be deduced. Extra-polation and retropolation are complementary, helping to design as consistent a "picture of the future" as possible.
- *Business incubation:* To translate innovative business ideas into rapid market success, Corporate Technology operates the Technology-to-Business Center in the United States, a subsidiary of Siemens Corporate Research, in cooperation with the Automation and Drives Group and the Siemens Technology Accelerator in Germany. Its mission is to:
  - Drive innovative technologies for emerging markets;
  - Combine technology and business orientation;
  - Generate new business through innovation both based in existing Siemens structures and also as a start-up foundation;
  - Provide support through seed money from business partners; and
  - Build a new innovative and entrepreneurial culture.
- *Cooperation with the international scientific community:* Effective and efficient cooperation between industrial research and international public research bodies is indispensable. With more than 500 cooperative partnerships, Siemens Corporate Technology pursues three major objectives:
  - Strengthen its own research activities;
  - Complement research in areas in which competence does not exist or needs to be developed; and
  - Recruit top junior research scientists and engineers, mainly in the field of natural and engineering sciences.

Conclusion
Global competition, particularly in electrical engineering and electronics, is characterized by the increasing dominance of information and communications technologies, shorter innovation cycles, digitization of business, enormous cost pressure, continuing price erosion, and the importance of knowledge management. The rules are changing, creating new challenges for companies and their research activities. Concentration on what creates economic value added for the company, increased customer and business orientation, and internal and external networking are the decisive elements of Siemens´s Corporate Technology strategy, coupled with policies that foster innovation, such as entrepreneurship, creativity, and a risk-taking culture. Innovation is also closely related to fun. This applies not only to what Edison referred as the 5% "inspiration" required in any inno- vative process but also to the 95% "perspiration" needed to turn an idea into a market success. This alone justifies the term "innovation."

"The rules are changing, creating new challenges for companies…"

Claus Weyrich studied physics at the University of Innsbruck. He joined Siemens in 1969 and has held several positions in Corporate Research and Development. He is now Senior Vice President and a Member of the Managing Board of Siemens.

(*Nobel Prize…* continued from page 1)

for Scandinavians. The King did not participate in the first award ceremony, held in Stockholm on December 10, 1901. Instead, the Crown Prince awarded the four "Stockholm Prizes," as they were known then.

During the five years from 1896 to 1901, the procedures and rules for the "Nobel System" were developed and set down in the statutes of the Nobel Foundation. One of the most important rules was the interpretation of Nobel's wish that the Prize should be given for work done "during the preceding year." This rule states that "awards shall be made for the most recent achievements in the fields of culture referred to in the will and for older works only if their significance has not become apparent until recently."

Another rule requires that the Prize-awarding institutions send letters all over the world asking for nominations every year. Today each institution sends out several thousand letters. The nominations must reach the Prize-awarding institutions by the end of January. The various Nobel Committees then meet to read the nominations and supplement them with their own. In 1901, for instance, the five members of the Nobel Committee for Physics jointly nominated both Wilhelm Conrad Röntgen and Philipp Eduard Anton von Lenard for the first Nobel Prize in Physics. But in a move that has been repeated several times during the 20th Century, the Academy did not follow the Committee's recommendation but voted for a single Prize to Röntgen alone.

More than 650 medals and diplomas have been awarded since 1901. Most of the Prizes are connected with fascinating stories of scientific, literary, and peace-forging activities. These histories reflect Man's attempts to find new knowledge and new ways to express cultural activities and to master the many conflicts that have taken place during the 20th Century. Many of the Nobel Prizes have had a direct bearing on societal questions, such as energy consumption, environmental pollution, medical care, and peace-keeping activities.

Since the beginning, the Prize-awarding institutions have discussed the exact definitions and boundaries of the prize areas. For example, pure astronomy is excluded from the Physics Prize as was pure theoretical physics initially. In general, the boundaries defining the area of physics have been more restrictive than those for chemistry. For example, the Chemistry Nobel was awarded to Ernest Rutherford in 1908. It is said that the only question Rutherford could not answer was why he received the Prize in

"…Nobel Prizes have had a direct bearing on societal questions…"

chemistry and not in physics! Later, however, it came to light that the reason was the attempt of an Academy member to emphasize the atomic concept by awarding Max Planck the Physics Prize and Rutherford the Chemistry Prize in the same year. But this attempt failed, and the Academy voted for Gabriel Lippmann instead of Planck. Planck had to wait another 10 years for his Physics Prize. Though the Physics Prize has been awarded 94 times, only nine or ten have been awarded to researchers outside of universities. As in other research councils, a topic frequently discussed is basic research versus applied research, often in "either/or" terms. A discussion in the Royal Swedish Academy of Sciences during the "timeout" created by World War I favored basic discoveries in physics over more practical technical inventions. In physics, basic discoveries are frequently made at universities, whereas practical technical inventions are more often the product of research institutes or industry.

Nevertheless, there have been exceptions. The 2000 Physics Prize was remarkable in many respects, not least because it was awarded to researchers active in both academia and industry. The Royal Swedish Academy of Sciences awarded the Prize "for basic work on information and communication technology." This work laid the foundation for modern information technology, and the Royal Swedish Academy of Sciences wanted to recognize this fact. The recognition also underlines another

To List or Not to List?

E. F. Krimmel, Board of Corresponding Editors

In context to this article on the Nobel Prize, should *IUMRS Facets* have provided a list of Nobel Prizes more or less subjectively ascribed to research in the materials sciences? This idea certainly did occur to us. We know that it is the prerogative of the Nobel Committees, and a delicate one at that, to delineate the subject areas of the Prizes under a long-standing charter—a charter that predates explicit recognition of multidisciplinary materials science. On the other hand, IUMRS, and therefore *IUMRS Facets*, intends to offer a worldwide platform for interdisciplinary communication concerning current and future research and development in materials science. Moreover, such a mission requires a view "beyond the rim of the plate," a view of the impact of such activities on society and humanity itself. As long as more than two millennia ago, Aristotle recognized that, far from being isolated, one's work interacts with the surroundings and the society in which it is embedded. He expressed this (*Statesmanship*, III, 6; loosely translated) as: "It is in the nature of man to be a social being."

Which of the Nobel Prizes was awarded for work only in the science of materials? Ultimately, which of these works materially benefited humanity? How would the individual laureate and how would our society evaluate this? For instance, few would object to the claim that Bardeen received his Nobel Prizes for work in materials science. But what of many of the other laureates where the relationship is not so obvious? On the other extreme, we could argue that materials are after all just forms of matter and Einstein's relation, $E = mc^2$, equates that to energy, which encompasses just about everything. Thus, any attempt to clearly specify which Prize is and which is not related to materials becomes problematic.

We therefore decided not to present a long list of Nobel Prizes considered to be related to work in materials science but rather simply to offer the Internet addresses where full information on the Prizes can be found:

- Nobel Prize Home Page *www.nobel.se*
- Physics Prizes *www.nobel.se/physics/laureates/index.html*
- Chemistry Prizes *www.nobel.se/chemistry/laureates/index.html*

After reading the citations associated with each laureate, readers can judge for themselves how much materials was in the Prize and how material the effect of the recognized work has been on our global culture.

well-known fact: Information technology is based on physics. This Prize clearly shows that one of the greatest achievements of mankind was made possible only through combined efforts in both basic and applied science and that any restriction to only one of these areas could have severely hampered this outstanding accomplishment.

Other examples in the history of the Physics and Chemistry Prizes relate to the courage to make mistakes. In some cases, senior scientists trapped in traditional thinking were not convinced by new concepts elaborated by their younger co-workers and therefore urged them to give up. The obstinacy of the "wild generation" finally, under the eyes of the despairing senior scientists, resulted in a breakthrough and later in a Nobel

"…greatest achievements… through combined… basic and applied science…"

Prize. Many scientists have been restrained from success by not realizing how constructive failures can be (as pointed out by Leo Esaki, Nobel Prize in Physics, 1973). Or, as Eugene Ionesco once observed, "It is not the answer that enlightens but the question." Rare is the research council willing to act on the basis of such a statement!

Recently, a new research laboratory was established in a European country. At the first board meeting, the chairman declared that the laboratory could perform any kind of research as long as it resulted in at least one Nobel Prize within the next ten years. He was asked why he was so fixated on the Nobel Prize. His answer was that he was not interested in the Prize as such, but an award would show that the laboratory had not just published papers but had made an outstanding contribution to the benefit of mankind. This statement reflects the conviction that the Nobel Prize is not only a prize but a recognition. It is based on a unique worldwide competition that makes Nobel laureates special and can imply a considerable amount of responsibility. This responsibility is sometimes exercised for better or worse.

A recent example of the willingness of Nobel laureates to live up to such expectations occurred when 80 Nobel laureates called for the continuation of stem cell research in a letter to U.S. President George W. Bush. The laureates are aware that there are legitimate ethical concerns about this issue, but they are nevertheless convinced that this kind of research should go forward. Those who are not in favor of stem cell research believe that this question is too important to be dealt with only by scientists, even if they are Nobel laureates. Whatever the outcome of this controversial issue may be, it clearly shows that Nobel laureates can perform an active role in society. With the means of communication available today, this kind of "Nobel action" will probably become more common.

The direction of the Nobel Prizes in the 21st Century is, of course, a question intimately connected to the future direction of science, culture, and societal conflicts. Since 1974, the deliberations of the Prize-awarding institutions are to be kept secret for 50 years. Thus, no information is available concerning possible policy discussions. Extrapolating from the Prizes of the last few years also gives no clear picture of future Nobel Prize policy. But one thing seems quite clear: The Nobel Prize enters the 21st Century with an exceptional *curriculum vitae*, which promises rewards to many interesting and important future developments in physics, chemistry, physiology or medicine, literature, and peace!

Hermann Grimmeiss received his degree in Physics and a Ph.D. in Physical Chemistry in 1957 from the Ludwig Maximilian University in Munich. In 1996, he retired as Head of the Solid State Physics Department and Dean for Research at the University of Lund. He is an APS Fellow and a member of several academies. He has also been awarded Bundesverdienskreuz 1 Klasse and The King's medal of 8th Dimension with blue ribbon.

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FACILITIES

Modern Neutron Beam Research Reactors and Their Applications in Materials Science

Wolfgang Gläser

Neutrons, the uncharged particles of matter, have become a versatile and powerful research tool in physics and material science. Since the first research reactors were built in the 1940s, thermal neutron beams have been used to study the structure and dynamics of condensed matter. Intense neutron sources are now in great demand for use in neutron

"…FRM-II is competitive with … research reactors worldwide."

scattering techniques, production of neutron-induced radioisotopes, and nondestructive neutron activation analysis for characterizing materials in both basic and applied research.

Research Requirements Necessitate New Reactors

The first research reactor in Germany, the Forschungs-Reaktor-München (FRM) at Garching, was commissioned in 1957 under the leadership of H. Maier-Leibnitz. During its 43 years of successful and safe operation, the FRM was often used for developing neutron physics techniques and applications. The reactor was shut down in July 2000 to prepare for the commissioning of a new neutron source, the FRM-II.

Scheduled to begin operation in 2001, the FRM-II is a response to the future scientific and technical requirements of a modern neutron source. These requirements also influenced the design of the Advanced Neutron Source (which was not built), the upgrade plans for the High Flux Isotope Reactor at Oak Ridge National Laboratory in the United States, and the upgrade program for the High Flux Reactor at the Institute Laue-Langevin in France (currently one of the most successful beam tube research reactors in the world).

The concept for the new compact-core reactor was developed at the Technische Universität München on the basis of more than 40 years experience in designing research reactors and optimizing beam port installations for neutron scattering techniques and other neutron applications. The Deutscher Wissenschaftsrat strongly recommended that the FRM-II be built as a future neutron source for Germany and a base for international cooperation. Construction of the new facility began in 1996 and was completed at the end of 2000.

Features of the New FRM-II Beam Tube Research Reactor

The usefulness of a research reactor is determined by its maximum thermal neutron flux and the available scientific instrumentation. With a thermal reactor power of only 20 MW but a neutron flux density of $8x10^{14}$ neutrons/cm^2 sec in the vicinity of the experimental beam ports, the FRM-II is competitive with higher power high-flux research reactors worldwide. This flux-to-power ratio was achieved through the design of the compact core. The core consists of a single fuel element with a diameter of 24 cm and an active height of 70 cm. Like other high-flux reactors, the FRM-II will be fueled with highly enriched uranium. It will be cooled with light water and is surrounded by a 2.5-m-diameter heavy water vessel that serves as the moderator. It offers a large useful volume for in-pile irradiation and test installations. In addition to cold and hot neutron sources, which extend the available thermal neutron spectrum to lower and higher energies, several optimized irradiation facilities have been integrated into the moderator tank. The useful experimental space around the cold neutron source will be doubled by an additional neutron guide hall with neutron guides and super-mirrors. The containment building is the first research reactor building that is protected against airplane crashes and other possible external impacts.

The 12 neutron beam ports will be used mainly for research on the structure and dynamics of condensed matter (crystalline and amorphous solids and liquids) using new and improved techniques. In addition to the microscopic and mesoscopic structures of technically promising materials, special problems of polymers and biological materials can be also be examined with these methods, such as the characterization of miniaturized biological systems on solid surfaces.

Innovative Instrumentation and Facilities Available

The first generation of the planned 30 research and scattering instruments is under construction with contributions from research groups at several German universities and the Max-Planck and Helmholtz societies. Many of these instruments are innovative. Much progress is expected from new techniques for high-energy resolution of condensed matter excitations using the spin echo technique with neutrons. For basic and applied studies of magnetic materials, high-intensity polarized neutron beams will be made available through the use of helium-3 filters and magnetic supermirrors. This technique may be applied to the characterization and optimization of magnetic layers on surfaces, for example.

Electron-positron pair production by neutron capture gamma rays will provide a new high-intensity source of positrons. It will be available for detailed surface and defect investigations of materials with slow positrons, opening a broad new field of positron applications for the characterization of materials.

Modern optimized irradiation facilities will produce special radioisotopes for medical and technical applications and for neutron activation analysis, one of the most sensitive nondestructive analytic techniques available. Impurity concentrations as low as 10^{-17} gram per gram in highly purified materials can be identified with this technique. A large-volume irradiation facility has been installed for applications of this technique to the analysis of liquids. The relatively new "prompt gamma" analysis technique can be realized with an intense neutron beam.

To enable homogeneous doping of large silicon crystals by neutron transmutation, a special irradiation facility (up to 8 inches in diameter) has been installed in the flat and low-background region of the heavy water moderator tank. This facility, which may be used for the homogeneous doping of semiconductor power devices, will be available for commercial use shortly after nuclear start-up.

Other applications under development concern the microscopic and mesoscopic characterization of new materials by means of neutron small-angle scattering, neutron reflectometry, and newly developed tomographic techniques with thermal and fast neutrons. Because of their penetration depth in samples, neutrons used with modern detection and imaging systems offer the possibility of obtaining

a three-dimensional model of the interior of an otherwise opaque material. A special high-resolution diffractometer has been constructed for space- and temperature-dependent stress and strain analysis of materials and larger samples.

Finally, an improved facility for the medical therapy of near-surface tumors using fast and epithermal neutrons, reconverted from thermal neutrons with a fission converter, has been built, the result of successful prototype work at the FRM. This facility may also be used for technical applications of fast neutrons in the field of radiography and tomography.

Editor's Note: Readers may recognize that the use of highly enriched uranium (HEU), as is currently used in the FRM-II research reactor, has been the subject of some international controversy in the context of the proliferation of nuclear arms. In comments to this editor, the author notes that "the flux-to-power ratio of FRM-II, compared with existing research reactors, is due to the compact core using HEU, and the current core design occurred in the mid-1990s in parallel with discussions with concerned agencies, particularly in the United States. Intentions are to replace the HEU core by a core with lower enrichment when new higher density fuel materials have been developed and qualified." *A good summary of the ongoing concerns may be found in the March 30, 2001 issue of* Science *(**291**, pp. 2527-2529) and references therein. [ENK]*

Wolfgang Gläser is Professor head of the Institute E21 of the Technische Universität München and the scientific head of the FRM. He was also the spokesman of the board of directors for the FRM-II.

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FACILITIES

The SESAME Project: An International Synchrotron Radiation Research Center in the Middle East

Herman Winick and Ercan Alp

The SESAME (Synchrotron-Light for Experimental Science and Applications in the Middle East) Project aims to establish the Middle East's first major international center for materials science and other research activities as a cooperative venture by the scientists of the region. It is being developed under the umbrella of the United Nations Educational, Scientific, and Cultural Organization (UNESCO) and will be located in Allaan, Jordan (30 km from Amman and 30 km

"…SESAME will serve as a catalyst…"

from the King Hussein/Allenby Bridge crossing of the Jordan River). Eleven countries have joined the project so far: Armenia, Cyprus, Egypt, Greece, Iran, Israel, Jordan, Morocco, Oman, Palestinian Authority, and Turkey. Observer countries include Germany, Italy, Japan, Russia, Sweden, the United Kingdom, and the United States. Several other countries have expressed interest in joining.

SESAME will have as its centerpiece a synchrotron radiation source ("ring") based on a gift from Germany of the 0.8-GeV BESSY I storage ring and injector system that ended operation in November 1999. With the technical support of teams from Armenia and Russia and funds provided by SESAME member countries and UNESCO, the components of these machines have been dismantled and documented in a controlled way and are now stored in Berlin ready for shipment to Jordan and for their upgrading and reassembly.

The BESSY I ring will be significantly upgraded in size and energy. It will accommodate four insertion devices rather than the two that BESSY I originally accommodated. Superconducting multipole wigglers will extend the spectral range

of the x-rays produced to 20-25 keV. With these upgrades, the facility will become a very capable, broad spectral range source—it has been called a "super second-generation" or a "2.5-generation" source. Because of its low beam emittance (50 nm-rad), a measure of beam diameter and angular divergence, high stored beam current (up to 700 mA), and small apparent source size at the wiggler source points (0.45 x 0.05 mm sigmas, or standard deviation), very high flux and flux density will be available from the infrared region to hard x-rays. Undulators, another type of insertion device, will provide relatively high brightness at photon energies up to about 1 keV.

Thus, SESAME will provide excellent performance for most applications, including those now done at multi-GeV rings. Specific research programs planned for SESAME include structural molecular biology, molecular environmental science, surface and interface science, micro-electromechanical devices, x-ray imaging, archeological microanalysis, materials characterization, and medical applications. As an international scientific and technological center of excellence open to all qualified scientists from the Middle East and elsewhere, SESAME will serve as a catalyst for the scientific, technical, and economic development of the region and strengthen collaboration in science. The center will be jointly operated and supported by all member countries, with additional support from other countries interested in promoting the peaceful development of science and technology in the Middle East.

Major benefits of the project have already been realized at workshops and schools on accelerator science and technology, materials research, and structural molecular biology. Reports on these meetings are available on the World Wide Web at *www.sesame.org.jo*. These and other meetings have brought scientists and engineers from SESAME member countries together with experts in synchrotron radiation sources and applications. Twenty scientists and engineers are currently spending six to twelve months each working on accelerator projects at European laboratories, and eight scientists have completed or are now completing long-term visits to U.S. synchrotron radiation laboratories working on applications of synchrotron radiation. Support for these activities has been provided by UNESCO, SESAME member countries, the U.S. Department of Energy, the International Center for Theoretical Physics (Trieste), and the International Atomic Energy Agency, as well as synchrotron radiation laboratories in Europe and the United States.

After the selection of a building location, studies of the land at the site pertinent to construction were conducted, and building design is in progress. There are efforts to form multinational research groups that can work towards raising the necessary funds to build scientific instruments at the beamlines. With continued progress in these developments, it is expected that the research program can start in 2003 or 2004.

Herman Winick and Ercan Alp are cochairs of the SESAME Scientific Committee.

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Community

The National Materials Advisory Board

Based in Washington, D.C., the National Materials Advisory Board (NMAB) is an organization of the National Academies (U.S.). The National Academies survey the broad possibilities of science, engineering, and medicine, promoting cooperation in research both within the United States and internationally and bringing attention to the value of the scientific and technical communities in achieving national goals. The National Academies assess the state of current scientific understanding, which helps illuminate public policy decision making, and disseminate research works throughout the world.

Since 1951, the NMAB has affected U.S. policies for competitiveness, public health and safety, research directions, and other issues critical to materials science. The rich history of the NMAB goes back to its roots in the War Metallurgy Board in the U.S. Department of Defense.

The NMAB acts in four general ways:

1. Meets twice each year to examine issues of national importance to materials science and determine the board's direction.
2. Provides a public forum for issues of importance to materials science:
   - Disseminates results of NMAB studies and other activities,
   - Provides user-friendly web pages as a gateway to reliable information,
   - Writes opinion and policy articles based on NMAB activities,
   - Provides requested information to the U.S. government, and
   - Participates in materials science coordination activities.
3. Coordinates with overall activities of the National Academies in areas of education, innovation, and awareness, and ensures that materials issues are considered in studies and activities carried out by other boards in the National Academies.
4. Studies pressing issues of the day. The following constitute most of the NMAB's programmatic activities:
   - Topical workshops and similar meetings that may be called together with experts in synchrotron radiation sources and applications. Twenty scientists and engineers are currently spending six to twelve months each working on accelerator projects at European laboratories, and eight scientists have completed or are now completing long-term visits to U.S. synchrotron radiation laboratories working on applications of synchrotron radiation. Support for these activities has been provided by UNESCO, SESAME member countries, the U.S. Department of Energy, the International Center for Theoretical Physics (Trieste), and the International Atomic Energy Agency, as well as synchrotron radiation laboratories in Europe and the United States.
   - Topical roundtables to bring together policy makers, technical experts, and practitioners for discussion: The roundtable may set any schedule for meetings or workshops. No reports or recommendations are produced, and no activity reporting is required. Committee members are appointed by standard National Academies procedure, except for government members, who are appointed by virtue of their position title rather than their personal resume.
   - Assessments of technical programs to provide advisory guidance to federal initiatives and organizations: This activity may be done on a one-time or ongoing basis. Full activity reporting is required, as is a full consensus report review.
   - Standing committees to maintain awareness of issues of continuing importance: These committees issue letter reports or sponsor other NRC activities. Committee members are appointed, and full activity reporting is required.

   Other activities are also possible under National Academies guidelines that apply to the goals of advising the nation and facilitating high-level discussion.

   Current NMAB studies address topics ranging from advanced energetic materials to structural nanomaterials to advanced fibers. One of the NMAB's flagship efforts is a wide-ranging study on *Materials Research for "Defense-After-Next."* For more information, refer to the NMAB Web site at *www.nationalacademies.org/nmab*.

   The NMAB's activities rely on a cadre of experts in many areas who volunteer their time to participate in and advise our committees and review final reports. If you are interested in helping us in our mission as "advisors to the nation," please contact the author. Look for coverage of the activities of the NMAB in future issues of *IUMRS Facets*.

— *Toni Maréchaux, Director*
National Materials Advisory Board
E-mail: tmarecha@nas.edu

Community

Workshop on International Collaboration and Networking Focuses on Nanotechnology

The Workshop on International Collaboration and Networking was held at the IUMRS-ICAM conference in Cancun, Mexico, on August 28, 2001. Chaired by professors R. P. H. Chang (Northwestern University, USA) and Miguel Yacaman (University of Texas–Austin, USA), the event sought to lay the foundation for building a network of materials researchers around the world.

Nanotechnology was the theme of the workshop, and the participants extended their ideas to the broader, interdisciplinary field of materials. While researchers presented updates on the state of nanotechnology in their countries, representatives of funding agencies and policy institutions described the context in which research is undertaken. The presentations offered a balance between infrastructure and implementation, which led discussions about ways in which a worldwide network can serve a range of interests.

Professor Chang demonstrated a model, the "International Virtual Institute," that included on-line laboratories and virtual offices. At its height, the workshop hosted 80 people from 12 countries. The participants represented programs that ranged from those that already invest heavily in nanotechnology to those that are now identifying an investment strategy. They agreed that easy and free access to information would make a significant difference to the success of materials research and the likelihood of international collaborative projects. Breakout groups debated ways the infrastructure to support such a network should develop. For more information about the workshop, write to *mri@northwestern.edu*.

John Rumble of the National Institute of Standards and Technology speaks on "Databases for Nanotechnology."

— *Kimberly Bartlett*

Prospect

News of the IUMRS and its Adhering Bodies

International Conference on Materials for Advanced Technologies (ICMAT2001)

Good things come in small packages, at least such was the case recently for the relatively small and newly founded Materials Research Society of Singapore. It successfully organized the International Conference on Materials for Advanced Technologies (ICMAT2001), which was held at the Singapore International Convention and Exhibition Centre from July 1-6, 2001. The response to ICMAT2001 was overwhelming: About 1400 members of the international scientific and materials research community representing 42 countries attended the conference. The conference was chaired by B.V. R. Chowdari, president of MRS-Singapore, and co-chaired by the director of the Institute of Materials Research and Engineering, Prof. Albert F. Yee.

Among the plenary speakers at the conference were four Nobel laureates, who also gave special evening lectures to the public. The topics addressed in these public lectures were Semiconductor Heterostructures (Z. I. Alferov, Ioffee Institute, St. Petersburg, Russia), Perovskites (J.G. Bednorz, IBM Zurich Research Laboratories, Ruschlikon, Switzerland), Plastic Electronics (Alan J. Heeger, University of California, Santa Barbara, USA) and Physics in the Communication Industry (Horst L. Stormer, Columbia University and Lucent Bell Laboratories, USA).

The materials areas covered at ICMAT 2001 included ionic and mixed conducting materials for advanced batteries and fuel cells, biomaterials for tissue engineering, ceramics, magnetic materials for data storage, diamond-like carbon, polymers and composites, environmental materials, nanoscale materials and technologies, semiconducting materials for optoelectronics and high-frequency electronics applications, and ceramic superconductors for quantum devices and power transmission. Specialized aspects of crystallization and interfacial processes, thin films, modeling, microelectronic packaging, and materials education were also addressed. A detailed summary of ICMAT2001 may be found at *www.iumrs.org/docs/ ICMAT2001rpt.doc*.

— *B.V.R. Chowdari*

Prospect

News of the IUMRS and its Adhering Bodies

Expansion of European Materials Research Society Activities to Central and Eastern Europe

Ryszard Ciach

Advanced materials are being used not only in construction and machinery but also in electronics, automation, and biomaterials. These new materials require special technologies and a wide variety of research methods. To address this growth, the European Materials Research Society (E-MRS) was

> *"The growing number of participants from Central European countries has been a noticeable feature of recent meetings…"*

founded 17 years ago. At first, its activities were concentrated in countries of the European Union; they have now extended throughout Europe and beyond. The E-MRS is a member of the International Union of Materials Research Societies (IUMRS), which includes similar organizations from countries around the world. These societies organize symposia, conferences, and training; publish journals and books; and support research and technology transfer to industry.

Current E-MRS membership numbers approximately 5000. Among the many conferences E-MRS sponsors, perhaps the most important is the Spring Meeting held every June in Strasbourg, France. These meetings are a unique opportunity for forming new cooperative networks and fostering research in materials science. In 2000, the Spring Meeting was held in conjunction with the IUMRS International Conference on Electronic Materials. Approximately 1500 participants attended 18 specialized symposia. The growing number of participants from Central European countries has been a noticeable feature of recent meetings, but much untapped research potential remains.

Symposium in Krakow

On November 16–17, 2000, the Executive Committee of the E-MRS organized a symposium in Krakow, Poland, entitled "European Materials Research Society in Central and Eastern Europe," to bring together scientists from all of Europe. The symposium was a response to the remarkable increase in materials science activity and the broadening scope of materials applications, which are leading to the development of more complicated morphologies and structures, such as composites and nanomaterials.

E-MRS founder Paul Siffert

Participants included Giovanni Marletta, 2000 E-MRS President; Paul Siffert, E-MRS General Secretary; Peter Glasow, 2000 IUMRS Vice President; and Kazimierz J. Flaga, Chancellor, and Marcin Chrzanowski and Ryszard Henryk Kozlowski, Deputy Chancellors, of the Krakow University of Technology.

In an initial session, the achievements of two leading institutes were presented. Zbigniew N. Rak discussed electronic and nanotechnology materials at the Netherlands Energy Research Foundation ECN in Petten. Petro Smertenko, representing the Eureka project in Ukraine, reported on similar investigations at the Semiconductor Institute in Kiev and on the Eureka projects based on 20 years of Polish-Ukrainian cooperation.

Siffert Honored

The Foundation of Material Science Development honored Siffert with the Prof. J. Czochralski Gold Medal. Glasow described Siffert's career, emphasizing his unique scientific achievements in electronic materials. Siffert graduated 50 PhDs, was an author or co-author of more than 500 scientific publications, and was one of the founders of E-MRS. Anna Pajaczkowska, President-Elect of the Polish Crystal Growth Society, presented a silhouette of Czochralski to Siffert. She remarked that Czochralski is the most commonly found Polish name in the materials science literature, and she has used the Czochralski method in crystal synthesis at the Institute of Electronic Materials Technologies for many years. The Polish Crystal Growth Society has long collaborated with the German Crystal Growth Society because Czochralski performed a substantial part of his research during the years 1907–1928 in Germany, where he founded the Deutsche Gesellschaft für Metallkunde (now Deutsche Gesellschaft für Materialkunde).

In a formal ceremony near a statue of Czochralski, exhibited for the occasion by the Polish Ministry of Culture and National Heritage, Ryszard Ciach, President of the Foundation for Materials Science Development, presented the medal to Siffert. A nephew of Czochralski also participated in the ceremony. Approximately 70 representatives from Poland, Germany, France, Belgium, The Netherlands, Ireland, Sweden, Great Britain, Ukraine, Lithuania, Latvia, Hungary, Belarus, and Bulgaria enjoyed a reception following the ceremony.

Society Business

The E-MRS Executive Committee met with participants from Central European countries to discuss E-MRS activities in that part of Europe. Central European scientists wish to work with other European scientific institutes and participate in European Union projects. For example, institutions in Poland are joining forces with organizations from other parts of Europe:

- Warsaw University of Technology is developing its Institute of Materials Science.
- Krakow University of Technology participates in scientific projects supported by the European Union and establishes international schools. The university has demonstrated its commitment by creating an E-MRS area committee for Central Europe with the help of the Foundation for Materials Science Development.
- The Foundation for Materials Science Development has a strong tradition of cooperating with E-MRS and has cosponsored several joint conferences, including the NATO

Prospect

News of the IUMRS and its Adhering Bodies

Advanced Study Institute on Advanced Light Alloys and Composites and the E-MRS European Conference on Photovoltaics joined with the Contractors Meeting of European Commission Photovoltaics Projects JOULE II in Krakow.

The Executive Committee agreed on the following:

- The E-MRS Committee for Central Europe will be established with offices at the Krakow University of Technology. The committee consists of 12 scientists from Poland, Ukraine, Lithuania, Latvia, Hungary, Belarus, and Bulgaria. Ryszard Ciach was elected chairman.
- The committee will initiate international cooperation and integration in the field of materials engineering. Special care will be taken to help scientists from Central Europe participate in European Union projects.
- One of the committee's tasks will be to organize E-MRS Fall Meetings in Central European countries. These events will be similar in nature to the E-MRS Spring Meeting.

The first E-MRS Fall Meeting will be held in Krakow in August 2002. Topics will include:

- Memory shape effects (materials, technologies, applications)
- Photovoltaics (advanced technologies, new ideas, modern photovoltaics technologies)
- Light alloys and composites (structure, properties, applications)
- Copper and its alloys
- Nanomaterials
- Software development for process and materials design.

— *Prof. Ryszard Ciach*
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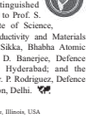
Fax: + 48 12 628 25 20
E-mail: rciach@pk.edu.pl

2001 Sōmiya Award

Each year, the International Union of Materials Research Societies (IUMRS) presents the Sōmiya Award for International Collaboration in Materials Research for the most significant research (on real materials) conducted by a team whose members are drawn from at least two continents. The award honors Prof. Shigeyuki Sōmiya, Emeritus Professor of Tokyo Institute of Technology, Dean at Teikyo University of Science and Engineering, and winner of the MRS Medal and the Japanese Scientific Academic Award.

The IUMRS Commission on Awards selects a winning team on the basis of nominations received from member societies and the broader materials research community. In addition to the award, the winners are given an opportunity to make a presentation at the annual IUMRS conference and complimentary registration at the IUMRS International Conference on Advanced Materials (ICAM), hosted this year by the Materials Research Society-Mexico in Cancun, Mexico, August 26–30, 2001.

Selecting the winner among this year's outstanding nominations was a challenging task. The Commission chose a U.S.-European joint research team led by Dr. Antonio Tomsia of Lawrence Berkeley National Laboratory. They are cited for their research into improving the durability of the bone-metal interface in medical implants through the introduction and testing of new advanced materials interlayers—a contribution of great potential effect on human health worldwide. An abstract of their investigation, entitled "Graded Bioactive Coatings for Medical Implants," is available through the IUMRS web site at *www.iumrs.org/somiya.html*.



Dr. Antonio P. Tomsia

Prof. Jose S. Moya

The collaborators on this award-winning research are as follows:

- Dr. Antoni P. Tomsia, Lawrence Berkeley National Laboratory, United States
- Prof. Jose S. Moya, Instituto de Ciencia de Materiales de Madrid-CSIC, Spain
- Prof. S. de Aza, Instituto de Ceramica y Vidrio (CSIC), Spain
- Prof. E. Guitian, Instituto de Ceramica y Vidrio (CSIC), Spain
- Prof. Grayson W. Marshall, University of California at San Francisco, United States
- Prof. Sally J. Marshall, University of California at San Francisco, United States
- Dr. Eduardo Saiz, Lawrence Berkeley National Laboratory, United States
- Dr. Jose Gomez-Vega, Lawrence National Berkeley Laboratory, United States (now at Nagoya University, Japan).

MRS India Presents Annual Awards

At its most recent Annual General Meeting, held at Science City, Kolkata, India, the following awards were presented: the Distinguished Materials Scientist of the Year Award to Prof. S. Ranganathan of the Indian Institute of Science, Bangalore; the MRSI-ICSC Superconductivity and Materials Science Annual Prize to Dr. S. K. Sikka, Bhabha Atomic Research Centre, Mumbai, and Dr. D. Banerjee, Defence Metallurgical Research Laboratory, Hyderabad; and the Distinguished Lectureship Award to Dr. P. Rodriguez, Defence Research and Development Organisation, Delhi.

Cycloid Fathom Technical Publishing, Downers Grove, Illinois, USA

Chapter 3 Presidents and EC members

3.1 Introduction of Past Presidents and EC members

3.1.1Presidents of IUMRS

List of IUMRS Presidents from 1991-2022

1. 1991-1992 R.P.H. (Bob) Chang from MRS(USA)
2. 1993-1994 Paul Siffert from E-MRS(France)
3. 1995-1996 Masao Doyama from MRS-J (Japan)
4. 1997-1998 Rodney Ewing from MRS (USA)
5. 1999-2000 Heng De Li from C-MRS(China)
6. 2001-2002 Peter Glasow from E-MRS (Germany)
7. 2003-2004 Robert Nemanich from MRS(USA)
8. 2005-2006 Zhou Lian from C-MRS(China)
9. 2007-2008 Gabriel Crean from E-MRS(Ireland)
10. 2009-2010 Howard Katz from MRS(USA)
11. 2011-2012 B.V.R. Chowdari from MRS-Singapore(Singapore)
12. 2013-2014 Osamu Takai from MRS-J (Japan)
13. 2015-2016 Hanns-Ulrich Habermeier from E-MRS(Germany)
14. 2017-2018 Soo Wohn Lee from MRS-Korea (South Korea)
15. 2019-2020 Yafang Han from C-MRS(China)
16. 2021-2022 Rodrigo Martins from E-MRS(Portugal)

Prof. R.P.H. (Bob) Chang
President: 1991-1992
General Secretary: 1993-2017
Recommenced by MRS

Prof. Paul Siffert
President: 1993-1994
First vice president: 1991-1992
Recommenced by E-MRS

Prof. Masao Doyama
President: 1995-1996
First vice president: 1993-1994
Recommenced by MRS-Japan

Prof. Rodney Ewing
President: 1997-1998
First vice president: 1995-1996
Secretary: 1991-1994
Recommenced by MRS

Prof. Heng De Li
President: 1999-2000
First vice president: 1997-1998
Recommenced by C-MRS

Prof. Peter Grasow
President: 2001-2002
First vice president: 1999-2000
Recommenced by E-MRS

Prof. Robert Nemanich
President: 2003-2004
First vice president: 2001-2002
Recommenced by MRS

Prof. Zhou Lian
President: 2005-2006
First vice president: 2003-2004
Recommenced by C-MRS

Prof. Gabriel Crean
President: 2007-2008
First vice president: 2005-2006
Treasurer: 1998-1999
Recommenced by E-MRS

Prof. Howard Katz
President: 2009-2010
First vice president: 2007-2008
Recommenced by MRS

Prof. B.V.R. Chowdari
President: 2011-2012
First vice president: 2009-2010
Recommenced by MRS-Singapore

Prof. Osamu Takai
President: 2013-2014
First vice president: 2011-2012
Second vice president: 2008-2009
Recommenced by MRS-Japana

Prof. Hanns-Ulrich Habermeier
President: 2015-2016
First vice president: 2013-2014
Second vice president: 2012-2013
Recommenced by E-MRS

Prof. Soo Wohn Lee
President: 2017-2018
First vice president: 2015-2016
Treasurer: 2012-2013
Recommended by MRS-Korea

Prof. Yafang Han
Present: 2019-2020
First vice president: 2017-2018
Second Vice President: 2014-2015
Treasurer: 2008-2011
Recommended by C-MRS

Prof. Rodrigo Martins
Present: 2021-2022
First vice president: 2019-2020
Second Vice President: 2018
Recommended by E-MRS

3.1.2 IUMRS Officers List

Year	Presidents	First Vice President	Second Vice President	Secretary	Treasurer
1991	R.P.H.(Bob) Chang	Paul Siffert		Rodney Ewing	Shigeyuki Sômiya
1992	R.P.H.(Bob) Chang	Paul Siffert		Rodney Ewing	Shigeyuki Sômiya
1993	Paul Siffert	Masao Doyama		Rodney Ewing	Shigeyuki Sômiya
1994	Paul Siffert	Masao Doyama		Rodney Ewing	Li-Chung Lee
1995	Masao Doyama	Rodney Ewing		Gou-Chung Chi	Li-Chung Lee
1996	Masao Doyama	Rodney Ewing		Gou-Chung Chi	Ryoichi. Yamamoto
1997	Rodney Ewing	Hengde Li		Chenggong Li	Ryoichi. Yamamoto
1998	Rodney Ewing	Hengde Li		Chenggong Li	Gabriel Crean
1999	Hengde Li	Peter Glasow		Lih. Z. Li	Gabriel Crean
2000	Hengde Li	Peter Glasow	Lih J. Chen	Lih. Z. Li	HannsHabermeier
2001	Peter Glasow	Robert Nemanich	Lih J. Chen	Elton N. Kaufmann	HannsHabermeier
2002	Peter Glasow	Robert Nemanich	Palle Rama Rao	Elton N. Kaufmann	Jong-Wan Park
2003	Robert Nemanich	Lian Zhou	Palle Rama Rao	M J Yacaman (health issue)	Jong-Wan Park
2004	Robert Nemanich	Lian Zhou	John Baglin	Jesus Gonzalez (completed term)	HyeongJoon Kim
2005	Lian Zhou	Gabriel Crean	John Baglin	Guoqing Zhang	HyeongJoon Kim
2006	Lian Zhou	Gabriel Crean	B. V. R. Chowdari	Guoqing Zhang	Hiroshi Yamamoto
2007	Gabriel Crean	Howard Katz	B. V. R. Chowdari	John Baglin	Hiroshi Yamamoto
2008	Gabriel Crean	Howard Katz	Osamu Takai	John Baglin	Yafang Han
2009	Howard Katz	B. V. R. Chowdari	Osamu Takai	Charles Qiang Feng	Yafang Han
2010	Howard Katz	B. V. R. Chowdari	AbdelilahSlaoui	Charles Qiang Feng	Yafang Han
2011	B. V. R. Chowdari	Osamu Takai	AbdelilahSlaoui	Charles Qiang Feng	Yafang Han
2012	B. V. R. Chowdari	Osamu Takai	HannsHabermeier	Charles Qiang Feng	SooWohn Lee
2013	Osamu Takai	HannsHabermeier	HannsHabermeier	Yuan Ping Feng	SooWohn Lee
2014	Osamu Takai	HannsHabermeier	Yafang Han	Yuan Ping Feng	Sergio Mejía Rosales
2015	Hans Habermeier	SooWohn Lee	Yafang Han	Yuan Ping Feng	Sergio Mejía Rosales
2016	Hans Habermeier	SooWohn Lee	Roberto MendonçaFaria	Yuan Ping Feng	Paul Horng
2017	SooWohn Lee	Yafang Han	Roberto MendonçaFaria	Yuan Ping Feng	Paul Horng
2018	SooWohn Lee	Yafang Han	Rodrigo Martins	Yuan Ping Feng	Paul Horng
2019	Yafang Han	Rodrigo Martins	Yuan Ping Feng	Jim Williams	Paul Horng
2020	Yafang Han	Rodrigo Martins	Yuan Ping Feng	Jim Williams	Naoki Kishimoto
2021	Rodrigo Martins	Osvaldo N. Oliveira	Yuan Ping Feng	Jim Williams	Naoki Kishimoto
2022	Rodrigo Martins	Osvaldo N. Oliveira		Jim Williams	

3.1.3 IUMRS EC's List

Name	Society from	Name	Society from
Jim Williams	Australia-MRS	RyoichiYamamoto	MRS-Japan
Osvaldo N. Oliveira	MRS-Brazil	Naoki Kishimoto	MRS-Japan
Roberto MendonçaFaria	MRS-Brazil	SooWohn Lee	MRS-Korea
Hengde Li	C-MRS	Jong-Wan Park	MRS-Korea
Chenggong Li	C-MRS	HyeongJoon Kim	MRS-Korea
Lian Zhou	C-MRS	Jesus Gonzalez	MRS-Mexico
Guoqing Zhang	C-MRS	Sergio Mejía Rosales	MRS-Mexico
Yafang Han	C-MRS	M J Yacaman	MRS-Mexico
Qiang (Charles) Feng	C-MRS	B. V. R. Chowdari	MRS-Singapor
Paul Siffert	E-MRS	Yuan Ping Feng	MRS-Singapore
Hanns-Ulrich Habermeier	E-MRS	Gou-Chung Chi	MRS-Taiwan
AbdelilahSlaoui	E-MRS	Li-Chung Lee	MRS-Taiwan
Peter Glasow	E-MRS	Lih J. Chen	MRS-Taiwan
Gabriel Crean	E-MRS	Paul Horng	MRS-Taiwan
Rodrigo Martins	E-MRS	R.P.H.(Bob) Chang	MRS (USA)
Palle Rama Rao	MRS-India	Elton N. Kaufmann	MRS (USA)
Masao Doyama	MRS-Japan	Rodney Ewing	MRS (USA)
Shigeyuki Sômiya	MRS-Japan	John Baglin	MRS (USA)
Osamu Takai	MRS Japan	Howard Katz	MRS (USA)
Hiroshi Yamamoto	MRS-Japan	Robert Nemanich	MRS (USA)

3.2 GA Meeting Photos Collection

2013 IUMRS GA meeting
at Qingdao, China

2018 IUMRS GA meeting
at Daejeon, Korea

2019 IUMRS GA meeting at Nice, French

3.3 Words from Past Presidents and EC members

The Development of Collaborative Friendships All Over the World

By E-MRS President Prof. P. Siffert

Professor P. SIFFERT

The mid 1960s were truly an euphoric period for Science and Technology with many breakthroughs and developments in fields which have transformed the lives of millions and have changed the world we live in: semiconductors, transistors, ICT, etc. The traditional "Solid State" Physics or Chemistry was no longer able to describe these revolutionary developments and to encompass the multidisciplinarity of this new world. The concepts of Materials Science and "ADVANCED MATERIALS" were born.

In many ways it was the development of electron microscopy that introduced the understanding of the behaviour of materials. Previously the subject was regarded in discrete units – metals, plastics and ceramics. Very soon many University Metallurgy Departments broadened their scope to include the other areas and changed their title to Materials Departments.

It was a logical development rather than a surprise that Materials Conferences focusing on a ever widening range of topics started to appeared. In 1973 MRS was established in the USA to promote the dissemination of information and scientific collaboration by hosting interdisciplinary materials conferences. A decade later in 1983, MRS-Europe, now the European Materials Research Society (E-MRS) was started and formally legalized at the Strasbourg Court in 1985.

As early as 1984 in a bilateral MRS and MRS -Europe meeting held during the MRS conference in Boston an "International Committee" was proposed (Figs 1 & 2). The objective was to establish an international Community comprised of the various societies concerned with subject of 'Materials', rather than a governing body. The aim was to foster interactions between autonomous independent peer Societies devoted to Materials all over the world.

However, in the early 1980s the world was vastly different from today, both scientifically, and economically, but also politically. In many parts of the world any form of scientific exchange and interaction was possible only through intergovernmental, diplomatically arranged contracts. Even during those dark days, these arrangements enabled limited contacts to be established between selected institutions. I was extremely fortunate to participate in one of these diplomatically arranged exchanges, and today I still cherish the many unusual memories and experiences. One example to illustrate the difficulties that some labored under: An internationally well recognized materials female scientist came to visit my laboratory in Strasbourg for two weeks.

During the first weekend I drove her around the area to show her the countryside. Unfortunately, she laddered her nylons and became very nervous. Why? She confessed that when returning home, she would have to hand them back in good shape.

Driving back to Strasbourg on entering the city we encountered a traffic jam. She commented: that it never occurred in her home country because all citizens use buses or bikes. A different civilization existed then and today it is one which many Western countries are trying to replicate half a century later! However, on the Monday morning I provided her with some money and the time to spend a few hours in a supermarket, which made her a definite friend!

Despite all these problems and barriers to collaboration a small team of internationally recognised materials scientists took the initiative to try to launch a world community of material scientists. The leaders of these initiatives include among others: Woody White, Bob Chang, Elton Kaufmann, Masao Doyama, ShigeyakaSômiya, Hengde Li and myself. With the encouragement and advice of the leaders of MRS, similar societies developed successively in Japan, China, Mexico, Taiwan, India and Australia.

The International Union of Materials Research Societies was formally established in 1990-91 and incorporated in Pennsylvania, where accounting and banking services were generously provided by MRS. The new Union was specifically intended to be modelled on two existing international scientific Unions, the International Union of Pure

and Applied Physics (IUPAPP) and the International Union of Pure and applied Chemistry (IUPAC). The founding members of IUMRS were the materials research societies in America, Europe, Brazil, China, Australia, India, Korea, Mexico and Taiwan.

Over the intervening years these founding members have been joined by several others to provide the global world coverage that existstoday.One of the main activities of this new Union giving it global visibility was to establish international conferences, the well-known global conferences ICEM, ICAM as well as conferences limited to Asia and Young Researchers today.

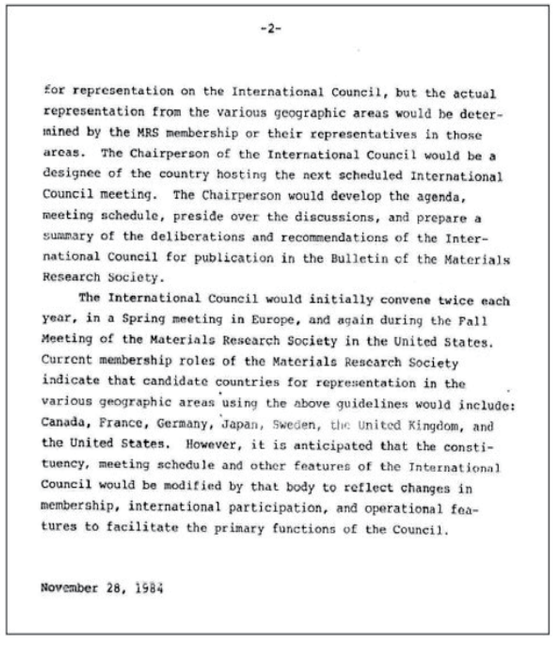
However, a major achievement, but a totally globally invisible consequence has been the friendly coming together during bilateral events, organised between the individual societies which have been the seed for closer collaborations and friendly personal relationships. This has been the case especially for E-MRS as demonstrated by the set of pictures collected over years during these friendly visits, exchanges and bilateral events.

To establish this worldwide collaborative scientific and friendly network huge efforts have been needed to bring together so many different cultures and attitudes. In this regard Here R.P.H. (Bob) Chang has spent much of his life in reaching this goal.

However, we are close to a generational change and the new generation of materials scientists has to build on these friendly relationships as well as develop the attractiveness of IUMRS. It is to be hoped that it can be developed much further, so that the materials community provides the leadership to meet the global challenges, especially those associated with the environment and the very intense and sometimes aggressive international competition.

P. SIFFERT

Founder of E-MRS & Past President IUMRS

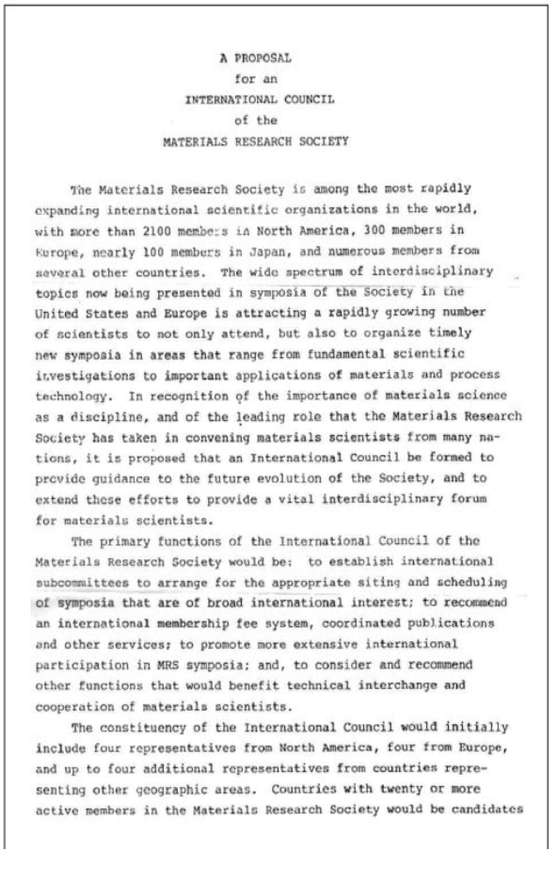


-2-

for representation on the International Council, but the actual representation from the various geographic areas would be determined by the MRS membership or their representatives in those areas. The Chairperson of the International Council would be a designee of the country hosting the next scheduled International Council meeting. The Chairperson would develop the agenda, meeting schedule, preside over the discussions, and prepare a summary of the deliberations and recommendations of the International Council for publication in the Bulletin of the Materials Research Society.

The International Council would initially convene twice each year, in a Spring meeting in Europe, and again during the Fall Meeting of the Materials Research Society in the United States. Current membership roles of the Materials Research Society indicate that candidate countries for representation in the various geographic areas using the above guidelines would include: Canada, France, Germany, Japan, Sweden, the United Kingdom, and the United States. However, it is anticipated that the constituency, meeting schedule and other features of the International Council would be modified by that body to reflect changes in membership, international participation, and operational features to facilitate the primary functions of the Council.

November 28, 1984



A PROPOSAL
for an
INTERNATIONAL COUNCIL
of the
MATERIALS RESEARCH SOCIETY

The Materials Research Society is among the most rapidly expanding international scientific organizations in the world, with more than 2100 members in North America, 300 members in Europe, nearly 100 members in Japan, and numerous members from several other countries. The wide spectrum of interdisciplinary topics now being presented in symposia of the Society in the United States and Europe is attracting a rapidly growing number of scientists to not only attend, but also to organize timely new symposia in areas that range from fundamental scientific investigations to important applications of materials and process technology. In recognition of the importance of materials science as a discipline, and of the leading role that the Materials Research Society has taken in convening materials scientists from many nations, it is proposed that an International Council be formed to provide guidance to the future evolution of the Society, and to extend these efforts to provide a vital interdisciplinary forum for materials scientists.

The primary functions of the International Council of the Materials Research Society would be: to establish international subcommittees to arrange for the appropriate siting and scheduling of symposia that are of broad international interest; to recommend an international membership fee system, coordinated publications and other services; to promote more extensive international participation in MRS symposia; and, to consider and recommend other functions that would benefit technical interchange and cooperation of materials scientists.

The constituency of the International Council would initially include four representatives from North America, four from Europe, and up to four additional representatives from countries representing other geographic areas. Countries with twenty or more active members in the Materials Research Society would be candidates

Original Documents and photos of IUMRS history

MRS MATERIALS RESEARCH SOCIETY

E. N. Kaufmann *vice president*
Lawrence Livermore National Laboratory
P. O. Box 808, L-217
Livermore, California 94550
(415) 423-2640

December 12, 1984

P. Siffert
CNRS (Cronenberg)
Laboratory PHASE
F-67037 Strasbourg cedex
FRANCE

Dear Paul,

It was very good seeing you and Van Tran in Boston. I believe we accomplished a great deal in our committee meeting regarding the future relationship of MRS-Europe and MRS-US. I will be sending you a summary of the items I believe we settled. They include decisions on distribution of the bulletin and the membership directory, on making available copies for sale of meeting abstracts, and on the advertisement of the possibility to purchase conference proceedings. This note is simply intended to bring you up to date on the action taken by the MRS Council on Saturday, December 1. It regards the proposal that an International Council be formed according to the summary, prepared by Dick Schwoebel, of our evening committee meeting. The decision of the Council was to recommend the formation of what it preferred to call an "International Committee" as opposed to "International Council". The desire here was to avoid the formation, at least at this early stage, of a body which appears to have governing authority over all geographic branches. The purpose and function of the so-called International Committee would be essentially as we have discussed except for it's differing name.

I plan to appoint members to that committee for MRS-US and I would ask that you do the same in Europe. I believe the suggestion was that each of us select four individuals to serve on this committee and that the chairman be chosen by the branch where the next committee meeting will be held. I suggest that the first meeting of this committee be held in Strasbourg in May during your spring meeting and therefore I ask that you select a chairman for this group. The MRS-US Council was attempting to avoid a ridged structure characterized by the organizational chart which we have used as a working document. They in fact asked that we not use the chart at present because of the perception it seems to convey. I believe that the first issue to be dealt with by the new committee would be to determine what greater formality is necessary with regard to its own operations.

-2-

I enclose for your reference a copy of the summary provided by Dick Schwoebel of our original discussion on this subject. If you have any comments or concerns regarding the formation of the new committee please contact me. As a practical matter of course, our discussions will continue very much as they have, but perhaps with this smaller group, greater focus can be achieved on the issues that need to be resolved in the future. I look forward to seeing you in May and wish you, Van Tran and MRS-Europe every success with your upcoming efforts.

Very best regards and happy holidays,

E. N. Kaufmann

0514J/jh
copy to: J. B. Ballance
C. W. Draper
R. C. Ewing
V. T. Nguyen
G. E. Pike
R. L. Schwoebel
K. C. Taylor
C. W. White

Welcome party of the Russian and Ukrainian delegation at the first Academies of Sciences exhibition in the Western World, organized in 1992 by E-MRS. Notice that a young President Putin was a member of the Russian delegation (third from the right)

IUMRS-ICEM 2000 Conference in Strasbourg – General Assembly

International exchange visit (out of IUMRS)

China

December 15-16, 1994 Joint China MRS and E-MRS Symposium on "Electronic and Optoelectronic Materials", Beijing

2001 Bilateral Symposium on Energy related problems for the Future - Beijing, China

December 6-8, 2004 Nice, Sino-European Bilateral Meet on Materials and Energy

October 10th 2005 E-MRS - C-MRS Sino-European Bilater Workshop on Photovoltaics, Shangha

2nd World Materials Summit, Suzhou, **October 12-15, 2009**

India

February 13th, 1994

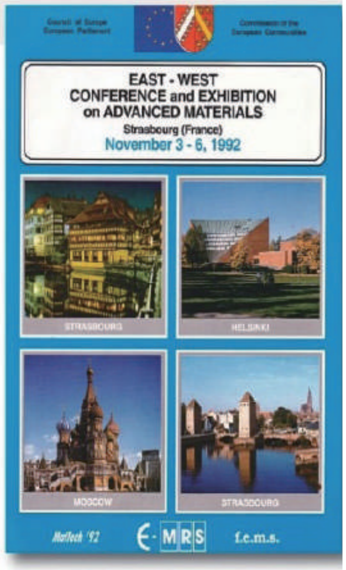
Russia

East West conference and exhibition on advanced materials **November 3-6, 1992**

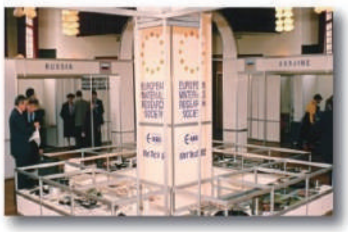
International exchange visit (out of IUMRS)

TECHNOLOGIE

Strasbourg, plate-forme scientifique Est-Ouest



1992 Mat TEC 92 Russia Ukraine Fall, Strasbourg



1993 E-MRS MATTECH Fall Conference, St Petersburg

Joint E-MRS – MRS Russia Conference on Radioactive Waste, Storage, Transportation, Recycling, Environment and Human impact, St Petersburg **1996**

E-MRS Fall Conference, Moscow **2002**

V. Putin, Strasbourg **July 2006**

Ukraine

Science for materails conference, Kiev **2002**

Japan

First International Conference on Electronic Materials **June 13-15, 1988**

New materials and new physical phenomena for electronics of the 21st century (ICEM'88), Shigaku-Kaikan, Tokyo, Japan

Kenya

MRS-Africa Implementation meeting, Nairobi **August 13th, 2003**

International exchange visit (out of IUMRS)

South Africa


Cape Town

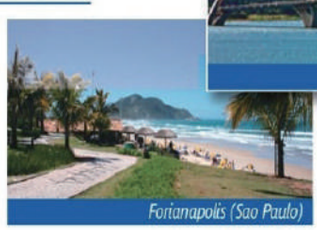

Pretoria


Johannesburg

Brazil

2006

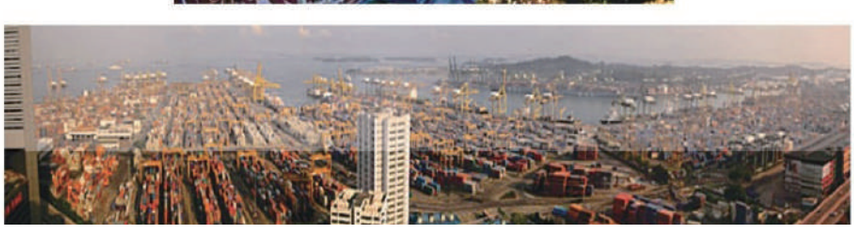

Brasilia


Forianapolis (Sao Paulo)


Cathedrale Brasilia

Singapore

July 1-6, 2007 International conference on materials for advanced technologies (icmat)



India

Bengalore **October 8-13, 2007**

Australia

IUMRS-icem, Sydney **July 28 - August 1, 2008**

Korea

IUMRS-ICEM Kintex, GyeongGi-Do **August 22-27, 2010**

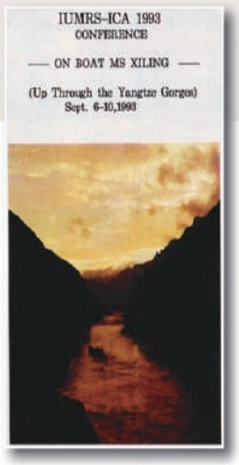
USA

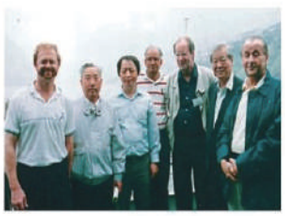
Boston

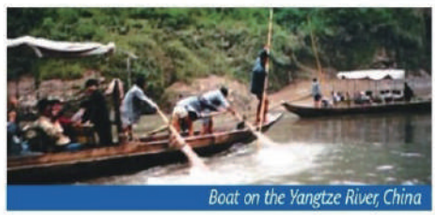
International exchange visit (within IUMRS)

List of Meetings with Chinese Representatives

1993 1st IUMRS-ICA International Conference in Asia







Boat on the Yangtze River, China

December 15-16, 1994 Joint China MRS and E-MRS Symposium on "Electronic and Optoelectronic Materials", Beijing

2000 IUMRS ICEM

2001 Bilateral Symposium on Energy related problems for the Future, Beijing

IUMRS-8th International Conference on Electronic Materials (ICEM)
Xian, China

June 10-14, 2002




E-MRS - IUMRS - C-MRS
Sino-European Bilateral Meeting on Material Aspects for Future Energy Supply, Nice

December 6-8, 2004

E-MRS - C-MRS Sino-European Bilateral Workshop on Photovoltaics
Shanghai, China

October 10th, 2005

Shanghai International Forum on the Development Trend of Advanced Materials

2005

Some Memories of IUMRS

By Prof. Lian Zhou, Former President of IUMRS (2005-2006)

Professor Lian Zhou

To celebrate the 30th anniversary of the International Union of Materials Research Societies (IUMRS), I write about some of my experiences with IUMRS.

For 8 years from 1999 to 2007, I had served as President of the Chinese Materials Research Society (C-MRS). During my term, IUMRS-ICEM2002 was successfully held in Xi'an, and in that meeting I was elected as IUMRS First Vice President (2003-2004) and President (2005-2006).

Promoting the cooperation and exchange between MRSs

C-MRS is one of the IUMRS initiators and an important member of the union, and has maintained a good friendship with friends of the international materials community, such as E-MRS, MRS-Japan and MRS etc. During my term as C-MRS president, C-MRS has jointly organized several Sino-European Meetings on Energy Materials. Besides maintaining good relations of cooperation with E-MRS and MRS, at the same time C-MRS has also paid great attention to cooperation with Asian MRSSocieties, in particular, developing a cooperative relationship with MRS-Taiwan. Since the foundation of IUMRS,MRS-Taiwan's president Prof. Lijun Chen and his successor, Prof. Zhongming Liu, are very friendly to C-MRS.

With the joint efforts, we have organized a number of seminars, involving Beijing, Hongkong and Taiwan. In addition, Professor Paul Chu of Hong Kong University of Science and Technology has also supported the work of C-MRS, frequently giving invited talks in important domestic meetings. Moreover, during my visits to Japan, in Tokyo I met several times the Japanese materials leading authority Prof. Masao Doyama and two MRS-Japan presidents to discuss bilateral cooperation.

In November 2005, I invited John Ballance, Peter Green of MRS and Peter Glasow and Gabriel Crean of E-MRS to China. First, in the International Forum on New Materials held in Ningbo, Changxu Shi, Peter Green, Paul Siffert, Peter Glasow and GabrielCrean made excellent presentations. Then, presentations were made at Shanghai Jiaotong University and received great response. These contributed to the C-MRS, E-MRS and MRS leaders meeting which was held in the West Lake of Hangzhou.

Later in Shanghai, discussions on IUMRS major issues and multilateral cooperation were continued. As a result, relationships among C-MRS, E-MRS and MRS were further strengthened. Soon after, with invitation from MRS, C-MRS sent a staff to MRS to receive training, and discussed the plan of organizing the 2008 MRS International Materials Research Conference in Shanghai, which was finally changed to be held in Chongqing. In my president's report as IUMRS President, I indicated resolutions on how to solve the problems that IUMRS faced, which was finally passed in the Nice meeting in 2006. During Prof. Hengde Li's term and my term as IUMRS President, both of us have tried our best to make contributions to IUMRS, representing C-MRS.

Initiating IUMRS World Materials Summit

After I was elected as First Vice President of IUMRS in the IUMRS-ICEM 2002 meeting in Xian, I hoped that China's materials circle might make a difference in the international community. During my attendance at a meeting in Europe, I made a special trip to meet with Professor Siffert and Professor Crean of E-MRS, discussing how to strengthen the contact between C-MRS and E-MRS, and how to play a role in IUMRS and make it strong. In April 2005, we invited Professor Siffert and Professor Glasow to Xi'an, to discuss plans of further cooperation and reform.

On this basis, we initiated the "Materials Research Societies Asian Leadership Meeting" in late April in Beijing. Professor Kim of MRS-Korea, Professor Hiroshi Yamamoto and Professor Masao Doyama of MRS-Japan, Prof. B.V.R.Chowdari of MRS-Singapore, Professor Zhongming Liu of MRS-Taiwan, Prof. Hengde Li and Prof. Yafang Han were present. MRS-India sent no representatives, owing to the time limitation.These meetings were focused on suggestions from each society on organizing the World Materials Congress and the World Materials Summit, found-

ing an international materials award, furthering IUMRS publication “Facets” and website construction, improving IUMRS operation efficiency, and promoting the exchanges among IUMRS member societies. Thus, at the 2005 IUMRS Assembly meeting held in Singapore in July, 2005, our proposal of organizing the world materials summit was passed. Later, the first World Materials Summit was successfully held in Lisbon, Portugal in October 2007, the second one was held in Suzhou, China in October 2009 and the third one will be held in Washington in October 2011. And later on, theworld materials summit was hold every two years by E-MRS and C-MRS, till 2019 in Hangzhou, China.

Joining ICSU

On October 20-22, 2005, as President of IUMRS I went to Suzhou to attend the 28th ICSU Congress, and made a presentation at the meeting. Succeeded in the voting, IUMRS officially joined the ICSU. Prior to this, John Baglin, Elton Kaufmann,myselfand others had done a lot of work, kept close correspondence with other leaders of IUMRS, requested support from the China Association for Science, Chinese Chemical Society, Chinese Academy of Sciences and the newly elected president of ICSU Prof. Goverdhan Metha, edited and printed in time 300 copies of IUMRS brochures and circulated to representatives of ICSU at Suzhou meeting to advertise IUMRS. All these efforts have helped to make final success.

Dedicated to materials research in my life, I am irrevocably committed to C-MRS and IUMRS. During my presidency term, I have participated in many important events of C-MRS and IUMRS, met with a number of materials scientists and friends at home and abroad. They have given me help and guidance, making my life full of joy and delight. Specially, I would like to mention here that in the materials circle in China, a group of senior materials scientists who have led the development of Chinese materials R & D, such as Prof. Changxu Shi and Prof. Hengde Li, at the age of 90s, still stick to their work on materials science. In early 2011, Prof. Changxu Shi won the country’s highest science & technology award. This is good luck and makes us proud of the Chinese materials circle!

Prof.Lian Zhou at 28th ICSU General Assembly, Suzhou, China, Oct. 2005

Prof. Lian Zhou, President of IUMRS, was talking with Prof. Goverdhan Mehta, President of ICSU, on Oct. 20 evening, 2005, before the Banquet of the 28th ICSU General Assembly

I realize that IUMRS is also a big international group, with IUMRS presidents, secretary general, officers and presidents of the adhering bodies as the key ties of this large group.During my two years serving as IUMRS president, I took the opportunities of going abroad to attend conferences to meet the friends in E- MRSMRS-Japan and MRS. Besides discussing matters of the societies, we have also undertaken a number of bilateral activities; correspondingly, many of them, such as Paul Siffert, Masao Doyama, R. P. H. Chang, Peter Glasow, Robert Nemanich, Gabriel Crean, B.V.R.Chowdari, John Baglin, Elton Kaufmann, Hiroshi Yamamoto et al, have become my good friends. This has become a great pleasure of my life. For me personally, it is an important part of my life. I will remember all the friends I knew in the international materials community!

I regret that in 2006 at the end of my term as IUMRS president, because I suffered from cancer and made a liver transplantation operation, I was unable to attend the Nice meeting, some of my suggestions had been forwarded by Gabriel Crean and Yafang Han, here I extend thanks!

Besides, I would also like to extend my thanks to Rob-

ert Nemanich, who served as IUMRS President just before me. My special thanks should also be given to Prof. Bob Chang. He is one of the initiators of IUMRS, has worked as IUMRS secretary general for many years, and made great contributions to the development of IUMRS. I have known him for many years, and he has given me and C-MRS lots of help.

May IUMRS have a greater prospect!

Memorable Experience Serving for 4 Years IUMRS Treasurer

By Jain-Long Horng, MRS-Taiwan

Since 2004, I have served as Secretary General of MRS-Taiwan for more than 15 years. During this period,we had the opportunity to hold ICA meetings in 2011 and 2017, and hold ICEM meetings in 2014 respectively. Because of the IUMRS International Conference and related activities, it increases the exposure of MRS-Taiwan among the international material community and also enhances the interaction between domestic and international scholars.

During the period of 2015-2019, I served as Treasurer in the IUMRS Executive Council. Due to the increased interaction with the presidents and key members of the adhering bodies, it will help promote the multinational material activities. By participating in the function of the IUMRS platform, the material conferences held by various member groups provided more opportunities for material knowledge exchanges. Many visiting arrangements among MRS-J, MRS-K, MRS-S and C-MRS had been made. Especially with C-MRS many additional bilateral conferences and visiting have been arranged.

To memorize the past, we should appreciate Professor Bob Chang of Northwestern University far-sighted to initiate to build the IUMRS 30 years ago. He combined the seven material group leaders of Chinese, Japanese, Korean, European, Singapore, United States and Taiwan to set up this important material organization.

In these recent three years, Indonesia andThai Materials Society joined IUMRS as full members, and had also started and organized ICA meetings since then. It is good anticipation to foresee more emerging member groups to join IUMRS, and it also highlights the strong growth and important role of more emerging countries they can play, especially in Asia.

Unforgettable Memories of My Service for IUMRS

By Prof. Soo Wohn Lee(President of IUMRS, 2017-2018)

Prof. Soo Wohn Lee

When the presidentship starts, every president of the IUMRS sets up its own vision and plans for the next two years. I currently see two important issues with the IUMRS. The first issue is to make IUMRS financially strong as compared to the IUPAC and the IUPAP. The IUPAC and the IUPAP had a long history and have many academic members as well as global industry members. However, the budget of the IUMRSis very small depending on the annual dues and some donations after the IUMRS ICAM or ICEM conferences. The second issue is how the MRS can reunite the adhering body member of the IUMRS since the MRS has moved out from the IUMRS in 2013. Bringing MRS under the umbrella of IUMRS is important because most of the activities of materials research has been done by the MRS. Also, the majority of the participants at the annual meeting of the MRS are from Asian countries such as Japan, Korea, China, Singapore, Taiwan, Thailand and India.

My international trips in 2017-2018 included more than 40 multiple visits to the USA, Canada, Mexico, Peru, Argentina, Venezuela, Brazil, South Africa, Botswana, India, Singapore, Thailand, Indonesia, Nepal, Vietnam, Taiwan, Uzbekistan, Japan, China, Russia, Finland, Germany, France, England, Italy, Portugal, and Australia. These visits were partially aimed to solve the above two issues of the IUMRS in my presidential tenure. Early January in 2017, I had visited Professor Bob Chang to share the ideas of the future of the IUMRS. One of the big issues was

to move the IUMRS head office from Evanston, USA to another place possibly in China, Singapore, or France. We discussed this issue for 2 hours at a small restaurant, in Evanston. It was thought that he agreed to move the IUMRS head office due to his age and his research finance situation. One staff has already left his office and now only one staff is working with him. In 2016, I visited Brussel to join the IUMRS GLOBAL LEADERSHIP AND SERVICE awards ceremony. IUMRS GLOBAL LEADERSHIP AND SERVICE AWARD Candidates are stakeholders or policymakers who have made significant contributions to the promotion of science, for example, by attracting sponsorship for science. It recognizes leaders in the materials science community who have dedicated their capabilities and talents to serve the greater good and impacts the world-at-large. We stayed at the same hotel there. In the early morning, I asked Professor Paul Siffert to talk for 30 minutes about the future of the IUMRS. I promised that I will reform the IUMRS within two years. The first thing to be done was to move the IUMRS head office to activate the IUMRS because there have been big arguments about the position of the general secretary of the IUMRS after the Qingdao meeting in 2013. It was suggested to him that the IUMRS head office will be moved to another city from Evanston. The second issue was that the MRS will be requested to rejoin the IUMRS. After the GA meeting in Nice in 2011, the MRS sent a letter to the then President of IUMRS (Professor Osamu Takai in Nagoya University, Japan) that the MRS will not be adhering body of the IUMRS. Since receiving the letter, nobody has tried to discuss with MRS officers to request the reunion. The IUMRS World Materials Summit conference in Strasbourg, France on November 20-21, 2017 was also joined and delivered a congratulatory speech to the conference audience.

ICMAT 2017 Conference, Singapore

Yuan Ping Feng, the secretary of the IUMRS, sent us the following schedule: There were some details about the coming IUMRS meeting in Singapore, on 18 June, immediately before ICMAT 2017.

14:00 – 18:00 IUMRS planning workshop at Room 307, Suntec Level 3, Temasek Blvd, Singapore 038984 (ICMAT 2017 Conference Venue), MRS President Susan Trolier-McKinstry joined the meeting at approximately 16:00

18:00 – 20:00 Dinner hosted by MRS Singapore, in La Brasserie in Fullerton Bay Hotel. Bus transport was available from Suntec to Fullerton Bay Hotel.

Rodrigo and Jim Williams suggested the following topics which we discussed on June 18 in Singapore:

1. Global Education and connections of IUMRS with European Initiatives

2. Global Leadership and Service Award: definition of next initiative and place to take place (2018/2019)

3. Report on the program for the World Materials Summit in Strasbourg in November in which IUMRS (through the Meetings Commission) has had a big role in organizing.

4. Nowthat Elton Kaufmann has resigned as Chair of the Development Commission a discussion of how we might appoint a new chair until we can discuss the matter further at the next General Assembly meeting in Kyoto.

We did discuss further additional topics on June 18. YasuroIkuma, the chair of the IUMRS-ICAM provided the information about the IUMRS-ICAM2017 conference as well as the IURS General Assembly meeting. SooWohn Lee encouraged adhering bodies to invite officers and representatives from MRS and offer a registration fee waiver for two participants, when they organize IUMRS meetings and hope MRS can do the same for only 2-3 IUMRS officers. However, Suzan pointed out that due to different policy, MRS need to discuss. If the board changes the policy for this, it would be included in the budget for the approval. It would be useful if a special collaboration can be proposed and a proposal be prepared for approval. Hanns-Ulrich Habermeier added the details of secondary importance. It would be an important step if MRS representatives can attend the IUMRS General Assembly which is not necessarily reciprocal. It is the personal relation and confidence that counts.

IUMRS EC members with the president of the MRS, Suzan at the ICMAT MRS-Singapore on June 18, 2017

C-MRS 2017 Annual Meeting, Yinchuan

The opening ceremony of the C-MRS annual meeting on July 13, 2017, in Yinchuan, China.

In hot and humid summer of July 13, I flew to Xian and delivered a technical presentation on transparent ceramics at the Xi'an Jiaotong University, and then we took a night train to Yinchuan where the C-MRS annual meeting was held. I was a VIP and delivered a congratulatory speech to thousands of material researchers in China. The C-MRS is a leading society and the research activity such as publications and academic meetings are so nice nowadays. Also, MRS-J, MRS-K, MRS-T are very active. These Asian societies of the IUMRS will enhance the scientific and technological as well as manufacturing capacities. But we should consider the environmental pollution and all MRS members are supposed to contribute to solving this environmental problem as well as climate change. Recently, the average temperature was extremely high in Europe, the USA, and Asia (Korea, Japan and India). During dinner time, many of my Chinese friends appreciated my great speech. There is not so huge change in the activity of the IUMRS in Europe, but there is a big wave of movement in Asia among China, Japan, Korea, Taiwan, and Singapore, Thailand.

MRS-Mexico 2017, Annual Meeting, Mexico

MRS-Mexico President, SooWohn Lee, and other officers at the August 20, 2017, IMRC meeting in Cancun, Mexico.

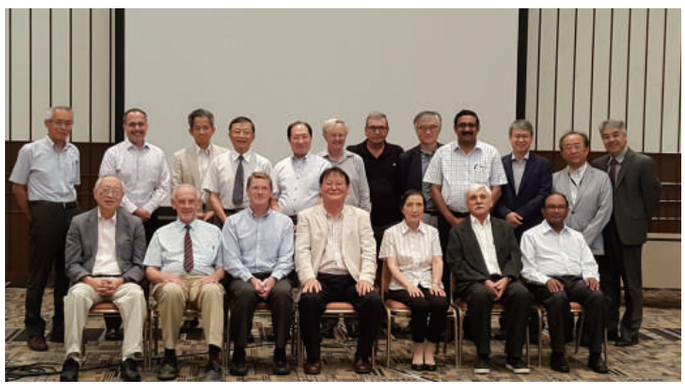
Past president of the MRS-Mexico, MRS-Mexico President, SooWohn Lee, and other officers at the August 20, 2017, IMRC meeting in Cancun, Mexico.

In a humid and shining beach of Cancun, Mexico, the MRS-Mexico annual meeting was held in Marriot hotel by Claudia Elizabeth Gutiérrez-Wing, who is the elected president of the MRS-Mexico. The officers of the MRS-Mexico as shown in Photo 3 are working very hard for the conference. I joined the opening ceremony and talked to Susan Trolier-McKinstry who is a professor at Pennsylvania State University and the president of the MRS. Also, I met the executive director, Todd Osman. I asked Suzan to have breakfast together and she agreed. In the early morning in Cancun beach, she came with Todd and we discussed many issues of the IUMRS and activity in Asia. I suggested to both of them to join the IUMRS meeting and conferences in Asia and other countries. They said that it was a great idea. The Cancun meeting and conference were so exciting and took several photos with the president of the MRS-Mexico and officers of the MRS-Mexico as shown in Photo 3 and past presidents of the IUMRS-Mexico, respectively as shown in Photo 4. I asked

them that the MRS-M members should join the conferences in Europe and Asia and invite more Asian scientists as the plenary speakers in Cancun meeting and also to make dual symposium among Asian and Mexico in various areas such as photocatalysts, Li-battery, solar cells, fuel cells and in the energy area. I also asked them to pay annual dues from 1,000 to 5,000US$ near soon.

IUMRS-ICAM 2017 Meeting, Kyoto, Japan

The past President of the MRS-Japan, Professor YasuroIkuma at the Kanazawa Institute of Technology organized the IUMRS-ICAM2017 at Kyoto University, in Kyoto, Japan. Kyoto was an old capital of the Japanese Empire, and there are many historical temples and shrines in Kyoto area. On the morning of August 26, 2017, we had an EC meeting and in the afternoon we hold GA meeting. The elected president of the MRS, Sean Hearne, and MRS executive director, Todd Osama were invited by SooWohn Lee to the GA meeting and discussed for the collaboration between the IUMRS and the MRS. The EC meeting and GA meeting respectively accepted the application of the IUMRS membership to the MRS-INA and MRS-Thailand. John Baglin, membership commission chair will provide the application form as well as the guideline of the requirement of the IUMRS Membership application. Later John received all required documents from Indonesia and Thailand, which in two months were passed for the membership qualification to two new brand IUMRS members.



2018 IUMRS EC members, August 26, 2017, in Kyoto.

Dinner time with IUMRS members in Kyoto, on August 29, 2017.

Brazil-MRS 2017, Brazil

On May 13, 2017, Osvaldo Novais De Oliveira Jr sent us (Han, Feng, Chang, Chowdari, Martins) the following e-mail:

Subject: Brazil MRS Meeting

Dear SooWohn and colleagues,

I am writing to remind you about the deadline for submitting an abstract for the B-MRS-Meeting (deadline 19 May 2017). Also, when you have your flight details, please let me know so that we can organize a transfer from the airport in Porto Alegre (POA) to Gramado where the meeting will take place.

There is an official travel agency which will take care of additional sightseeing or any other tour you may wish to take before or after the

B-MRS Counsel Members on September 12, 2017

meeting. As for the hotel in Gramado, the recommendation is Hotel Serra Azul.

Earlier, at the IUMRS ICA 2016 meeting in Qingdao, China, I inquired the following person and they agreed to attend the annual meeting of B-MRS on September 10-14, 2017 for the IUMRS to encourage the activity of Latin America MRS through a cooperation with the IUMRS leaders: SooWohn Lee and his wife, Bob Chang, Yafang Han, Yuan Ping Feng and his wife, Chowdari and his wife, Rodrigo Martins and his wife, YasuroIkuma and his wife, Paul Horng and his wife.

Latin America MRS on September 13, 2017 (at 6:00 PM).

Me and my wife Myong Sook Lee, Bob Chang, Rodrigo Martins and his wife Elvira, Claudia Elizabeth Gutiérrez-Wing (president of the MRS-Mexico), and Professor HyungTakJeon (president of MRS-Korea) arrived at a mountain town in Gramado after a very long trip. Even though it was very far from San Paul and Rio, more than 2000 participants attended the B-MRS annual meeting. It was a very successful conference. Osvaldo arranged a meeting for me with all the B-MRS directors as shown in Photo 7. And Osvaldo invited a dinner for IUMRS EC members at an Italian restaurant with many southern Latin American scientists from Peru, Ecuador, Bolivia, Argentina, Chile, and Mexico. On the other night, I invited all of the same Latin American leaders. Particularly two young scientists of metallurgy and physics coming from Peru were very enthusiastic. As shown in Photo 8, I joined the Latin America MRS leaders meeting and delivered a speech of the IUMRS activity. This kind of relationship between the IUMRS and B-MRS has been developed by Professor Bob Chang's long-term strong efforts. I truly appreciate Professor Bob Chang.

ICSU 2017 Meeting, Taipei, Taiwan

ICSU meeting in Taipei, oct., 2017

Clustering Meeting in Ambassador Hotel, Taipei on October 21, 2017.

The ICSU and the ISSC had been discussed for many years about how to combine these two communities. Natural science and social science are so different fields. If they combine, the fusion synergy effects will be huge in the future for global scientific issues. The Taipei meeting was planned for the announcement of combining these two communities via voting. The first meeting of the ISC, a new name after combining the two organizations, would be decided by voting to be held in Paris rather than in Kyushu, Japan as shown in Photo 9.

Hanns-Ulrich Habermeier, Chowdari, Paul Hong, Professor Han and myself attended this ICSU meeting in Taipei, and we had a UnionClustering meeting of Mathematics (IMU), Physics (IUPAP), Chemistry (IUPAC), and Materials (IUMRS) as shown in Photo 10. We agreed to prepare a proposal to UNESCO for a new paradigm issue.

The first MRS-Indonesia 2017 conference, Yogyakarta, Indonesia

Opening Ceremony of MRS-INA at the Sahid Jaya Hotel, Yogyakarta, Indonesia on October 9, 2017.

Leaders of the MRS-INA.

It is the first international conference in Yogyakarta, Indonesia, which was joined by the neutron diffraction community and materials science community. This time was my first tour in Indonesia. Through the international airport of Jakarta, it was a big airport and the transition from international to domestic was so nice and kind to the travelers. When the airplane landed in Yogyakarta, it was an old and small airport terminal like a personal private house. Someone picked me at the airport and dropped me with other invited foreign speakers to the Sahid Jaya hotel in Yogyakarta. Evvy Kartini, the president of the MRS-Indonesia was waiting for us in the front of the hotel. She did a great job to organize very successfully the first MRS-Indonesia conference with her own family, daughter, father, and mother helped all foreign speakers. Her father was a Supreme Court judge in Indonesia.

Neutron diffraction community was so tight each other. There are many things to learn using neutron sources from Australia, Germany, China, Korea, the USA and Japan, Mexico, Brazil. Particularly J-PARC in Japan was an outstanding group to open summer school for foreign students to teach neutron technology as well as making global networks among young generations from around the world. The funding was provided by the J-PARC program. The new membership of the IUMRS was delivered to the president of MRS-Indonesia during the opening ceremony. All participants after the opening ceremony were taken a memorial photo together as shown in Photo 11. The key officers and directors of the new MRS-INA asked me to take photos with Professor Chowdari who had been helping for the foundation of the IMRS-INA with Evvy Kartini for a decade.

Evvy Kartini arranged very good culture tours in Hindu shrine and Buddhist monastery which are scattered in the area of Yogyakarta, I learned the fusion of cultures from historical shrines and temples located in the area of Yogyakarta, as well as the fusion of social science and natural science from the architectures of temples and shrines which were built before 5th century here in Yogyakarta, Indonesia.

MRS-Thailand 2017 Meeting Chiangmai, Thailand

I left home very earlier and waited in an express train station in my town to get a direct KTX train from my home station to Incheon airport station in Korea, But I was so confused to wait for a different train, and then I had missed the KTX train from my home station to Incheon airport station and therefore I could not get the direct flight from Incheon to Chiangmai. I called my wife to pick up me at the train station, and returned home and booked another flight from Incheon to Bangkok and Bangkok to Chiangmai in the next days. Of course, I did double payment for changing flights. Maybe frequent flyers sometimes face this kind of situation. It was a very long lane to pass through the passport control box in Bangkok airport. However, it was a very good and memorable trip through Bangkok. The

conference place was the same hotel, which I had organized ten years ago for the very successful ISEPD conference. I met many young material scientists in Thailand who are helping each other and making good collaborative networks. Santi, the first president of the MRS-Thailand, was a great leader and his wife was also a good contributor to the MRS-Thai even though she is a professor in the Biology department. The first MRS-Thailand international conference was so successful and invited many other foreign speakers from the USA, Europe, and Asia through their various academic networks. As shown in Photo 14, they were so delighted when I delivered a plaque of the IUMRS membership to Santi, the president of the MRS-Thailand during the opening ceremony like in Yogyakarta, Indonesia.

MRS-Thailand Conference in Chiang Mai, Thailand, on October 31 - November 3, 2017.

Delivering the membership of the IUMRS to Santi, the president of the MRS-Thailand.

Africa-MRS 2017 Conference, Botswana

Four years ago in 2013, we had joined the Africa-MRS in Victoria Fall city, Zimbabwe with professor Chowdari and Yuan Ping Feng together from the IUMRS. Professor Chowdari was the president of the IUMRS in 2013. After the Victoria Fall meeting, the Africa-MRS organized a conference in Addis Ababa, Ethiopia. I was invited to join the conference, but there was an overlap with my other schedule. I, therefore, missed the great conference in Ethiopia. Dr. Samuel Chigome at the Botswana Institute for Technology Research and Innovation (BITRI), was a secretary of the local organizing committee of the 9th International Conference of the African Materials Research Society which was held at the Gaborone International Conference Center in Gaborone, Botswana, December 11-14, 2017. Samuel continuously asked me to join the Africa MRS meeting through many e-mails for a year. Now Samuel is serving the president of the Africa-MRS. I asked my wife to join, but she refused. Only professor Chowdari had done other schedule in South Africa. He joined the Africa-MRS after his other business in South Africa. It was a little

After opening ceremony in December 11, 2017.

cold at midnight in Singapore airport when I was there for transit to Johannesburg. When I landed in Johannesburg airport and waited for 6 hours for the connecting flight to Garbone, Botswana. I had a high fever and headache and felt cold. When I was in the airport in Botswana, it was a very hot sunny day. But, I was still feeling so cold. As a president of the IUMRS, I delivered a special speech on the activity of the IUMRS to all Africa MRS community during an opening ceremony. After the opening ceremony we took a photo with then vice president (now President of Botswana) and important ministers of Botswana as shown in Photo 15. I asked Professor Kenneth I. Ozoemena at the University of Witwatersrand, Johannesburg, to have dinner with the key person of the Africa-MRS. Kenneth arranged a dinner table in a Chinese restaurant inside the conference hotel. I introduced Professor Chowdari to them and discussed how to develop the activity of Africa-MRS near future. But I could not meet Samuel Chigome in Goborone and flew back home. Professor Maaza, who was very active and joined many conferences in the Asia region, was very bad shape after he was shocked and the left side of his body was paralyzed. It was not a good organization of the conference because of the absence of many speakers.

IUMRS dinner for Africa-MRS members with Chowdari, Kenneth I. Ozoemena at the University of the Witwatersrand, Johannesburg, Dr. Farce Tico M. Therma at the Intercom, Bostwana, SooWohn Lee, Professor, Dr. Musa Chacha at the Nelson Mandela Africa Institution of Science and Technology in Tanzania, HuldaShaidiSwai at the Nelson Mandela Africa Institution of Science and Technology in Tanzania, and Prof. M. Maaza at NRF iThemba Labs, South Africa.

MRS 2018 Annual Spring Meeting in Phoenix, Arizona

The MRS sent an email to invite the IUMRS EC members to Phoenix, Arizona, where the MRS Annual spring meeting was held. The president of MRS, Sean Hearne, invited us to discuss the issue of the IUMRS. Professor Han Yafang, Rodrigo Martins, Elvira Martins, Claudia Elizabeth Gutiérrez-Wing, and I joined the meeting. Sean Hearne, Mike Fitzsimmon, and Todd Osman joined with us, and the current president of MRS-Brazil, Professor Monica Cotta was also there. We did chattering and drinking wine to celebrate the activity of the MRS and the activity of the IUMRS. We hopefully suggested that the MRS can reunite with the IUMRS. However, Todd said there were some problems between the IUMRS and the MRS. The MRS can have cooperation in education and workshops with the IUMRS. I prepared the meeting minutes (Appendix I) of the Phoenix trip to Rodrigo and Sean. I hope that the MRS will reunite with the IUMRS if the IUMRS becomes a very strong organization.

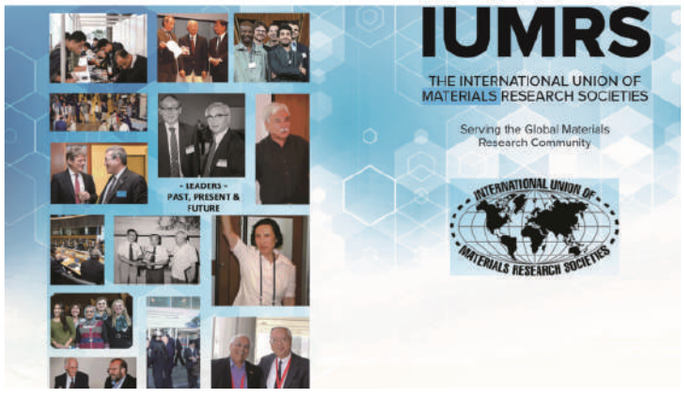
UNESCO meeting and ISC meeting, 2018, Paris, France

Professor Sanjay Mathur at the Cologne University, Germany, had asked me to present my recent research works for his students as well as his faculty members at the Department of Inorganic Chemistry, Cologne University. After arriving at the Frankfurt airport, I slept overnight at the Intercontinental Hotel in Frankfurt, and relaxed in the morning and took a train from Frankfurt train station to Cologne train station in the afternoon. Students of Cologne University picked me at the train station and dropped me to a hotel, which was very quiet in a small town far from the downtown in Cologne. After my presentation at Cologne University, I flew from Frankfurt back to Paris.

The Hotel Des Nations Saint Germain, 54 Rue Monge, in Paris had been booked on February 19, 2018, by John Baglin. Unfortunately, John could not join the Paris meeting due to his wife Coral's health conditions. Coral had been suffering from rapidly advancing Alzheimer's disease. John said that Coral's condition has declined in recent weeks, and at this time, he must have to stay home.

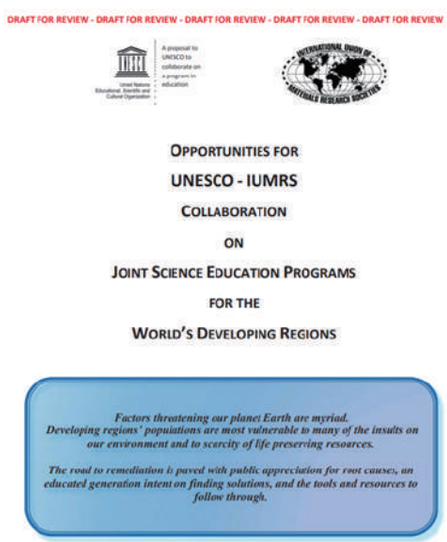
The hotel room was relatively very small like in Japan but the room was air-conditioned. Professor Chowdari

and I had breakfast together in the cafeteria the next morning and discussed how to cooperate with UNESCO on that day's meeting. John planed to create an updated version of the poster that we displayed at the Meeting of the Unions last year. There would be no posters this time, but this would be printed as a 1-page handout that tells all about IUMRS, to be placed on a table provided for such handouts. Alternatively, we could simply update the draft of the IUMRS brochure that Elton Kauffman recently produced for our UNESCO introductions. This would need to be professionally printed and stapled, on thin paper (a ten-page brochure). Thirty copies of the IUMRS brochure and flyer were brought to the UNESCO in Paris.



IUMRS brochure.

Earlier on November 20-21, 2017 in Strasbourg, France, at the 6th the World Materials Submit meeting, I had met Professor M. Martiale G. ZEBAZE-KANA, who was a chief of the section for capacity-building in Science and Engineering within the Natural Science Sector of the UNESCO in Paris and we had also taken a photo together after his speech. After the Strasbourg meeting, I contacted him by e-mail on how to make a productive educational collaboration operation between UNESCO and IUMRS. One day, Paul Siffert asked me to prepare a proposal to the UNESCO and inquired whether the IUMRS has soldiers to prepare the proposal. I did say yes, we have. We hoped that the UNESCO will be interested in exploring such a collaboration. I sent a mail on January 3, 2018 to Ms. Audrey Azoulay, Director-General of UNESCO. On behalf of the Director-General, the Assistant Director-General for Natural Sciences, UNESCO, Flavia Schlegel returned me a mail for my letter of 3rd January by which the IUMRS expressed its interest in working and collaborating with UNESCO on the basic sciences. She said that I should contact Martiale for the collaboration. We have many excellent soldiers to collect the information and to prepare a brochure of the IUMRS and the flying of the IUMRS. I asked Bob Chang, Rodrigo Martins, Yafang Han, John Baglin, and Elton Kauffman to send me the information of the IUMRS, which will be an IUMRS brochure and a proposal to the UNESCO. John collected a lot of information and Elton made a good brochure (Photo 17) and a proposal to UNESCO (Photo 18). Sean Herans sent me an article of the education program in Africa of the Joint USA-Africa Materials Institute (JUAMI; MRS and MRS-Africa are both sponsors and participants in this effort). The first JUAMI school was held in Addis Ababa, Ethiopia, from December 9 - 21, 2012. Professor Yafang Han sent me three files of Chinese researchers on the water pollution including the work of Zhejun Liu, et al., Global Challenges, 2017, on 'Extremely Cost Effective and Efficient Solar Vapor Generation under Nonconcentrated Illumination Using Thermally Isolated Black Paper', which was included in the Advanced Science News program of the IUMRS. Also, I asked Professor and vice president Ben Hsaio of at the State University of New York, to whom I met at the Africa-MRS meeting in Botswana, December 2017, to send me a file of his water program in Kenya, Africa. Elton made an excellent brochure with this information. Finally, Professor Han made 100 hard copies of the IUMRS brochure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OPPORTUNITIES FOR
UNESCO - IUMRS
COLLABORATION
ON
JOINT SCIENCE EDUCATION PROGRAMS
FOR THE
WORLD'S DEVELOPING REGIONS

Factors threatening our planet Earth are myriad. Developing regions' populations are most vulnerable to many of the insults on our environment and to scarcity of life preserving resources.

The road to remediation is paved with public appreciation for root causes, an educated generation intent on finding solutions, and the tools and resources to follow through.

A proposal of opportunity for UNESCO-IUMRS Collaboration for Joint Science Education Program.

Meeting in UNESCO, Paris, on July 2, 2018.

and flyer, which I brought to UNESCO in Paris. In the afternoon of July 2 (at 2:00 PM) we had an official meeting between the IUMRS and UNESCO as shown in Photo 19. Chowdari and Habermeier joined with me and had some trouble to find out the entrance place of the UNESCO buildings after using a subway in Paris. The E-MRS members Paul Siffert, Jeanpierre Massue (living in Paris) were among to meet the UNESCO people, and Amouroux also joined together. Martiale and his staff discussed with three IUMMRS members and three E-MRS members. Martiale suggested the IUMRS can do some works for basic science program of the UNESCO, but do not have any budget to provide to the IUMRS. Paul and E-MRS expected some sort of funding from the UNESCO program.

E-MRS can be a major player with the UNESCO because it is geographically inside France. We agreed with Paul's idea, but it seemed to me that the UNESCO meeting was for the E-MRS, not for the IUMRS. Even after the meeting at UNESCO, we did not say bye and left without any things, even there was no coffee time for discussing the UNESCO strategy in the future.

We left for the Clustering meeting of the International Science Council (ISC) members, everyone taking the same subway. It was a very hot summer afternoon and met all UNION clustering members. Michel Spiro, professor at the École Polytechnique was also the president of the French Physical Society from 2016–2017 and president-elect for the International Union of Pure and Applied Physics (IUPAP) as of 2018. In October 2019 Spiro was asked to replace IUPAP president Kennedy J. Reed who wanted to step down for personal reasons. Michel Spiro invited us a dinner at dark historical restaurant without air condition which was a further 80-meter walk to the Cluster venue (both on Rue Saint Jacques). They said that many restaurants in Paris did not have air condition.

Founding General Assembly of the ISC held at La Maison des Océans (Institutocéanographique).

As shown in Photo 20, the Founding General Assembly of the International Science Council (ISC), following the merger of ICSU and ISSC, took place on 3-5 July 2018 in Paris, France. The event was hosted by the ISC Member Organization in France, the Academy of Sciences of France. The 3rd of July was devoted to the Members' Fora. The official opening of the General Assembly took place on the morning of the 4th of July. The day was dedicated to the election of the first Governing Board and discussions about the first steps for the new organization. On the 5th of July, the inaugural scientific event of ISC was held, with eminent guests and speakers. The General Assembly was held at La Maison des Océans (Institutocéanographique)

195, rue Saint-Jacques 75005. On July 3, at the Opening of the General Assembly, HSH Prince Albert, the Sovereign Prince of Monaco Gordon McBean, President of ICSU, Alberto Martinelli, President of ISSC, and Catherine Bréchignac Secrétaireperpétuel, Academy of Sciences, France, did the outstanding speech. The General Assembly is a closed meeting for Members [Member Organizations (140) and Member Unions and Associations (40)] and about 350 invited participants (Interdisciplinary Bodies, Affiliate Members, key partners and observers). The Assembly, including two Members' fora, lasts for three to four days and is normally preceded by a science day organized by the host country. The Governing Board and a small number of other committees also meet just before the Assembly and immediately after. Provisions should be made for a scientific event to be co-organized by the host and the ISC Secretariat. In the afternoon, we did the election of Officers of the Governing Board and heard presentations by candidates for Officers: President, President-elect, Vice-Presidents, Secretary, and Treasurer. After the election of Officers, at 19.30-22.30 we joined the Cocktail Reception and Concert at the Académie des Sciences, Palais de l'Institut de France, 23 Quai de Conti, 75270 Paris. At 16:30-17:00 of July 4, presentation of bids was held and the date and place of the 2nd GA and call for invitations to host the 3rd GA in 2024 were announced. Professor Reddy Daya at the Department of Mathematics of the Capetown University, South African 1953 (NatSci (maths) CAST/IMU/IUHPST ICSU both) was selected as the first president of the ISC. We also voted for the next ISC meeting in Oman, not in Canada. Most of the delegation expected the voting would favor Montreal, however, the voting result was in favor of Muscat, Oman in 2021. The ISC meeting is held every 3 years. I requested the Korean Government to host the 2024 ISC meeting in Seoul, Korea, and the closing ceremony in Pyongyang in North Korea. But nobody was interested in the ISC meeting in Korea.

IUMRS ICEM 2018, Daejon, Korea

During the GA meeting of the IUMRS-ICEM 2018 in Daejeon, Korea.

A group photo in front of SooWohn Lee's house after the industry trip of the IUMRS-ICEM2018.

Before the IUMRS ICEM meeting, there were two days of meetings; EC meeting on Saturday and General Assembling meeting on Sunday. On the evening of Sunday, the official welcome party was arranged. After the GA meeting, most of all GA members enjoyed the welcome party together. Professor Han could not sleep overnight due to the request of President of the C-MRS.

The big hot potato was to decide whether to move the IUMRS head office from Evanston to Singapore. But C-MRS insisted to host the head office in Beijing. Professor Han and Professor Chowdari agreed to move the head office in Beijing for two years and to open finance in Singapore. After 2 years, the head office will move to Singapore for 5 years. This statement was signed by myself, professor Han, professor Chowdari, and Habermeier (immediately past president of the IUMRS).

One of 3 copies was given to C-MRS, MRS-Singapore, and IUMJRS secretary. But we acknowledged Professor Bob Chang for his long term contribution and even founding the IUMRS in 1989. After the GA meeting, we had a group photo as shown in Photo 21.

Also, I arranged industry tours in the Hyundai steel company in the morning and Hyundai Automotive company in the afternoon. We had lunch at a cafeteria of the Hyundai steel company. The food was a normal menu for the engineers of the Hyundai steel company. We looked at all processing from Iron ore storage, blast furnace, hot rolling, to cold rolling steel plate as well as the galvanizing process. Before dinner, every industry tour member visited my house and took a group photo as shown in Photo 22.

IUMRS ICA 2018 conference, Bali, Indonesia

At the University Hall after the IUMRS-ICA 2018 in Bali.

A tour of the IUMRS-ICA in Bali.

The IUMRS ICA 2018 meeting was held for the first time in Indonesia from October 31 to November 2, 2018, in Bali. All of the IUMRS EC members participated in the IUMRS ICA 2018 conference and did celebrate the MRS-INA. Bali is very famous to global tourists. Bali has many beautiful beaches, various local shopping places as well as great Polynesia style restaurants. Also, it has so good weather as it is near the equator. So many Australian can enjoy here in Bali for vacation. After the IUMRS ICA meeting, we moved to a local university in Bali and presented the IUMRS as well as the technical presentation at a campus auditorium for local students as well as university faculty members who could have good cooperation in the future. It was so exciting conference and activity in Bali ash shown in Photo 23. The MRS-Indonesia can be stronger by supporting young Indonesia students. EvvyKartini arranged a great local group tour program for a half-day as shown in Photo 24.

MRS-Japan 2018 annual conference, Kitakyushu, Japan

Professor Somiya at the Tokyo Institute of Technology passed away this summer. He was a founding member of the IUMRS in 1989. Professor ShikeyukiSomiya organized many conferences of the IUMRS and supported the founding of IUMRS members in Korea and Singapore. Professor Yoshimura asked me to join the Somiya Memorial Symposium at the MRS-Japan Fall meeting in Kitakyushu, Japan. I flew through Fukuoka airport and took a limousine bus from Fukuoka airport to Kitakyushu station; it takes one and a half-hours. After checking a hotel and attending the memorial symposium, there were only a few people in the lecture room. Professor Bob Chang was a key speaker, but he was absent and sent his presentation file to an organizer. I prepared a technical presentation of transparent ceramics because Professor Somiya was a scholar in the area of zirconia ceramics. Most of the presenters talked about professor Somiya's life. I changed the topic as the activity of the IUMRS. Even the president of the MRS-Japan, Takahara did not join this Somiya memorial symposium. In the early morning of the next day, I took a limousine bus from Kitakyushu station to Fukuoka airport and flew back home after rebooking my flight. I felt so sorry for the loss of Professor Somiya.

Report of the African MRS Conference trip on December 8-16, 2019 in Arusha, Tanzania

Kilimanjaro International Airport

Registration of the 10th African MRS in the NM-AIST.

It was a beautiful sunny afternoon of 9th December 2019 when the airplanelanded on the “Kilimanjaro International Airport” stretching across the shining African bushes of Arusha, Tanzania. The Tanzania visa processing was very simple because of the electronic visa that had been appliedthrough a web of Visa HQ. The e-visa was issued within 5 days after applying through the web. The visa costs 107 US $. As we arrived at the airport, we received warm greetings from a staff holding a display with our name.

We then traveled to a hotel“Four Points by Sheraton” in Arusha city by bus. There were only two lanes on the road from the airport to the hotel.The road was extremely busy due to transport trucks on both lanes. The driver named Ezielkel was a nice person. He provided many interesting and useful information about African life.

It was almost 6:00 PM when I checked in at the hotel. It was a 20 hours long trip through Doha, Qatar from Incheon Airport, from where I departed at midnight (00:35). After check-in, I, therefore, fell a sleep immediately due to the exhausting trip.

Next day, I woke up very early (5:00 AM) and had a simple breakfast at 6:30 AM on the nice decent cafeteria of the hotel. I checked the front desk to get information on the shuttle bus to the conference place. They put an announcement on the table. They said that we would leave at 7:00 AM. I had only a minute and asked the driver to wait for me for 2-3 minutes to bring my notebook as well as other stuff from the hotel room.

I was surprised that the shuttle bus moved to adifferent destination, not towards the Arusha Convention Center. The bus stopped infront of the NM-AIST (Nelson Mandela Africa Institution of Science and Technology) in 30 minutes traveling through the unpaved muddy road. Later on, I heard that it was due to the small number of participants, the venue for the conference was changed. Unfortunately, it was unknown until arriving at the NM-AIST.

The registration queue was long enough. The opening ceremony of the 10th African MRSwas scheduled at 8:30 AM in the main conference hall of the building. However, the opening ceremony was delayed to 8:50 AM. Dr. Revocatus Manchunda was the rapporteur of the opening ceremony. He introduced Professor Hulda Shaidi Swai was the president of the Africa-MRS. Currently, she is an associate professor in the School of Life Science and Bio-engineering and also a director of Science and Technology in the NM-AIST. Professor Swai officially announced the opening of the 10th African MRS conference, and she introduced the Deputy Minister of Science, Education and Technology, Tanzania.

And there was a welcome address session where Professor Emmanuel Luoga, Vice-Chancellor of NMAIST and leader of Arusha Regional Commissioner (MrishoGambo) welcomed the delegates. Finally, Deputy Vice-Chancellor for Research and Innovation, NM-AIST, Professor Anthony Mshandete delivered a “vote of thanks.”

Most of the key VIPs were sitting in the front line of the table on the stage, and all participants were listening

Group photo of the 10th African MRS Conference, Dec. 2019

to their speech. They introduced the Africa Institute of Science and Technology in various countries and encouraged scientists to carry out research on water purification and nanotechnology in Tanzania as well as in the whole of Africa.

After their speech, a group photo was taken in front of the main building of the NM-AIST.

After the group photo, three plenary speakers delivered their talks for 30 minutes each. The first plenary speaker, Professor Joseph Mode of Northwestern University presented the wireless biosensors for the newborn babies. The CBS TV broadcasted their team's research activities in a hospital in Chicago.

The second plenary speaker, Dr. Askwar Hilonga was a young associate professor of the NM-AIST. He was very successful in establishing his spin-off company called "Nanofilter." He was born in a local town near Ngorongoro Crater in an un-privileged family. His father could not even support his education for the secondary school level.But Hilonga completed a Ph.D. degree in Chemical Engineering at the Hanyang University Korea in 2012 and returned to his country Tanzania as an assistant professor of the NM-AIST. Once he asked 7,000 USD to the chancellor of his University without a contract and was very successful to make a spin off-company. He discovered an idea for a simple and cheap method to clean the water using nanotechnology because he carried out the research on the membrane system at Hanyang University for 3 years. He worked very hard to commercialize the clean water system which he developed and contributed to his poor community. That was his milestone breakthrough for African people to offer clean drinking water free from contagious waterborne disease-carrying bacteria such as cholera and E-Coli. Now, he has many collaborations from various places. He now owns a company called "Nanofilter" in Arusha with 30 employees. His success story has inspired many people in Europe and mid-Asia.

The third plenary speaker, Professor Nelson Torto, director of the Africa Academy of Science (AAS), who was the president of the 9th Africa–MRS Conference in Gaborone, Botswana on December 9-14, 2017, introduced the successful proposals from African Scientists to the AIST. He was the founding CEO of the Botswana Institute for Technology and Innovation (BITI), which values co-creation and empathy.

There was a lunch break from 12:30 to 14:00 at the Parking Lot B of the NM-AIST. They provided a soup with bread and the main menu was rice with vegetables, beef, chicken, and fish, and the dessert of cake and chocolateicecream. It was a wonderful lunch. We had every lunch there with many round tables. During lunch time, we discussed and chatted with various participants from different countries in Africa and the USA, and a few from Europe.

After the lunch break, there were seven parallel sessions from 14:00-15:45 such as A201 (Materials Health), Conference Hall (Sustainable Manufacturing and Construction), A202 (Water and Environmental Mitigation Technologies), B201 (Nanoscience / Nanotechnology), D201(Materials for Energy A), D202(Materials for Energy B-JUAMI), and B202 (Computational Materials Science). From 15:30-15:45, there was health break/poster session time. From 15:45 to 17:45 the parallel sessions continued. After 18:00, there was a poster session, but most of the participants left the conference place due to shuttle buses departing at the same time.

Most of the population in the African continent do not have access to clean drinking water. To understand the issue of clean water in Africa, I attended the session A202 of water and Environmental Mitigation Technology. I came to know that various harmful bacteria and heavy metals such as arsenic, mercury, lead, and cadmium are present in the groundwater in the African continental. Also, there is an extremely high content of Fluorine in the Arusha area ground water through volcanic soil. The local community poor peoples do not have enough money to buy plastic

bottled waters or clean tap water. Particularly, local African peoples are being suffered from teeth, body bones, and many other diseases due to contaminated drinking water. Most of the speakers presented technology on cheap and clean water supplying systems.

On December 11 (Wednesday) after a very simple breakfast, I took a shuttle bus from my hotel to the NM-AIST conference place because I was the first plenary speaker.

With Associate Professor Askwar Hilonga at the NM-AIST after his plenary talk.

My presentation title was "NiMoO4 for bacteria/drug degradation in water system," but my title was printed as "Using micro-structure design of Sialon ceramics for multi-functional properties". This title was copied from my CV. I prepared on the title of "Activity of the IUMRS," on the evening of December 10. I asked Eric Garfunkel at the NewJersey State University, USA to present a different title, who served as an organizer of the Africa-MRS since the Victoria Fall conference in 2011, where I had met him there. Eric said that there is no problem with changing the presentation title. I introduced the history of IUMRS and the activities of the IUMRS.

After my talk, Professor Paul Weiss at UCLA, USA delivered the second plenary talk on "Global Opportunity in Nanotechnology," which was related to a biosensor. Paul is serving as the editor of the Small. He joined the ICMAT in Singapore, 2 years ago. The third plenary speaker was Professor Kenneth Ozoemafrom the University of Witwatersrand in South Africa. He presented on "Manganese based Li-battery." The cover page of the 10th African MRS programis shown in Photo 6.

In the afternoon of December 11, there were seven parallel sessions. But, there was only one session on Materials for Energy, B-JUAMI, which was replaced as a session of Coach Workshop. The formation of the Joint US/Africa Materials Institute (JUAMI) was initiated at Princeton University in 2003. The JUANI was reactivated at the 7th Africa MRS conference in Addis Ababa, Ethiopia in 2013(organized by YohannesTeketel and Professor Eric Garfunkel).

There were two different coaching sessions of Part I: Selling your Science: The art of effective proposal writing from 14:00-15:30, from 15:45 to 16:30. Part 2: Publishing Research Results in High Impact Journals.This coach was delivered by Professor Geri Richmond at the University of Oregon, USA. She explained very well how to write both research proposals to Africa funding agencies and manuscripts to journals. Various questionswereraised among the participants.

From 16:30 to 18:30, a session for future works and the worker was held and moderated by Professor Wole-Soyejo at the Worcester Polytechnic Institute (WPI), USA. He invited three speakers. First speaker, Martin Burt from Fundacion Paraguaya and Worcester Polytechnic Institute spoke on the activity of African Scientists. The second speaker, Ange Nzihou at the IMT Mines Albi-Carmaux, France delivered a subject of Recycling wastematerials policy in Europe. The final speaker was Daran Apelian, Metal Processing Institute, Worcester Polytechnic Institute. Daran delivered a cyber-speech on the circular economics of Africa covering energy resources as well as mineral resources in Africa. Particularly, the current annual growth of the Africa economy is 5.4%. Even China's economic growth is 7%, but the growth ratein Europe is 0.7%.

From 18:30 to 21:00, there was a gala dinner with drinking beers. I had dinner with Benjamin and David at the University of Ghana.

It was a very exciting time with big African dancing. Most of the participants joined dancing, but not my dinner group. We left the conference place after dinner at 20:00. I asked Benjamin to have lunch with the leaders of the Af-

A lunch with leaders of the African MRS: David Dodoo-Arhin, Benjamin Agyei-Tuffour, SooWohn Lee, President Samuel Chigome (from left to right).

rica-MRS on December 12.

December 12 (Thursday) also had 3 plenary speakers; Federico Rosei at INRS-EMT, Montreal, Canada, Shelly Claridge at Purdue University, Indiana, USA, and one more.

I joined the water session in the morning and waited Benjamin Agyei-Tuffour at the Ghana University, Accra, Ghana. We made a reservation of a table in a lunch place. Dr. Samuel Chigome(elected president of Africa-MRS in 2020-2021), Khumo Butale (Editorial Assistant and Administrative Assistant of the Africa MRS), David Dodoo-Arhin at the Ghana University, Accra, Ghana (liaison office to the IUMRS, and an organizer and president of the 8th Africa MRS conference in 2015 in 2015, Accra, Ghana), and Benjamin Agyei-Tuffour at the Ghana University were gathered together and discussed with me.

The following items were discussed:

How the Africa-AMRS will prepare an annual report to the IUMRS every year.

How the Africa-AMRS will formulate vice president of A-MRS, secretary, and treasurer

How the Africa-AMRS will pay the membership dues to the IUMRS every year as the first step of level 1 (1,000US$) up to 2024, and move to level 3 (3,000 US$) after 2025.

How the delegation (particularly president) of Africa-AMRS will join the IUMRS General Assembly meeting every year in different continents.

How the Africa-MRS will host the IUMRS conference such as the IUMRS-ICAM 2025. The potential location of the IUMRS-ICAM2025 in Africa should be placed in a city where all airplanes from Europe, Asia, America,and Australia can be landed directly without transit.

Samuel Chigome said that he would provide the information of the 2017 Botswana meeting participants list of the 2019 Arusha, Tanzania meeting. I promised to send the presentation file of “Activity of IUMRS,” which delivered on Wednesday, December 11, as plenary talk of the 10th Africa-MRS conference in the NM-AIST, Arusha, Tanzania.

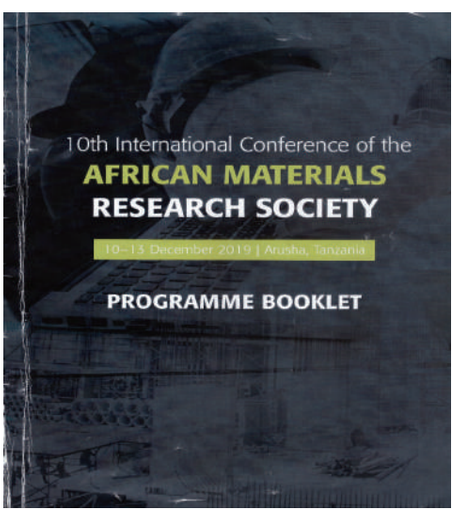


Photo 6. Cover page of the 10th Africa MRS Conference Program Book.

Chapter 4 Present Adhering Bodies

4.1 List of present IUMRS adhering bodies

African Materials Research Society

Australian Materials Research Society (A-MRS)

Brazil Materials Research Society (B-MRS)

Chinese Material Research Society (C-MRS)

European Materials Research Society (E-MRS)

Materials Research Society of India (MRS-I)

Materials Research Society of Indonesia (MRS-Ina)

Materials Research Society of Japan (MRS-J)

Materials Research Society of Korea (MRS-Korea)

Materials Research Society of Mexico (MRS-Mexico)

Materials Research Society of Russia (MRS-R)

Materials Research Society of Singapore (MRS-S)

Materials Research Society of Taiwan (MRS-T)

Materials Research Society of Thailand (MRS-Thailand)

4.2 African-MRS

4.2.1 List of A-MRS Leadership

Period	President	Vice President
2002-2003	Name: Prof AboubakerBeye Affiliation: Cheikh Anta Diop University, Senegal	
2003-2005	Name: Prof. Yunus Ballim Affiliation: University of the Witwatersrand, South Africa	
2005-2007	Name: Prof Josepha Tesha Affiliation: University of Dar-es-Salam, Tanzania	
2007-2009	Name: Prof Olusegun Adewoye Affiliation: Nigerian Agency of Science and Engineering Infrastructure, Nigeria	
2009- 2011	Name: Prof Mona Marei Affiliation: University of Alexandria, Egypt	
2011-2013	Name: Dr Joe Zimba Affiliation: Salene Technologies, South Africa	
2013-2017	Name: Prof Wole Soboyejo Affiliation: Worcester Polytechnic Institute/African University of Science and Technology, United States of America/Nigeria	
2017- 2019	Name: Prof. Hulda Swai Affiliation: Nelson Mandela African Institution of Science and Technology (NMAIST), Tanzania	Name: Dr Samuel Chigome Affiliation: Botswana Institute for Technology Research and Innovation (BITRI), Botswana
2019-	Name:Dr Samuel Chigome Affiliation: Botswana Institute for Technology Research and Innovation (BITRI), Botswana	

4.2.2 History of the African Materials Research Society

It has been almost nineteen years since the idea of the African Materials Research Society (AMRS) emerged in the year 2000 at the US/ Africa Materials Workshop that was held at the Farm Inn in Pretoria, South Africa. The Pretoria Workshop, which was partly inspired by President Bill Clinton's visit to Africa in 1998, was organized by Dr. Adrian DeGraef of the U.S. National Science Foundation (NSF) and Dr. Jill Sawyer of South Africa's National Research Foundation (NRF).

The Pretoria Workshop brought together 70 scientists, engineers and policymakers from Africa and the U.S. to discuss possible areas for collaborations in materials research and education. As a scribe at the workshop in Pretoria, it was my privilege to write down many of the ideas that were suggested for future Africa-Africa and US-Africa collaborations in materials research and education. These guided future activities to foster collaborations between U.S. and African scientists. They also stimulated the efforts to establish the African Materials Research Society (AMRS) within the framework of the International Union of Materials Research (IUMRS).

Following the Pretoria Workshop, Prof. Aboubaker Beye of the Cheikh Anta Diop University organized the first conference of the African Materials Research Society (AMRS) in 2002. The conference, which was held in Dakar, Senegal, brought together African Materials Scientists, such as Prof. Frank Nabaro of Wits University, South Africa, with African and U.S. scientists, engineers and policymakers that were interested in developing an enduring structure for the AMRS. The Dakar Workshop included some hotly contested sessions in which, a number of participants argued strongly for the inclusion of the African governments in the operations and decision-making processes of the AMRS. Ultimately, the majority of the participants voted for an AMRS that was independent of government, but a collaborator with government in appropriate areas.

Subsequently, Dr. Adriaan de Graaf (Mathematics and Physical Sciences Division of NSF) and Dr. Elbert Marsh (Engineering Division of NSF) sponsored a series of U.S./Africa Materials Workshops in San Diego and Puerto Rico. These were designed to bring together researchers from Africa, Latin America and the U.S. to develop thematic areas for future collaborations. They resulted in the identification of research opportunities in the areas of: thin films and heterogeneous materials, with applications to sustainable buildings, solar energy, water purification and biomaterials. They also resulted ultimately in the formation of the U.S./Africa Materials Institute (USAMI), the Americas Program, and a US/Egypt Program that were all initiated at Princeton University in 2003.

The above programs brought together teams of African, U.S. and Latin American researchers to explore the development of a triangular network of interactions between the US, Latin America and Africa. The network included the late Professor Olusegun Adewoye of Nigeria, the late Prof. Fawzy Hammad of Egypt, Prof. Frank Kavishe (a Tanzanian that was then based in Kenya), Dr. Joe Zimba of Zimbabwe and Prof. Holmer Savastano of Brazil. This first group initiated collaborative research in areas that were identified at earlier workshops. They also identified other researchers that were later invited to participate in the emerging collaborations. These collaborations resulted in the publication of more than 100 papers in peer-reviewed journals.

Many of those involved in the early workshops volunteered to organize the early conference of the AMRS. The first AMRS conference was organized by Prof. Aboubaker Beye Dakar, Senegal in 2002, while the second AMRS conference was organized by Prof. Yunus Ballim in Johannesburg, South Africa in 2003. This was followed by biennial AMRS conferences in Marakesh, Morocco, in 2005 (organized by Prof. Abdelazeez Jazouli); Dar-es- Salaam, Tanzania in 2007 (organized by Prof. Joe Tesha); Abuja, Nigeria (organized by the late Prof. Olusegun Adewoye); Victoria Falls, Zimbabwe in 2011 (organized by Dr. Francis Gudyanga, Dr. Joe Zimba and Prof. Eric Garfunkel), Addis Ababa, Ethiopia in 2013 (organized by Prof. Yohannes Teketel and Prof. Eric Garfunkel), Accra, Ghana in 2015 (organized by Dr. David Dodoo-Arhin and Prof. Eric Garfunkel), Gaborone, Botswana in 2017 (organized by Dr. Samuel Chigome and Prof. Eric Garfunkel) Tanzania 2019 (Organized by Prof Hulda Swai with the assistance of the AMRS Secretariat headed by Dr Samuel Chigome and the AMRS Board.

4.2.3 Establishment of a Permanent of the AMRS Secretariat/Headquarters in Botswana

In 2017, his Excellency the President of the Republic of Botswana, Dr. Eric Keabetswe Mokgweetsi Masisi officially opened the 9th International Conference of the African Materials Research Society that was held in Gaborone, Botswana 9-14th December 2017. This showed the commitment of the government of Botswana to Materials Research, which serves as an example for other African countries. The commitment of the government of Botswana to Materials Research is also demonstrated by the establishment of the Botswana Institute for Technology Research and Innovation (BITRI) Centre for Materials Science http://www.bitri. co.bw/cms/. Therefore, it did not come as a surprise that with such support from the government, AMRS2017 was a very successful conference. Consequently, the AMRS Board appointed Botswana as the home of the AMRS secretariat hosted at BITRI www.bitri.co.bw. It is also in that year that Dr Samuel Chigome was appointed to set-up the secretariat office which also leads to him being appointed as the first Vice President of AMRS. In order for the Secretariat office to function, Dr Samuel Chigome appointment the first AMRS Administrative Officer, Miss Khumo Butale. Together, they have worked tirelessly to set-up the first AMRS website https://africanmrs.net/ as well as to publish the first AMRS newsletter https://africanmrs.net/wp-content/uploads/2019/09/AMRS_Newsletter Issue1-2019-1.pdf among other things. At the end of AMRS2019, Dr Samuel Chigome elevated to the position of President of AMRS so that he could drive the society to greater heights.

The main objectives of the secretariat are to carry out administrative tasks aimed at achieving the following objectives:

1. To ensure the involvement and coordinated participation of all 54 African countries in the activities of AMRS.
2. To establish a sustainable source of funds for activities of AMRS.

In order to function effectively and cover the whole of Africa, through the newly established secretariat office in Botswana, regional representatives who represent the five regions of Africa were appointed to work closely with the head of secretariat and the AMRS Administrative Officer.

Name	Country	African Region
Mr.Tatenda Crispen Madzokere	Zimbabwe	Southern Africa
Dr. Josepha Tenda Foba	Cameroon	Central Africa
Prof. Said Kenai	Algeria	Northern Africa
Dr. Benjamin Agyei-Tuffour	Ghana	West Africa
Dr. Dickson Andala	Kenya	East Africa

4.2.4 The overall objectives of AMRS are:

1. To promote excellence in all aspects of materials research in Africa.
2. To ensure that materials research contributes significantly to the various national strategies for social equity and poverty alleviation in a constructive and sustainable manner.
3. To work closely with governments and state structures to develop appropriate policy and support for materials research and development.
4. To build a network of materials researchers which encourages multi-national and multi-disciplinary collaboration in materials research – both within Africa and between African researchers and the rest of the world.
5. To identify and foster specific areas of materials research as appropriate in the different countries or regions in Africa.
6. To promote information and resource sharing, exchange and development in materials science.
7. To regularly host conferences, symposia and conferences with a view to promoting dialogue between materials researchers within Africa as well as with researchers outside the continent.

8. To encourage downstream materials manufacturing and value-adding activities in all countries in Africa.
9. To strengthen the facilities and other resources for materials research in higher education sectors

4.2.5 Brief Introduction of AMRS Past Biennial Conferences

1st Conference

Date: December0-17th, 2002
Organizing institution: University of Cheikh Anta Diop
Venue: Ngor Diaama Hotel, Dakar, Senegal
Chair: Prof. Aboubaker Beye
Scale:120

2nd Conference

Date: December 8-11th, 2003
Organizing institution: University of the Witwatersrand
Venue: University of the Witwatersrand, Johannesburg, South Africa
Chair: Prof. Yunus Ballim, Vice chair: Prof. Arthur Avery, Secretary: Dr. Herbert Uzoegbo
Theme: Building partnerships for excellence in materials research in Africa
Scale: 184

3rd Conference

Date: December7-15th, 2005
Organizing institution: University of Hassan II Mohammedi
Venue: Hotel Sangho, Marrakesh, Morocco
Chair: Prof. Abdelaziz El Jazouli
Scale: 300

4th Conference

Date: December10-14th, 2007
Organizing institution: University of Dar es Salaam
Venue: University of Dar es Salaam, Dar es Salaam, Tanzania
Chair: Prof. J.V Tesha; Secretary: J. Buchweshaija
Theme: Cementing in Materials Research in Africa

5th Conference

Date: December14-18th, 2009
Venue: Abuja Sheraton Hotel Towers, Maitama, Abuja, Nigeria
Chair: Prof. O.O. Adewoye,; Vice Chair: Dr. A.Y. Fasasi,
Secretary: Dr. B.B. Babatope
Theme: Nanotechnology, Advanced Materials and Manufacturing Technology for Africa

6th Conference

Date: December11-16th, 2011
Organizing institution: Ministry of Science and Technology Development (Zimbabwe)
Venue: Elephant Hills Hotel, Victoria Falls
Chair: Dr. Joseph Zimba, Secretary: Prof. Francis Gudyanga
Scale: 300

7th Conference

Date: December8-13th, 2013

Organizing institution: University of Addis Ababa

Venue: African Union Conference Center, Addis Ababa, Ethiopia

Chair: Prof. Teketel Yohannes

Theme: Challenges and future priorities for the field, with a focus on how materials research can aid African development

Scale: 250

8th Conference

Date: December 6-11, 2015

Organizing institution: University of Ghana

Venue: Mensvic Grande Hotel, Accra, Ghana

Chair: Prof. Boateng Onwona-Agyeman,

Vice chair: David Dodoo-Arhin,

Secretary: Dr. Benjamin Agyei-Tuffour

Theme: Transforming African economies through innovative materials development

Scale: 350

9th Conference

Date: December11-14th, 2017

Organizing institution: Botswana Institute for Technology Research and Innovation

Venue: Gaborone International Conference Centre, Gaborone, Botswana

Chair: Prof. Nelson Torto;

Vice chair: Prof. Asare Nkansah

Secretary: Dr. Samuel Chigome

Theme: Addressing Africa's challenges through materials development

Scale: 535

10th Conference

Date: December10-13th, 2019

Venue: NMAIST, Arusha, Tanzania

Chair: Prof. Hulda Swai

Vice chair: Prof. Verdiana Masanja

Secretary: Dr. Francis Moyo

Theme: African materials for African development

Scale: 336

4.3 Australian-MRS

4.3.1 History and background

Professor Jim Williams

The Australian Materials Research Society(A-MRS) was a founding adhering body of IUMRS in 1991. However, A-MRS began as an entity some 4 years earlier after a past President of MRS, Woody White, requested that the Australian materials community consider establishing such a society. Extensive discussions with existing materials-related professional societies in Australia indicated that they would not support a new society and would actively lobby their members not to join A-MRS. Thus, it was decided that the A-MRS entity should not be a separate society in Australia but an umbrella organization that coordinated materials activities across around 10 national materials-related societies. This meant that A-MRS did not have a membership in its own right but was linked to members of these existing societies, around 2000 scientists with materials science or engineering expertise. Although this situation was not ideal, it did allow A-MRS to establish itself in the Australian research environment, for example by taking leadership in sponsoring interdisciplinary materials conferences and workshops between two or more of the national materials societies, as well as providing a conduit between the local materials-related societies and IUMRS. A-MRS also played a leading role in fostering networking across Australia, between materials scientists and students, as well as industry. It lobbied the Australian government to provide seed funding to establish materials networks, and this resulted in national networks in both research (advanced materials and nanotechnology) and industry (linking industry with the research community) that all received direct government seed funding until around 2010. In 2013 the Australian Academy of Science reviewed its National Committees of Science and established a new committee, the National Committee of Materials Science and Engineering (NCMSE). The Academy consulted with A-MRS as to the best way to establish this committee and link with both the Australian materials community and IUMRS. It was decided that the NCMSE committee and the A-MRS executive committee should, wherever possible, have a common membership and the Chair of NCMSE should be the President of A-MRS. Both the NCMSE and A-MRS committees have a New Zealand representative to link with the New Zealand materials community. These arrangements have worked extremely well since that time and have resulted in A-MRS becoming a more professional entity with a revamped set of Statutes and Bylaws. A-MRS now has a strong voice in the Australian Academy of Science and hence a more direct line of communication with the government. A-MRS remains the conduit to IUMRS but the Academy pays the membership dues to IUMRS, as it does for all International Unions. Recently a decision was made by both the NCMSE and A-MRS to establish a register of all materials scientists and engineers in Australia, which could be considered as a de facto list of A-MRS members. The following sections provide some highlights within A-MRS over the past 30 years.

4.3.2 Research and industry networks initiated by A-MRS

The ARNAM young researcher workshop delegates in 2010

In 1998, A-MRS assembled an Australian delegation to attend an IUMRS workshop on networking between research, industry and government agencies. It was held at Turtle Bay, Hawaii. The Australian delegation included two policy officers from the Australian Federal government Department of Science and Industry. These officers were so impressed by the workshop networking events and outcomes that they worked with A-MRS to seek government funding for a research-industry network across Australia. This proposal was successful and a 'Future Materials

ICONN 2006 conference delegates.

Network' was established in 2002. It has provided an important link between a number of industry associations in Australia and the materials research community. A-MRS was a proactive sponsor of this network, which ran a number of interdisciplinary industry-research events and workshops. These led to improved collaboration and interaction between industry and research communities. The Future Materials Network operated for 12 years and wound up in 2014 when enduring linkages between research and industry had been established.

In 2003, the Australian Research Council, responding to a proposal from A-MRS leaders and other local societies, established a research network program and called for applications from the research community. A-MRS initiated two proposals: 'The Australian Research Network for Advanced Materials' (ARNAM) and 'The Australian Research Council Nanoscience and Nanotechnology Network' (ANN). The focus of both proposals was to: provide networking opportunities for materials researchers across the country and to enhance career and other opportunities for materials students and early career researchers across Australia. In late 2004, both network proposals were funded by the Federal Government, the convener of ARNAM Jim Williams and convener ANN, C. Jagadish, both leaders of A-MRS.

These networks have been a vital component of A-MRS operation since this time. Both networks established a database of profiles of materials researchers and institutions across the country in advanced materials (ARNAM) and nanotechnology (ANN), as well as a comprehensive compendium of materials research facilities. These databases have provided an essential resource for enhancing research collaboration across the country, particularly involving young researchers and students. Both networks have run a number of workshops and conferences, such as the biennial ARNAM young researcher workshops that involved grant writing mentorship and interactions with key industries, as well as the biennial conference founded by Jagadish, the International Conference on Nanoscience and Nanotechnology (ICONN) run by ANN.

These network activities have provided substantial career opportunities for young researchers. ARNAM and ANN have also funded students and young researchers to visit national and international laboratories, as well as conferences, including 3 IUMRS conferences, as indicated below. Government funding for the networks ended in 2012 but ANN has managed to secure institutional funding to continue operation of this network until the present time.

4.3.3 International workshops sponsored by A-MRS

US-Australia Nanotechnology workshop in 2006.

Several international workshops have been held over the past 20 years. Key examples are the following: an Australian-US workshop on Nanotechnology was held in Melbourne in early 2006 and focused on opportunities for collaboration, industry involvement, including risks of the technology. It led to collaborative opportunities for researchers in both countries and bilateral funding opportunities also resulted. A follow up workshop was held in Washington in 2009.

An Australian-India workshop on ad-

Australia-India workshop 2008

EU-Australia workshop in Nanotechnology 2010

vanced materials and nanoscience was held in Canberra in 2008 to promote research in both countries, as well as opportunities for bilateral collaboration supported by funding initiatives of both countries. A follow up meeting was held in Delhi in 2012. This initiative led to the Federal government funding of a bilateral research and collaboration scheme between India and Australia.

An EU-Australian workshop on nanotechnology was held in Sydney in 2010 to showcase research across Europe and Australia and explore collaborative opportunities. This resulted in a follow up meeting in Brussels, where research collaboration between the EU Framework programs and Australian research was a theme. This initiative directly resulted in Australian researchers being admitted to several EU Framework projects over a 5-year period.

4.3.4 IUMRS sponsored conferences run by A-MRS

IUMRS-ICEM 2008 was held in Sydney (under the Chairmanship of Jim Williams) and attracted around 1000 delegates who participated in 19 topical symposia, two Forums on Energy and Industry, and 3 events for international students run jointly with ARNAM and ANN. The five plenary speakers included one Nobel Laureate, Harry Kroto, and Millie Dresselhaus from MIT. Both of these speakers contributed very actively in the student activities at the conference. The Energy Forum was organized jointly by A-MRS and MRS and had a focus on climate change and renewable energy solutions. The Industry Forum focused on new industries involving advanced materials and included speakers from General Motors, One Solar, and major start up companies from Europe and Asia.

Poster sessions at IUMRS-ICA 2019

IUMRS-ICYRAM 2018 (chair: Drew Evans) was held in Adelaide and attracted close to 200 participants, almost entirely young researchers from Australia and more than 25 countries. The IUMRS Young Researcher award was presented at the conference by BVR Chowdari, MRS Singapore President, to Andrea Alù (City University of New York).

IUMRS-ICA 2019 (Co-chairs: Julian Gale and Lan Fu) was held in Perth and attracted around 500 participants from 29 countries, including over 130 students and young researchers. There were 7 materials themes and 38 subthemes (or symposia). Over 30 of the student and young researcher attendees were financially supported by the Australian Academy of Science, ANN, an industry sponsor and MRS Singapore. About half of the young participants supported to attend were from outside of Australia.

4.3.5 Initiatives of A-MRS over the past 5 years

In 2013, the Australian Academy of Science decided to establish a National Committee for Materials Science and Engineering (NCMSE), one of 22 National Committees of the Academy. Since many of the aims of this committee overlapped with the goals of A-MRS, such as connecting with the materials community across the country, liaising with international science unions, mounting events for young scientists and supporting the materials community in proposals to government, it was decided that all executive members of A-MRS would be members of the NCMSE. This arrangement has worked very well and A-MRS has coordinated the timing of changes to its executive offers with new members of NCMSE, including a common A-MRS President and Chair of the committee. At the present time Jo Etheridge occupies these positions. Both entities have worked together on several initiatives including support for attendees at IUMRS and A-MRS conferences and strategic plans submitted to government. Indeed, an early success was the production of a Nanotechnology strategic plan in 2013, with input from the entire materials community andpresented to the Federal government, that led to continuing and new infrastructure funding for nanotechnology, including the Australian Nanofabrication Facility (ANFF) which is distributed across the country and is an important resource for materials researchers.

In terms of young researchers, the Academy of Science has a very active Early and Mid-Career Researcher Forum with over 2000 members, and a few hundred of these are materials researchers. The NCMSE and A-MRS have effectively engaged with this group. For example, in 2016 young researchers organized a national workshop on 'Advanced Materials for the 21st Century' that was an outstanding success and resulted in many new collaborations amongst young materials researchers across the country. EMRS was so impressed with this workshop that they organized a young researcher workshop based on its format at the 2017 World Materials Summit meeting in Strasbourg, France.

Over the past 10 or more years, A-MRS has been active in organising joint activities and symposia at IUMRS meetings with other IUMRS Adhering Bodies, most notably with MRS, MRS Japan, MRS Singapore and MRS India.

A current initiative of both the Academy's NCMSE and A-MRS is to compile a register of all materials researchers in the country that will become a de facto membership list for A-MRS, rather than the current situation of connecting with the community through other professional materials societies in the country. It is envisaged that this will lead to a step function increase in the participation of materials researchers with A-MRS and an increase it its activities and influence with government. A particular focus is on support and career development for young researchers in terms of suitable events including interaction with key industry people. We believe that some of these initiatives could be suitably translated to other MRS societies and regions.

Finally, A-MRS congratulates IUMRS on its first 30 years and looks forward to a productive future and a continuing strong interaction with IUMRS.

By Jim Williams, Inaugural Past President of A-MRS, *February 2020.*

4.4 Brazil-MRS

Genesis and Short History of the Brazilian Materials Research Society (B-MRS)

(Sociedade Brasileira de Pesquisaem Materiais (SBPMat)

4.4.1 From Prof. Osvaldo N. Oliveira Jr, President of B-MRS (2016-2019), University of Sao Paulo, Sao Carlos Institute of Physics, Brazil

Prof. Osvaldo N. Oliveira Jr

The Brazilian Materials Research Society (B-MRS) was created on June 26, 2001, in the "General Assembly of Constitution", culminating a process of three years, which was conducted by Prof. Guillermo Solórzano (PUC-Rio) and a group of physicists, engineers, and chemists of several Brazilian institutions. The idea of establishing a Brazilian society for materials research had been discussed over the years, particularly in conferences related to materials science and engineering. Furthermore, the Brazilian community in the field of materials was growing fast, thus denoting the need for researchers to organize themselves into an inter-disciplinary scientific society.

The workshop "Frontiers in Materials Research, Technology and Education: a Workshop to Advance Pan-American Collaboration", held in Rio de Janeiro in 1998 was emblematic in the history of the Brazilian materials community. This event was hosted by the Brazilian Council for Scientific Development (CNPq) and co-sponsored by the National Science Foundation (NSF) from the USA. The workshop itself was successful in reaching its objectives, but it became evident that the Brazilian materials community could no longer continue without a representative national scientific society.

Motivated to overcome this deficiency and contribute towards founding such a society, the co-chairs of the Pan-American Symposium, Guillermo Solórzano and Edgar Zanotto, decided to coordinate activities leading to creation of the "Sociedade Brasileira de Pesquisaem Materiais (SBPMat)". They received support from CNPq and from the international community, namely IUMRS and MRS.

4.4.2 From Prof. Guillermo Solorzano, founding president of B-MRS (2001-2003)

Prof. Guillermo Solorzano

In April, 1999, a mailing list of materials researchers provided by CNPq was used to issue a nation-wide invitation letter for researchers to participate in the making of a Brazilian Materials Research society. The letter described the format of this new society, genuinely interdisciplinary and extending the frontiers in materials research. It should represent the community in this country of continental size, and would count on the support from the Brazilian funding agency CNPq and from the international community. The response to this letter was overwhelmingly positive, judging from the numerous enthusiastic messages of support. In May, 1999, Prof. Solorzano and Prof. Zanotto were invited to extend this invitation at the "Encontro Nacional de Matéria Condensada" gathering around 1000 solid state physicists from Brazil. Their receptivity was equally positive. At the end of May a second circular informing about the rapid and positive evolution was released and by the following month a third message to a much wider mailing list was sent. In this third circular the main objectives of the new SBPMat were put forward, also including an electronic registration file to capture the scientific profile of individual members.

Several hundreds of pre-affiliations e-mails proposing interesting ideas were received. In order to incorporate and summarize innumerous suggestions, two main courses of action were adopted:

a. National meetings in different parts of the country, to promote and discuss further the nature and mission of SBPMat,
b. Constitution of an "Interdisciplinary Materials Committee" comprising high-level materials scientists in the Brazilian community willing to undertake this endeavor of establishing a National Materials Society.

The outcome of these meetings was highly positive, an indication of the enthusiasm of the community. The "In-

terdisciplinary Materials Committee" was established by leading scientists, representing diverse regions of the country and different materials research fields, composed of engineers, physicists and chemists, as follows:

- Aldo Craievich (USP)
- Aloísio Klein (UFSC)
- Angelo Padilha (USP)
- Edgar Zanotto (UFSCar)
- Elisa Baggio Saitovitch (CBPF)
- Elson Longo (UFSCar)
- Evando Mirra de Paula e Silva (CNPq)
- Fernanda Coutinho (IMA)
- Fernando Galembeck (UNICAMP)
- Fernando Lázaro (PUC-Rio)
- Guillermo Solórzano (PUC-Rio)
- José A. Eiras (UFSCar)
- José Arana Varela (UNESP)
- Luis Henrique de Almeida (UFRJ)
- Moni Behar (UFRGS)
- Renato Jardim (USP)
- Roberto Villas Bôas (CETEM)
- Sergio M. Rezende (UFPE)
- Wander Vasconcelos (UFMG)

During the following months of 2000 there were intense discussions on the structure of the bylaws, and in April 2001 SBPMat was founded in an assembly meeting in PUC- Rio de Janeiro, which allowed all members to vote online. The founding members reached 370 in number. In September 2002, the inaugural meeting of SBPMat took place in Rio de Janeiro, chaired by Guillermo Solórzano, with 6 symposia and about 400 participants. It is worth mentioning that the president and general secretary of IUMRS as well as the presidents of MRS and E-MRS attended this inaugural event. The following annual meetings increased in the number of symposia and participants. In 2009, the VIII SBPMat Meeting was held jointly with ICAM, with 28 symposia and 1800 participants from 48 countries. Since then, the B-MRS meetings have gathered 1.200 – 2.100 participants.

The following were the venues and corresponding annual meeting chairs:

- September 2003: in Rio de Janeiro, chaired by Guillermo Solórzano,
- September 2004, In Foz de Iguacu, chaired by Elson Longo
- September 2005, in Recife, chaired by Celso Melo
- September 2006, in Florianopolis, chaired by Aloisio Klein
- September 2007, in Natal, chaired by Dulce Melo
- September 2008, in Guaruja, chaired by Aldo Craievich and ReginaldoMuccillo
- September 2009, together with ICAM 2009, in Rio de Janeiro, chaired by Guillermo Solórzano and Elisa Saitovitch.
- October 2010, in OuroPreto, chaired by Margareth de Andrade
- September 2011, in Gramado, chaired by Paulo Fitchner.
- September 2012, in Florianópolis, chaired by AloisioNelmo Klein and André AvelinoPasa.
- September - October 2013, in Campos do Jordão, chaired by José Alberto Giacometti and Julio Ricardo Sambrano.
- September - October 2014, in João Pessoa, chaired by Ieda Maria Garcia dos Santos.
- September - October 2015, in Rio de Janeiro, chaired by Marco Cremona and Fernando Lázaro Freire Junior.
- September 2016, in Campinas, chaired by Mônica Cotta and Ana Flávia Nogueira.

- September 2017, in Gramado, chaired by Daniel Weibel.
- September 2018, in Natal, chaired by Antonio Eduardo Martinelli.
- September 2019, in BalneárioCamboriú, chaired by Ivan Helmuth Bechtold and Hugo Gallardo.
- August – September 2020, jointly with IUMRS ICEM, in Iguassu Falls, chaired by Gustavo Dalpian.

During the 18years of existence SBPMat executive committees had the following presidents:

- Guillermo Solórzano, founding president, 2001-2003
- Elson Longo, 2003-2005
- Fernando Lázaro, 2006-2009
- Jose Arana Varela, 2010-2011
- Roberto Mendonça Faria, 2012-2015
- Osvaldo N. Oliveira Jr, 2016 - 2019

Currently SBPMat membership reaches about 4.500 investigators and students from universities, research centers and industry.

In addition to the organization of the annual meeting and other international events, SBPMat has carried out other actions for the materials community and for the society in general. In 2012, the society launched the B-MRS newsletter, a monthly electronic bulletin dedicated to the dissemination and popularization of Materials Science and Technology, focusing on the work and people from Brazil. An English version was launched in 2014. The newsletter has more than 3.500 real readers. SBPMat also maintains accounts on Facebook, Twitter, Linkedin, Slideshare and Instagram, having several thousands of followers. In 2014, the society created the SBPMat University Chapters program, which promotes regional nodes of the society, located in universities and conducted by teams of students. Nowadays, the program features 12 university chapters, covering all regions of the Brazilian territory. In the same year, the society prepared, in partnership with the Institute of Physics (IoP), the document Science Impact, an overview on the materials research in Brazil, in English, available in digital and printed version.

4.5 Chinese-MRS

30 Years of Chinese Materials Research Society with IUMRS

By Prof. Yafang Han

Prof. Yafang Han

It is my great pleasure to write this article for celebrating the 30th anniversary of IUMRS. By chance IUMRS and C-MRS have the same birthday year of 1991. I experienced the establishment of both organizations fortunately and have worked for C-MRS for more than 30 years as deputy general secretary (1991-1999), vice president (1999-2007) and general secretary (2007- present).

4.5.1 Introduction to Chinese Materials Research Society

C-MRS is one of the 8 founding members of IUMRS. In the late1980s some Chinese materials scientists, Prof. Dongsheng Yan, Prof. Changxu Shi and Prof. Hengde Li, et al, joined the activities of other MRSs, such as MRS-USA, MRS-Japan, E-MRS, and therefore very good relationship between Chinese materials scientists and the scientists from other countries or areas had been established. Since C-MRS was formally established on May 16, 1991, C-MRS joined IUMRS nominally as Chinese Committee of IUMRS(CC-IUMRS) in 1989.

4.5.2 Headquarters office

The headquarters office of C-MRS from 1991 to 2002 was at the address of 7 Baishiqiao Road, Haidian District,

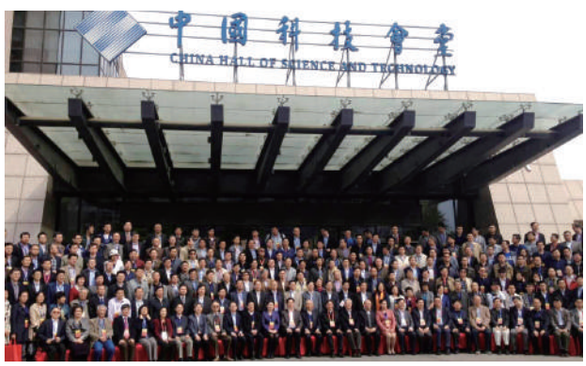
Beijing (Provided free by Beijing Institute of Technology). There were only two part-time staffs at the beginning. In 2001 C-MRS bought two suites as office and the head office moved to the present address: Rm4101-4102, No. 62 Zizhuyuan Rd, Haidian District, Beijing in 2002. Now C-MRS head office has 12 full-time staffs and 4 part-time staffs, with the office area of 400 square meters.

4.5.3 History of C-MRS

First C-MRS member representative assembly in Beijing, May 16, 1991. Prof. Hengde Li was elected as the first president, and served from 1991 to 1999

Chinese Materials Research Society (C-MRS) was established in May, 1991. The first member representative assembly was held at the campus of Beijing University of Technology, May 16th , 1991. In 1980s 46 world famous Chinese materials scientists from 27 Chinese academic societies, including Prof. Dongshen Yan, Prof. Changxu Shi, Prof. Hengde Li, Prof. Lanying Lin, Prof. Mingao Yan, Prof. T. Kou, et al, initiated to organize C-MRS, and they sent an application to Chinese Association of Science and Technology (CAST) in April 1990, and the application was approved in 1991. C-MRS became a legal member of CAST in 1991 and the full member of CAST in the year of 2000. The first term(1991-1995) of the board of Governors had 118 members with 28 standing committee members.

Group photo of C-MRS members representative assembly, Nov. 13, 1999, Beijing.



Group photo of C-MRS members representative assembly, April 18, 2016, Beijing

4.5.4 Presidents

The founding and first president of C-MRS was Prof. Hengde Li from Tsinghua University. Prof. Hengde Li served as the president from May 1991 to Nov. 1999. He made great contribution to C-MRS. During his term C-MRS faced big difficulty in financial situation since there was no support from government and companies, the only income was very limited membership fee. Under the 8 years' leadership of Prof. Li, great progress had been achieved: (1) He successfully organized many domestic and international conferences; (2) C-MRS made a profit of buying 2 suites for office use, and (3) C-MRS made outstanding contribution to IUMRS: Prof. Li was elected as the first vice president and president (1997-2000) of IUMRS, and he initiated IUMRS series conference, ICA, which started from 1993. The dedication of Prof. Li and other older generation scientists encouraged young scientists to work hard for the society voluntarily.

The second president was Prof. Lian Zhou, director of Northwest Institute of Nonferrous Metals, who served from Dec.1999 to Sept., 2007. During his presidency term, IUMRS joined ICSU and became the full member of ICSU, and he initiated IUMRS series meeting. The World Materials Summit started from 2007. The third president was Prof. Boyun Huang, the president of Central South University. Prof. Boyun Huang served as president from Sept. 2007 to April 2016. During his term, Prof. Huang paid more attention to the academic exchange, and suggested that Chinese material conferences should be held once a year in difference cities, instead of Beijing only, which received very good results for the conference. Prof. Huang also paid close attention to the publication, supporting the journal Progress in Natural Science: Materials International (PNS:MI), finished the new edition of "Chinese Materials Dictionary", 16series of books on "Advanced Materials", and "Macropaedia -Materials Volume", et al. The fourth president was Prof. Yuanyuan Li, the president of Jilin University, who served from April 2016 to June 2018. And the fifth president is Prof. Bingbo Wei, vice president of Northwest Polytechnical University, who has served since July 2018.


Prof. Hende Li


Prof. Lian Zhou


Prof. Boyun Huang


Prof. Yuanyuan Li


Prof. Bingbo Wei

4.5.5 Board of Governors

The 7th member representative assembly was held in Beijing, April 18th, 2016. The board of Governors of C-MRS (7th term from 2016) now has 260 members with 83 standing committee members. These members are the material research scientists and administrators from the materials research institutions and related universities, and entrepreneurs from materials companies.

4.5.6 Membership

C-MRS has more than 200 group members, including well-known universities, materials faculties, research institutions, and commercial enterprises (with more than 30,000 professors, research scientists, students and entrepreneurs). There are about 8000 individual members at present.

4.5.7 Branches

C-MRS has 23 academic branches, covering the fields of energy materials, environment materials, electronic materials, functional materials, structure materials, and materials processing and design, and so on. The regional materials research societies have been established in many provinces and cities, such asSichuan, Chongqing, Zhejiang, Tianjin, Guangdong, Shanxi, Ningxia, Ningbo, and so on. They are all very active for academic communication and consultation for governments and materials enterprises.

4.5.8 Academic Exchange

1. C-MRS Annual Academic Meeting (Chinese Materials Congress/Conference)

The materials research conference in China was initiated by the old generation materials scientists (Prof. Dongshen Yan, Prof. Changxu Shi and Prof. Hengde Li, et al) in 1986, before the founding of C-MRS. The first materials research Conference was held in Chongqing in Oct. 1986, with 600 participants. Later on, the conferences were held every two year till 2006. After 2008 the conference has been held every year. The"C-MRS Excellent Poster Award"

is also set up for the authors who present excellent poster papers. In general 10-20 of each award are given every year depending the total number, and the annual meeting is combined with the exhibition on "Advanced Materials, Manufacturing and Testing Equipment".

The number of symposia and the scale of the conference increases year by year, as shown in the following table.

C-MRS Annual Conferences (from 2008 to 2019)

Notes 2013*: Combined with 13th IUMRS -ICAM

2016#: Combined with 17th IUMRS -ICA

Year	Time	Place(City)	Symposia	Participants	Abstracts	Registration fee paid
2008	Nov.22-24	Guangzhou	19	1100	1100	900
2009	Oct.14-17	Suzhou	13	800	810	598
2010	June18-22	Changsha	17	1200	1238	1000
2011	May18-22	Beijing	24	1500	1456	1334
2012	July12-16	Taiyuan	23	1800	1821	1650
2013*	Sept.23-27	Qingdao	33	2500	2410	1910
2014	July 4-8	Chengdu	19	2300	1858	1791
2015	July10-14	Guiyang	30	3200	2700	2829
2016#	Oct.20-24	Qingdao	28	2500	2308	2035
2017	July6-12	Yinchuan	37	5500	4000	4590
2018	July12-16	Xiamen	35	6000	4969	4290
2019	July10-14	Chengdu	46	7000	4320	5707

Opening Ceremony of C-MRS Chinese
Materials Conference in Guiyang, Guizhou, July 11, 2015

Opening Ceremony of C-MRS Chinese Materials Conference in Yinchuan, Ningxia, July 7, 2017

Opening Ceremony of C-MRS Chinese Materials Conference in Xiamen, Fujian, July 13, 2018

Prof. Soo wohn Lee, President of IUMRS gave a speech at MRS Chinese Materials Conference in Xiamen, Fujian, July 13, 2018

2. International Conferences

C-MRS has successfully organized many IUMRS series conferences, including ICA1993, ICA2000, ICA2010, ICA2016, ICAM1999, ICAM2013, ICEM2002, ICYRAM2014, WMS2009, WMS2016, WMS2019. IUMRS-ICAM 1999 was held in the Beijing International Convention Center, June 13-18,1999. 36 parallel symposia and two forums were held during the conference, and the size of the conference was about 1800 including more than 700 international participants from 45 countries and areas. In 2002 IUMRS-ICEM 2002 was held in the world famous historic city Xi'an, June 14-18, 2002.IUMRS-ICEM2002 included 16 parallel symposia, and the attendance of the conference was about 800 including more than 300 international participants from 28 countries. The list of IUMRS Series Meetings organized by C-MRS in China is as follows.

IUMRS Series Meetings organized by C-MRS in China

Year	Time	Place	Meeting's Name	Number of Symposia	Scale	Country/areas of Participants From
1993	Sept. 18-20	Yangtze River	IUMRS-ICA		180	
1999	June 14-18	Beijing	IUMRS-ICAM	36	2000	45
2000	July 24-26	Hongkong	IUMRS-ICA	12	700	18
2002	June 14-18	Xi'an	IUMRS-ICEM	14	800	28
2009	Oct. 10-13	Suzhou,	IUMRS-WMS	6 parallel sessions	130	20
2010	Sep. 25-28	Qingdao,	IUMRS-ICA	17	1800	12
2013	Sept. 22-28	Qingdao,	IUMRS-ICAM	33	2500	34
2014	Oct. 24-27	Haikou	IUMRS-ICYRAM	15	1400	32
2016	Oct. 17-18	Rizhao	IUMRS-WMS	4 parallel sessions	100	16
2016	Oct. 20-24	Qingdao	IUMRS-ICA	28	2500	17
2019	Oct. 24-26	Hangzhou	IUMRS-WMS & Celebration of IUMRS 30 years	2 parallel sessions	80	18

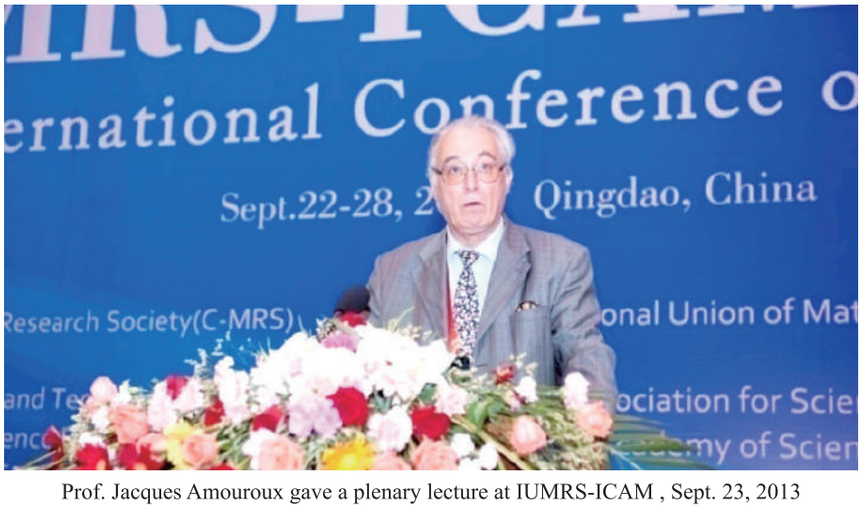
IUMRS GA meeting during IUMRS-ICAM 1999 in Beijing

IUMRS GA meeting during IUMRS-ICEM 2002 in Xi'an, China

Opening Ceremony and Plenary Lectures of IUMRS-ICAM, Sept. 23, 2013

IUMRS President Prof. Osamu Takai gave a speech at the opening ceremony of IUMRS-ICAM , Sept. 23, 2013

C-MRS vice president Prof. Bingbo Wei gave souvenir and certificate to plenary speaker Prof. QikunXue at IUMRS-ICAM , Sept. 23, 2013



Prof. Jacques Amouroux gave a plenary lecture at IUMRS-ICAM , Sept. 23, 2013

IUMRS GA meeting during IUMRS -ICAM in Qingdao, Oct. 2013

Opening Ceremony and Plenary Lectures of IUMRS-ICA, Oct.21, 2016

IUMRS President, Prof. Hanns-Ulrich Habermeier made a speech at the Opening Ceremony of 17th IUMRS-ICA, Oct.21, 2016

Opening Ceremony of Second IUMRS-ICYRAM, in Haikou, Oct. 25, 2014

Prof. Osamu Takai (IUMRS President,) and Prof. B.V.R. Chowdari (President of MRS-Singapore) gave the "Young Scientist Award " to Dr. Ali Khademhosseini, at Second IUMRS-ICYRAM, in Haikou, Oct. 25, 2014

Awarding Ceremony of Excellent Posters at the Second IUMRS-ICYRAM, in Haikou, Oct. 26, 2014

3. Bilateral and Trilateral Conferences with IUMRS Adhering Bodies

C-MRS has a very good relationship with the other IUMRS adhering bodies and has organized many bilateral academic conferences with E-MRS, MRS-Japan, MRS-Korea, MRS-Russia, MRS, MRS-T and MRS-Singapore, as well as Trilateral Conferences, such as, China-Japan-Korea and China-Singapore-India conferences during the last 30 years.

4.5.9 Serving and Consulting

1. Awards for C-MRS members

C-MRS Lifetime Achievement Award The award gives the old generation scientists who both have made outstanding achievement in his/her academic career and made great contribution to the Society.

C-***MRS Contribution Award*** The award encourages the scientists who both have made excellent achievement in his/her academic career and made special contribution to the Society. Most of the winners have been served as C-MRS standing committee members.

C-MRS Science and Technology Progress Award C-MRS established an award for the members who have made outstanding achievements in research, development and application in the field of materials science and technology. The award is named as "C-MRS Science and Technology Progress Award" and was authorized by the Ministry of Science and Technology of China in 2006. 3-5 awards each year have been given since 2007.

2. Consulting service

Consulting for Chinese governments During the last 30 years C-MRS has provided the Consulting service for the government policy makers for formulating materials research and development plan and rules of short term or long term. The C-MRS members have raised many good suggestions to "*Ministry of Science and Technology"*, "*National Development and Reform Commission of China" and " Ministry of Industry and Information Technology of China"*, and quite a few suggestions have been adopted by the government.

Consulting for materials enterprises and industrial parks C-MRS also provide the platform for the materials scientists to communicate with entrepreneurs of the middle and small scale materials companies. C-MRS organizes the meeting for this kind communication at various regions in China, including industrial parks in Jinshan (Shanghai), Ningbo (Zhejiang Province), Dezhou, Rizhao and Zibo(Shandong province), et al. to receive good results and response.

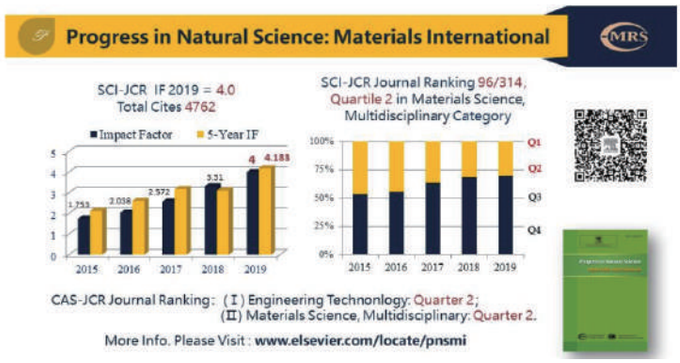
Consulting projects of CAST During the recent years (since 2015) C-MRS undertook the consulting projects. The projects include " New materials and future science and technology in coming 30 years " in the year of 2015, " Analysis and evaluation of talents in the field of materials R & D" in 2016, " Analysis of Frontier Materials in the world" in 2017, " Analysis of hot topics in materials research " in 2018, and "Survey and analysis of graphite related materials in China" in 2019, et al. All these projects finished very successfully, provide very useful information for central and local governments.

4.5.10 Publications

Conference Proceedings C-MRS has published proceedings of all the conferences held during the last 30 years in Chinese or English co-operated with other publishers. C-MRS has very good relationship with world-wide famous publishers, including Trans Tech Publications Ltd., Springer Ltd. and the Institute of Physics Publishing, as well as many domestic publishers. The high-quality publication of the conference proceedings and the precise service for the authors are the important to attract more and more participants of the conference.

Journals C-MRS sponsored or co- sponsored six journals, including "Chinese Journal of Materials Research"; "J. Materials Science and Technology "; "Journal of Functional Materials and Devices"; "Rare Metal Materials and Engineering"; "Materials Progress in China" and "Progress in Natural Science: Materials International " (PROG NAT SCI-MATER).The journal of "Progress in Natural Science: Materials International" is sponsored by C-MRS and IUMRS, managed only by C-MRS and published by Elsevier Ltd. With the financial support of Chinese government and great efforts from the editorial members and the hard working of editorial office staffs the journal is running

smoothly and the impact factor (IF) was 3. 31 and expected IF in 2019 will be more than 4.0.



Annual Series Report on New Materials Industrialization in China C-MRS has edited and published the series "Report on Advanced Materials Industrialization in China" every year, commissioned by the "*National Development and Reform Commission of China"* since 2004, and "*National Development and Reform Commission of China" and "Ministry of Industry and Information Technology of China"* since 2014.

Handbooks and Comprehensive Dictionary More than 10 special and important publications on materials science and technologies have been published by C-MRS with thousands of pages. For example, "China Materials Engineering Handbook" was organized and published in 1990s with 26 volumes contributed by hundreds of C-MRS members who are well-known materials professors and experts in China. The "Materials Comprehensive Dictionary "and "Comprehensive Dictionary of Materials" (second edition) were published in 1994 and 2016, respectively.

Materials Series Books During the last 10 years, C-MRS organized the members to write dozens of academic books in the field of materials. The first popular science book titled with "*Approaching Frontiers of New Materials*" has been published in 2019, and the book has received very good response and evaluation. The next books will be issued soon.

4.6 European -MRS

Prof. .George Kiriakidis

A Bird's Eye View by Prof. George Kiriakidis, President of E-MRS, Greece (2017-2019), as current president of the European MRS (E-MRS).

I have enjoyed the privilege of being only loosely attached with the IUMRS's almost 30 year-long history. However, through the numerous international initiatives which span beyond the organization of annual/bi-annual international conferences and meetings all over the globe that include activities with a global reflection such as the World Materials Summits, the Sômiya Award, the Global Leadership and Service Award, the Global Materials Network (GMN) for Young Researchers and others, I had the unique opportunity to meet and collaborate with prominent scientists and researchers from around the world along with materials personalities both from renounced institutions, academia and industry, exchange views and plan for collaborations.

IUMRS, as the umbrella of more than 14 MRS Adhering Bodies from all over the world has managed to coordinate scientific and research activities in all continents and give the opportunity to scientists-particularly- youngto look into the future of materials as the means to create a better future. The enthusiasm and inspiration provided to the young generations from the prominent leaders and members of the IUMRS board will be proven invaluable for the future of our society.

I am sincerely looking forward to the expansion of the IUMRS activities and its more active involvement on shaping the future of young materials researchers.

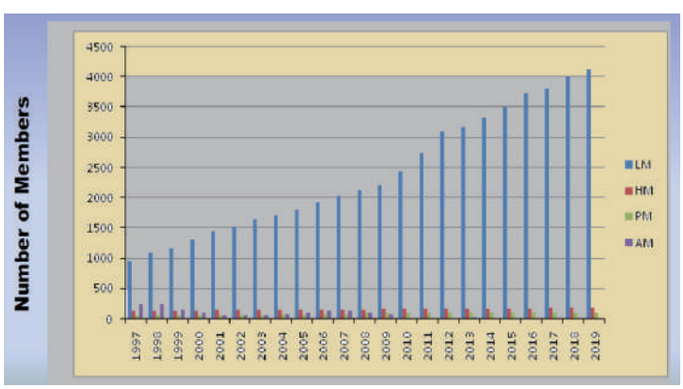
Prof. George Kiriakidis
E-MRSPresident (2017-19)

◎ George Kiriakidis, Professor, Head TCM Group / IESL, FORTH, Greece.
https://www.physics.uoc.gr/en/faculty/g.kiriakidis

4.7 MRS-India

The Materials Research Society of India came into existence in February 1989, thanks to the farsighted vision of Prof. C N R Rao. Prof. Rao functioned as the first President and laid the foundation for its impressive growth over the past 3 decades. He was succeeded by Prof. P Rama Rao, Prof. S K Joshi, Dr. R Chidambaram, Dr. D Chakravorty, Dr. Mashelkar, Dr. T Ramasami, Dr. G Sundararajan and Dr.Suresh Das as Presidents. Currently Prof. S B Krupanidhi serves as the President of MRSI.

MRSI is dedicated to the development and expansion of materials science and technology base in India and to serve as an interdisciplinary forum for professionals involved in research, technology and development and use a whole range of structural and functional materials. MRSI functions through 23 Regional Chapters and 11 Subject groups. MRSI is supported by individual members and institutions who will be patrons of the society. Its current membership includes 4124 Life members, 173 Honorary members and 84 Patron members amounting to a total of 4381 members.



The graph indicates the growth of membership from 1997 to 2019 (September)

4.7.1 Activities (national)

The activities organized by MRSI basically include the following categories: Lectures, Seminars, Chapter AGM, AGM's with Indian Materials Conclave, Award Lectures, Theme symposia, Council Meetings.

4.7.2 International links of MRSI

MRSI is a founding adhering body of the International Union of Materials Research Societies(IUMRS) and participates in the international arena of materials research. MRSI has hosted the following conferences in Bangalore, India:

IUMRS-ICA in 1998
IUMRS-ICAM in 2007
IUMRS-ICA in 2013
IUMRS-ICYRAM in 2016

IUMRS-ICA 1998

IUMRS-ICAM 2007

IUMRS-ICA 2013

IUMRS-ICYRAM 2016

4.7.3 Asia Pacific Academy of Materials(APAM)

MRSI is a founding member of Asia Pacific Academy of Materials (APAM). Prof. CNR Rao is its Founder President. Prof. O N Srivastava serves as the President of APAM India chapter. The APAM India Chapter holds its annual meeting in conjunction with the AGM of MRSI. APAM has members from India, Australia, China, Hong Kong, Japan, Korea, Mongolia, Russia, Singapore, Taiwan and Uzbekistan. APAM-India Chapter has more than 100 members.

4.7.4 Bulletin of Materials Science

MRSI co-sponsors the publication of Bulletin of Materials Science (BMS) published by the Indian Academy of Sciences.

BMS Website

http://www.ias.ac.in/matersci (full text available)

MRSI Website

http://www.mrsi.org.in

MRSI Newsletter

The MRSI has been regularly publishing the MRS Newsletter. This is a quarterly publication. Several issues have been brought out successfully for the past seventeen years.

Editor: Dr. K K Nanda

Commenced in April 2001.Successfully brought out 67 issues so far.Since 2009 only electronic version of the newsletter is being brought out.

4.7.5 Students' Projects

MRSI is partially supporting upto 10 projects of students (B.Tech, M.Tech, ME, M.Phil, Ph.D) in the area of Materials Science and Technology under the supervision of MRSI member. Currently, this support is in the form of travelling grant to present their project work in the MRSI AGM.A good number of students have been granted support so far.

MRSI recognizes contributions to materials research through the following:

- International Medal for Materials Science and Technology
- MRSI Silver Jubilee International Medal
- CNR Rao Prize Lecture in Advanced Materials &Distinguished Materials Scientist of the year Award
- MRSI-ICSC Superconductivity & Materials Science
- Senior Award
- Distinguished Lecturership Award
- MRSI-ICSC Superconductivity & Materials Science
- Annual Prizes
- MRSI Medal Lectures
- Honorary members

4.7.6 Annual general body meetings

The Annual General Body Meeting of MRSI is held inFebruary every year. So far 3300 AGMs have been held by different chapters of MRSI.

MRS-India annual general meeting 2009

MRSI annual general meeting 2019

Contributed By Contributed
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4.8 MRS-Indonesia

Ten years of MRS-Indonesia

by Prof. EvvyKartini, President of MRS-Indonesia

4.8.1 History and goals of MRS-INA

1) The Milestone of MRS-Indonesia

The Milestone of MRS-INA (2010-2020)

2) The goals of MRS-INA

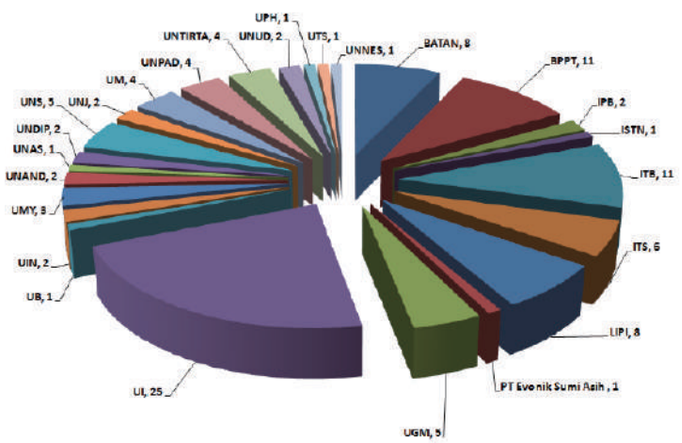
International Conference on Materials Science and Technology 2010 (ICMST2010)
President of IUMRS (2009-2010) ,Prof.Dr. Chowdari attended the ICMST 2010

Materials Research Society Indonesia (MRS-INA) or in Indonesian called as *Perkumpulan Masyarakat Riset Material-Indonesia*, was established in April 15, 2011. The goal of MRS-INA is to promote the materials research activities in Indonesia into International forum by representing the materials research societies in Indonesia to the International Union of Materials Research Society (IUMRS). Another goal is to open national and international networking in the field of materials research, and to promote its applications in various areas of industries. MRS-INA has also responsible to educate and train young researchers or students about the materials knowledge and characterizations. Since the beginning, MRS-INA was launched by President of IUMRS (Prof. Chowdari) in 2010. The founders of this organization were coming from various institutions and universities in Indonesia, showing that the MRS-INA is unity in diversity of materials societies.MRS-INA act by law was signed in April 15,2011. However, due to the change of administration in the law-office, it was just released in January 2017

4.8.2 Membership of MRS-Indonesia

In 2020, MRS-INA has more than 400 members from industry, government, academia and research laboratories, who meet regularly to discuss recent technological developments of functional materials. The MRS-INA differs from many single-discipline professional societies by encouraging scientists, engineers and research managers to exchange information on an interdisciplinary platform, and by recognizing professional and technical excellence. The members that have PhD degree are 120, they are mostly researchers and lecturers from various universities and institutions in Indonesia. These, name can be observed in our website.

Students and other researchers are automatically become the member of MRS-INA when they attended the conference or workshop organized by MRS-INA. The members of MRS-INA are representing various National institutions whish spread out all over Indonesia.



Member of MRS-INA with PhD degree and diversity of Universities /institutions

The individual member becomes a member at first automatically via the conference organized by MRS-INA. Some other individual members have been told or invited by member. We open also the website http://mrs-ina.org for registration as member. ***Profile of the geographic and/or national extent*** of the region primarily are served by the applicant organization.

Indonesia is located in between two continents, Australia and Asia, and two Oceans, Pacific and Indonesian Ocean. It is part of the South East Asian Country, and it is very close to Singapore. Indonesia has the fourth largest population in the world. Indonesia has a potential to grow the material scientists in various subject or areas, and gather them into a solid materials research society.

4.8.3 The Logo of MRS-Indonesia

Old:Representing Indonesian's Flag

New: Representing Indonesian's Island

4.8.4 Summary of previous activities of MRS-INA

MRS-INA has various activities e.g. meetings and workshops organized or sponsored, awards, publications, training, etc. Those activities are as follows.

- International Conference on Materials Science and Technology 2010 (ICMST2010),
- Workshop on Solid State Ionics 2010
- Neutron and X-ray National Seminar 2013
- International Symposium on Nano Materials 2013 (ISN2013)
- International Conference on Materials Science and Technology 2014 (ICMST2014)
- International School on Solid State Ionics 2014
- Active Learning in Optics 2015 (ALOP2015)
- Neutron and X-ray National Seminar2015
- Atom Indonesia Best Paper Awards 2016 (co-organizer)
- Workshop on Writing Article in International Journal2016 (co-organizer)
- Workshop on Materials Characterization 2017
- Organized the MRS-INA Conference and Congress in Yogyakarta, October 8-12, 2017
- Organized the ICA-IUMRS in Bali, October 29-November 2, 2018
- Organized the ICAM-ICMR 2019 in Sentul, Indonesia, 8-12 October 2019
- Organized International Workshop on Lithium Ion Battery in Aston, Sentul, 8-9 October 2019.

Most of the activities involved international keynote speakers with the participants from various countries. Some of the photos and documents of the activities are shown as following.

Asian Workshop on Solid State Ionics,Serpong, Indonesia, October 19 2010

Battery School &Aonsa Neutron School , Batan, Serpong, October 13-18, 2014

International Conference on Materials Science and Technology 15 October 2014

Workshop on Active Learning in Optics and Phtonics (ALOP) " Celebrating the International Year of Light 2015", Serpong, March 23-27, 2015

4.8.5 Joining IUMRS

4.8.5.1 Starting to involve International Union of Materials Research Societies (IUMRS) at Suntec, Singapore, 2016

General Assembly of IUMRS2016 in Singapore, Suntec Singapore, July 3-5, 2016, Planning IUMRS-ICA in Bali, 2018

The General Assembly of IUMRS 2016 was held at Suntec City, Singapore with the host society of MRS Singapore. Prof. Dr. Evvy Kartini, the President of MRS-INA, was invited to attend the meeting to introduce the activities of MRS-Indonesia. The meeting in Singapore attracted other societies such as MRS Thailand, MRS Vietnam and MRS Malaysia to apply for the membership of IUMRS. Furthermore, during the official dinner, it was discussed among the Asian members that MRS-Indonesia should organize the International Conference in Asia (IUMRS-

IUMRS officers and presidents of IUMRS ABs at 6th World Materials Summit

The delegations from MRS-INA, Prof. Dr. Herman Yuwono and Dr. Chairul Hudaya and Prof. Evvy Kartini at 6th World Materials Summit

ICA) 2018. Prof. Evvy Kartini accepted this sugges

The president of MRS-Indonesia, Prof. Evvy Kartini started to join the activities of IUMRS since 2016, including to participant 6th World Materials Summit, in Rizhao, China, October18-20, 2016; IUMRS-ICA2016, in Qingdao, October 21-24, 2016; IUMRS-ICAM2017, in Kyoto, Japan, August 27-31, 2017. And MRS-Indonesia hosted IUMRS-ICA2018 in Bali, Oct. 30-Nov. 2, 2018, successfully.

4.8.5.2 Officially accepted as a member of IUMRS in Kyoto, Japan, August 27, 2017

President of MRS-Indonesia, Prof. Evvy Kartini was invited to attend IUMRS GA meeting in Kyoto, Japan, August 27, 2017 to apply for the membership of IUMRS. MRS-Indonesia was officially accepted as a member of IUMRS based on the voting result of IUMRS adhering bodies.

Left photo: The participants of IUMRS General Assembly in Kyoto, August 27, 2017. They represented the adhering bodies of IUMRS (MRS-Australia, MRS-Brazi, C-MRS, E-MRS, MRS-India, MRS-J, MRS-K, MRS-Mexico, MRS-Singapore, MRS-T, MRS-Thailand).

Right photo: Dr. John Baglin (USA), the membership commission chair congratulated Prof. Evvy Kartini for the acceptance of the MRS-INA as the member of IUMRS.

4.8.5.3 Holding the First MRS-INA Conference after becoming IUMRS member

IURMS President, Prof. Soo Wohn Lee opened the MRS-INA Conference on October 8, 2017 and presented the certificate of membership to Prof. Evvy Kartini, the President of MRS-INA.

The first conference after become adhering body of IUMRS was held in Yogjakarta, October 2017. The President of IUMRS, Prof. Soo Wohn Lee, attended the conference and officially launched the conference, and presented the certificate of membership IUMRS to the MRS-INA. More than 400 participants from15 countries and domestic universities, institutions and privates attended the conference. Prof. Evvy Kartini was chosen to lead the MRS-INA, as the President.

Group photo of MRS-INA Committee members with Prof. Soo Wohn Lee (IUMRS president) and Prof. B.V.R. Chowdari (President of MRS-Singapore

4.8.5. 3 Holding IUMRS-ICA 2018, Denpasar Bali, Indonesia, Oct. 30-Nov. 2, 2018

Group photo of IUMRS-ICA 2018, Bali, Indonesia

IUMRS officers with the Indonesia Government leaders at IUMRS-ICA 2018

MRS-INA organized the International Conference in Asia of IUMRS (ICA-IUMRS) at the Anvaya Hotel, Denpasar, Bali, Oct. 30-Nov. 2, 2018. It was a great challenging for the Indonesian society to have this opportunity. More than 400 participants came from more than20 countries, including several countries in Europe and Asia, Australia, and America. The President of IUMRS, Prof. Soo Wohn Lee and the First Vice President, Prof. Yafang Han and presidents of MRSs from Korea, Australia, Japan, Thailand, Singapore attended the conference. There were also directors from International Neutron facilities attended the conference and deliver inspiring lectures.

The chair of the conference, Prof. Anne Zulfia from the University of Indonesia, the chair of presidential advisory body, Prof. Dr. Sri Adiningsih and the rector from University of Udayana attended the opening ceremony of IUMRS-ICA 2018. And Prof. Dr. Sri Adiningsih gave a speech at the opening ceremony.

The papers of ICA-IUMRS2018 were published on The IOP Materials Science &Engineering (67articles), IONICS Journal (12 articles), PNS:MI Journal (7articles) and Atom Indonesia (5 articles), respectively.

4.8.5.4 OrganizedICAMT2019&ICMR2019andInternationalWorkshop on Lithium Ion Battery

Group picture of the participants of ICAMT2019 & ICMR2019

MRS-Indonesia has been successfully organized International Conference on Advanced Materials Technology2019(ICAMT2019) & International Conference on Multi-disciplinary Research (ICMR2019) at Aston Hotel International, Sentul, Bogor,8-9October2019. IUMRS president Prof. S. W. Lee attended the conference.

During the conference the International Workshop on Lithium Ion Battery was also organized with the participants from various institutions, universities and industries (55%). During the opening ceremony of the workshop, the consortium battery launched the National Battery Research Institute (NBRI). It was explained in more detail during the closing by Prof. Evvy Kartini, the idea and the goal of NBRI. Then, after the meeting Prof. Alan Drew, mentioned that the NBRI was a great idea and it has to be established, like the one Faraday Institution in UK. As the implementation of the MoU between MRS-INA and QMUL, UK, it was followed by the application of the

Global Challenge Research Fund (GCRF) by Prof. Alan J. Drew with the partner Prof. Evvy Kartini, to establish the National Battery Research Institute (NBRI). The grant was accepted in January 2020, then, it officially established in December 2010, as the Foundation of Center Excellence Innovation of Battery and Renewable Energy. Prof. Evvy Kartini as a founder of NBRI, and Prof. Alan Drew as a co-founder of NBRI.

IUMRS president Prof. S. W. Lee opened the conference (left one) and Signed MoU between MRS-INA & ANU-Australia; QMUL, UK; B4T, Kemenperin; IMMI, Inalum and MTM, ITB(right one)

4.8.5.5 Attended IUMRS-ICA2019, Perth Australia, Sept. 22-26, 2019 and IUMRS World Materials Summit, Hangzhou, China Oct. 23-26, 2019

IUMRS informal GA meeting during IUMRS-ICA 2019

Group Photo of IUMRS World Materials Summit, Hangzhou, China, Oct. 23-26, 2019

Prof. EvvyKartini met IUMRS members at IUMRS WMS, Hangzhou, China, Oct., 20

Prof. Evvy Kartini with leaders from E-MRS, MRS-Japan, MRS-Taiwan and MRS-Thailand during IUMRS WMS, Hangzhou, China, Oct. 23-26, 2019

4.9 MRS-Japan

The Materials Research Society of Japan (MRS-Japan) has just celebrated the thirtieth anniversary. In this article, the activities related to MRS-Japan and IUMRS in the last thirty years are briefly described.

4.9. 1. Early days

It has globally been recognized that the innovation and new materials development are the complementary to each other and together constitute the key for future scientific and technological progresses. In order to achieve a sustainable society and life, and to solve the critical issues that the humankind is currently facing, such as environmental and energy problems, with their multiple facets and interwoven elements, the developments of new materials and advanced technologies are of crucial importance. For this kind of research and development of new materials, it is vital to discard the conventional classification of material species among metals, organic andinorganic materials, or structural and functional materials, in accordance with various industries, such as industries of chemicals, steels, machines, foods, medicals, transports, information technology, etc. and to take interdisciplinary/multidisciplinary approaches in cooperation with experts of diverse materials science and engineering fields.

Picture 1: Professors M. Doyama and S. Somiya.

According to these understandings, Professor R. P. H. (Bob) Chang (Northwestern Univ., U. S. A.) came to Japan in 1985 to discuss the establishment of Materials Research Society of Japan [1, 2] with Japanese scientists including Prof. Masao Doyama and Prof. Shigeyuki Somiya (Picture 1). At that time, MRS (est. 1973) was a very active society. European MRS had been established in 1983. Doyama and Somiya discussed Bob's proposal seriously. In order to see the reaction of scientists and engineers to materials research, they decided to organize an international conference at Sunshine City, Ikebukuro, Tokyo from May 30 to June 3, 1988. There was extensive cooperation to the conference from Nikkan Kogyo Shimbun, Co. Ltd.The conference attracted over 1600 scientists and engineers from 25 countries and was a success. With this success, Doyama, Somiya, Dr. Kiyoshi Inoue, and Mr. Yoshitaka Agata met in Tokyo on March 16, 1989 to establish Advanced Materials Science and Engineering Society (AMSES). AMSES changed its name to MRS-Japan in 1990, because the name of MRS was more widespread than AMSES.

4.9.2. Activities in Thirty Years (1989 to 2019)

Picture 2: Dinner at the 30th Anniversary of MRS-Japan.

Since its establishment, the MRS-Japan has promoted research & developments and industrial applications of advanced materials science and technologies, via the interdisciplinary research activities of scientists and engineers and their global cooperation. As one of activities, MRS-Japan has organized many annual meetings (domestic meetings) and international conferences. In these domestic meetings, there were about 20 symposia. Each symposium was organized by about 10 scientists in average. Topics of symposia were in the area of nano-materials, biomaterials and soft materials, new technologies and techniques, computational science, energy and environmental issues, interdisciplinary materials, education, etc. The most well-recognized contribution of MRS-Japan to the community is Award for Encouragement of Research (Young Scientists Award). International conferences MRS-Japan held were those related to IUMRS, as will be shown in next section.

As for the memorial events, the MRS-Japan celebrated its 10th anniversary of establishment at Ishigaki Memorial Hall in Tokyo, September 17, 1999. This memorial event featured seven major lectures covered by various fields from science and technology. The details can be referred to the MRS-J News issued at that time. The MRS-Japan 20th Anniversary Symposium was successfully held on December 6, 2009 at Yokohama Media & Information Center. This symposium was organized by MRS-Japan, discussing on "Materials for 21st Century" as the main theme. The Thirtieth Anniversary Symposium was held on November 29, 2019, the last day of annual meetings (Picture 2). In the symposium, the president stressed that the existence of societies relating to any kind of materials was in danger and that we had to change the way of thinking.

The MRS-Japan has been publishing Newsletters four times in a year since 1989 and Transactions of the Materials Research Society of Japan four to six times a year since 1990.

4.9.3. Relation to IUMRS

We congratulate IUMRS on its 30th Anniversary. The International Materials Research Committee was established in September 1989 and AMSES was recognized as one of the funding societies of this committee. Then the International Union of Materials Research Societies (IUMRS) was established in 1991 consisting eight Materials

Research Societies from around the world including MRS-Japan. In 1993, the 3rd IUMRS-ICAM conference was held again at Ikebukuro, Tokyo. The conference in 1988 was recognized as the first IUMRS conference. Since then, the MRS-Japan has organized international conferences and symposia under the cooperation with the IUMRS (Picture 3 (a), (b), and (c)), such as IUMRS-ICA'97 (Makuhari, Sep. 1997), IUMRS-ICAM 2003 (Yokohama, Oct. 2003), IUMRS-ICA 2008 (Nagoya, Dec. 2008), IUMRS-ICEM 2012 (Yokohama, Sep. 2012), IUMRS-ICA 2014 (Fukuoka, Aug. 2014), and IUMRS-ICAM 2017 (Kyoto, Aug. 2017). The IUMRS-ICA 2008 attracted more than 1800 participants with 50 symposia. The MRS-Japan cooperates with and actively participates in the IUMRS conferences. The IUMRS conferences are growing year by year and keep providing materials scientists and engineers with unique opportunities to highlight their R&D achievements and to develop the international networking. Recently, the MRS-Japan has initiated MRM 2019 (Materials Research Meeting) as one of international conferences.

In addition, the MRS-Japan has been sending several of its members to IUMRS to serve as president, vice-president, treasurer, and others.Somiya Award for International Collaboration (Picture 4) is the most well-known contribution of the MRS-Japan to IUMRS. It has been given to group of researchers since 2000. The MRS-Japan is organizing bilateral symposia with European MRS and Australian MRS.

Picture 3: (a) A scene at IUMRS-ICA 2008; (b) A scene at IUMRS-ICEM 2012
(c)A scene at IUMRS-ICAM 2017;(d)Somiya Award.

References

[1] S. Somiya, Trans. Mat. Res. Soc. Japan, 20th Anniversary Special Issue, 1-4 (2012).
[2] M. Yoshimura, Program book of the 29th Annual Meeting of MRS-Japan, page 28 (2019).

4.10 MRS-Korea

Recent 10 years of MRS Korea

Prof. W.-G. Jung

Congratulations to IUMRS for its 30 years anniversary. Thanks to the former executives and adhering body members of IUMRS.

The Materials Research Society of Korea (MRS-Korea) was established on February 23, 1991 under industrial/academic/institutional cooperation in order to contribute to activate the materials research and to bring together a wide variety of knowledge in physics, chemistry, bio technology, semi-conductor, electronics, agriculture, etc. as well as to facilitate the activation of an industry-university technology exchange in materials science and engineering fields of metals, electromagnetics and new materials.

We have about1400 members in the society, including life, regular, student, and institutional members. In order to respond to the demands of the era, the Materials Research Society of Korea is continuously changing and growing under the support of the academia and industry for the development of the materials industry, which is the basis for the growth in Korean economy and industry. Our society has a wide range of subjects in all fields of materials science and engineering, and is providing a platform for exchanging people who are responsible for the development of science and technology related to materials from senior scientists to students.

There have been numerous societies active in promoting materials research in areas such as metal, ceramics and polymers. However, as the materials used in modern advanced industries must have characteristics of high performance, multi-functionality and accuracy due to the complex manufacturing processes, it was necessary to create an integrated database of "materials science and engineering" to comprehensively deal with metals, electronics, ceramics, polymers, etc.

Under our objectives of the society, the MRS-K has published "The Materials Research Society of Korea Journal", first in a quarterly edition from June 1991, followed by monthly journals since 1997. The journal publishes papers, reviews, breaking news and simplex about materials science and engineering according to the purpose of the society's establishment. This journal of now indexed in SCOPUS and ESCI as well as KCI (Korea Citation Index).

The main purpose of MRS-K conference is to contribute the development of materials-related science and technology by providing the platform that researchers and graduate students who are engaged in materials related research at universities, national research institutes and industrial institutes present and discuss their recent results and latest technology information.

The MRS-Korea domestic conferences and symposia

The society has been hosting two domestic conferences (Spring and Fall) regularly every year since 1991 to promote communication and cooperation between academia and industry. Also, we are organizing the New Material Special Symposium in parallel with the conference from the year 2000 to focus on timely, important technologies in fields of energy, the environment, fusion technology, etc. In 2019, 8 Special Symposiums were held in the Spring and the

International conferences hosted by MRS-Korea

Fall meetings each.

In support of IUMRS, MRS-Korea has also been continuously hosting international conferences including the IUMRS-ICA (2012), the IUMRS-ICAM (2015), the IUMRS-ICEM (2018). We also held international joint symposiums including the Korea-Mexico Joint Symposium and theJoint Symposium between the European MRS and the MRS-Korea to facilitate the collaborative research between those societies. In upcoming 2021, the MRS-K is going to host the IUMRS-ICA in Jeju, Korea. We would like to invite many scientists from around the world and look forward to the cooperation of the IUMRS members.

MRS-Korea will continue to contribute to the development of the fields of materials science and engineering in Korea and in the world. Recently the boundary between sciences and technologies has dimmed and various fusion technologies have emerged. Thus, MRS-Korea will continue to play a role in communicating people from different scientific areas and will become a key center of research activity.

I wish the success of the IUMRS in future in the materials research community.

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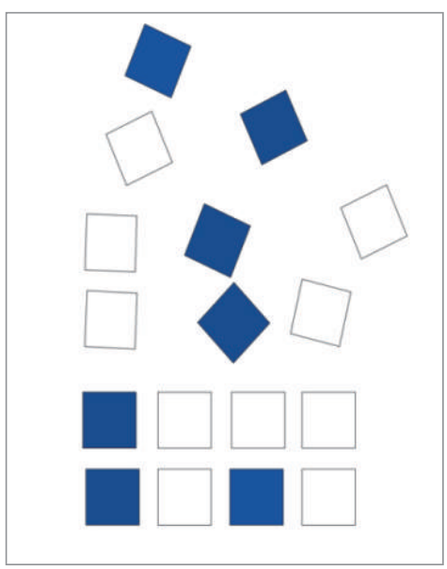
4.11 MRS-Mexico

By Sergio Javier Mejia Rosales, President of MRS-Mexico

4.11.1 Introduction

The Mexican Materials Society (SMM), in coincidence with IUMRS, celebrates this year its twentieth anniversary. Overcoming some initial resistance by several groups that considered unnecessary the existence of a Mexican association intended to group the different areas of materials science, the Mexican Materials Academy (the original name of SMM) was finally officially established on 1991. Since its early beginnings, the SMM differentiated itself from other scientific societies recently created at that time in Mexico, both because it's multidisciplinary character, but also because the enthusiasm and determination of their founding members. As a natural consequence of the momentum impressed to the Academy, its membership started to grow rapidly, and the International Materials Research Congress, organized yearly by the SMM, became its flagship event, and one of the most highly reputed academic events on Materials Science in Latin America.



The logo of mexican materials society.

IMRC staff, taking a break at the poster session. IMRC-2006.(Gutiérrez-Wing personal collection)

marinero, at the nanostructured materials and nanotechnology symposium. imrc 2006.(gutiérrez-wing personal collection)

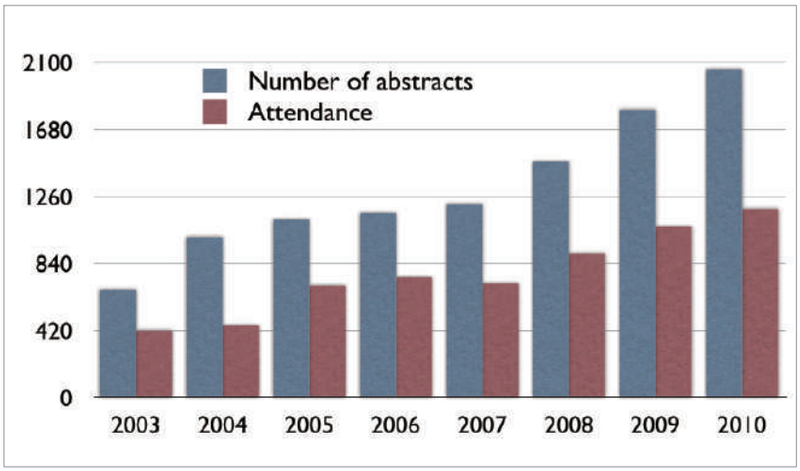
4.11.2 The International Materials Research Congress

The International Materials Research Congress was created with the main purpose to provide the SMM members with their own forum of discussion on the most recent advances in materials science and technology. This response of the Mexican materials community to this effort was almost immediate; several symposia were proposed, and some of them had such a big response that they still exist, with different levels of evolvement and rates of growth. The stability of these groups of symposia has been one of the features that gives the IMRC its own personality. Another personality trait of the congress —at least in recent years— is, of course, the city and beaches of Cancun.

The IMRC have been organized yearly by the SMM every august, with an exception: in August 14, 2007, Tropical Storm Dean reached the coasts of Cancun, to became a hurricane just two days later. On August 17, the IMRC was officially delayed until further notice. Eventually, the IMRC was re-scheduled to be on November, but part of the damage was already done: some invited speakers cancelled their participations, and the regular attendance was somewhat diminished. But even on those circumstances, the quality and good spirit prevailed, and the 2007 version of IMRC was a very enjoyable experience for those of us who were able to attend.

J. Méndez Nonell, president of the SMM, gives a diploma to M. Gracia on the Best poster contest.IMRC 2007.

Posters Session. IMRC 2008.



Received abstracts and registered attendance at the IMRC.

Since 2009, The SMM has partnered with the Materials Research Society in the organization of the IMRC. This alliance, a natural outcome of the internationalization of science and of the maturity of the SMM, increased the offer of symposia and reinforced the international character of the Congress. For 2011, the program of the IMRC includes 23 symposia, four plenary contributions by worldwide known specialists (Eduard Arzt, from the Leibniz Institute for New Materials; Ivan K. Schuller, from UC San Diego; SumioIijima, from Meijo University, Nagoya, and Dan Shechtman, from Technion - Israel Institute of Technology,) tutorial courses, and commercial exhibits.

One of the key elements of the IMRC —and of the SMM efforts— is the participation and support of students. Every year, the SMM offers scholarships and registration exemptions to graduate students that present their research work at the congress, and SMM and MRS jointly give prices to the best poster presentations. In the last years, the SMM grew at a great pace in number of member in level of internationalization, and in quality of its Congress. Today, its membership fluctuates around 1800 regular members, and its partnership with peer societies (IUMRS, MRS, Mexican Society Crystallography, National Association of Corrosion Engineers, and Virtual Center Mexico-Brasil on Nanotechnology) clearly shows its tendency towards collaboration, and demonstrates the real international outreach on the materials community.

4.11.3 The current state of SMM

The evolution of the SMM can be measured by the participation of its foreign and Mexican members at the International Materials Research Congress, the creation of new and consolidation of already established strategic alliances, the active participation in other events, and the constantly increasing promotion of its members and the academic development of students. One of the natural consequences of this evolution is the appointment in 2010 of our first Executive Director, and the establishment of a permanent office in Mexico City. The new management scheme will allow us to work even more efficiently in achieving our goals.

For 2011, the main activities of the SMM will be guided by two general ideas: 1) to strengthen the position of the SMM among their peers, and 2) to reinforce the position of the SMM as the natural speaker in front of government, academia, and industry, on issues related to materials science and technology. In accordance with these two ideas, the IMRC keeps its place as the flagship of the SMM, being the forum through which the community identifies the materials society. Complementing the activities directly related to the IMRC, the SMM will also work on other ways to increase the outreach with other societies, academic institutions, and the general public.

4.11.4 The Origins of the Mexican MRS

Prof. Miguel Jose Yacaman

My first contact with the MRS came in the fall of 1982 when I presented an invited talk at a symposium on catalysis organized by Kamil Klier. The first session was on electron microscopy. The first speaker was Albert Crewe of the University of Chicago who gave a splendid talk on STEM and showed individual atom images (Back in 1982). I was the second invited speaker and I can still recall the strong atmosphere in the room charged with the interest of the audience. I felt a great interest in my talk and I really enjoyed the rest of the meeting. It was a small gathering maybe 500 people all together in a small, cute Boston hotel called the Park Plaza. I was just amazed by the composition of the people: The catalysis bunch,, the surface science guys, the electronic fellows , the polymeric, the theoretical, etc. It was great! I became a regular to the fall meeting and watched the slow growth from the Park Plaza to the Marriot and the Westin, to the spring meeting to the huge meeting.

I began convincing many of my colleagues at the Institute of Physics at UNAM to join me in attending the MRS Boston Meeting. By 1989 it was clear that we needed to form a Mexican Society. The core of people attending the MRS meetings was from the Institute of Physics of UNAM. At that time I was director of the Institute and had some leverage to organize.

The first closed-door meeting was called on the grounds of the Physics Institute UNAM in 1989 to discuss the formation of a society on a broad basis. The meeting, however, did not go well. The members of the polymer society, the metals society and ceramic were not happy about a new society. We adjourned without a consensus. After the fiasco the small group at the Institute of Physics at UNAM kept the spirit and was able to convince a few others little by little.

We then decided in 1990 to form the society officially. We chose the legal name of “Academia Mexicana de Materials”; the document was signed by 10 persons at the public notary and registered in the public archives of societies. All the members were Mexican but one, Mr. Yoshio Noguchi, Director of JEOL Mexico, who became a materials promoter and was a Japanese national. At that time Mexico was still a bit isolated country and the presence of a non-Mexican induced additional legal procedures. Dr Miguel Jose Yacaman was elected first President.

Anyway the Mexican MRS was launched in paper. We organized the first National Materials Meeting In Mexico City in 1991 where we used the Radisson Hotel In Mexico City. We had a good attendance of about 200 people. We needed a launching event with event with enough credibility and attraction to establish the society. The opportunity came soon. In 1990 Dr. Miguel Jose Yacaman was associate editor of Acta/ScriptaMetallurgica. The journal organized a small workshop in Atlantic City to discuss the future of a new emerging field: Nanoscturtured Materials. (This was 10 years before NSF launched the nanotechnology initiative). The group, which included several prominent researchers, examined the possibility of tailoring mechanical properties of materials by reducing the grain size. The panel decided that it was time for an international meeting sponsored by Acta/Scripta to discuss Nanostructures. An international standing committee and a new journal were created. In that meeting Dr. Miguel Jose Yacaman offered that the Mexican MRS could host the meeting. The offer was accepted and the meeting set for 1992. We used the first International Conference on Nanostructured Materials to combine with the national meeting of the Mexican MRS. There was only one question left: Where to organize the meeting?

Then it was necessary to combine good science with some attractive place. In Mexico there was a tradition of holding meetings in dull places, such as university classrooms or resorts linked to the Mexican social security system. It was necessary to show that scientists were austere almost as Benedict Monks. We decided to try something more attractive - Cancun. This was a spectacular beach resort with air communications as good as any big city in the world and many hotels. With the initial support of Conacyt, we were able to organize the meeting. It was a great risk because it was possible that Mexican attendants will not be allowed to travel to a Resort Nevertheless we broke the initial barrier had many Mexican scientists who attended attracted by the quality of the speakers that included SumioIjima, Rick Smalley, Ivan Schuller, Bob Schuill, Dick Siegel and many others. The second national meeting was

organized in parallel by David Rios, who became the second president of the M-MRS.

The meetings were a great success and established the society for good with Cancun as its home. During the following years several meetings took place at the same time as the first Mexican MRS meeting and all those meetings helped to integrate other groups such as the Electron Microscopists, the metallurgists, the corrosion specialists, the art and archeology and many other groups became integrated over the years.

A very important aspect of our society is that we were founding members of the IUMRS. That was an important part of our activity. Mexican MRS hosted the ICAM meeting in 1997 and then again in 2001.

So the small group of 10 persons was able to organize a society that grew to be one of the biggest in Mexico and with an annual meeting with ~ 1200 papers presented. It has become the premier place for Mexican scientists to present their materials related research and to interact with the international community.

SumioIjima, Yoshio Nogushi, Miguel Jose Yacaman et al.

JEOL Team Yoshio Nogushi and Mark Kersker with IMRC Secretaries

4.12 MRS-Singapore

20-year Legacy of MRS Singapore Together with IUMRS

Prof. B.V.R. Chowdari

Congratulations to IUMRS and its leadership for reaching the milestone of 30 years. Thanks to the founding fathers and subsequent leadership for their vision and dedicated hard work in bringing IUMRS to what it is today.

It is my pleasure and honour to write this note on behalf of the Materials Research Society of Singapore (MRS Singapore). The success story of MRS Singapore could be partly attributed to its' strong association with IUMRS as an adhering body member.

MRS Singapore was founded in 1999 with limited membership and no track record or credibility or financial resources when it became a member of IUMRS in 2002. This could happen only after MRS Singapore successfully organized its' 1st "International Conference on Materials for Advanced Technologies (ICMAT)" in the year 2001. This certainly testifies to the high standards IUMRS looks for before it enrolls a new member.

As an adhering body of IUMRS, MRS Singapore took several initiatives including organising all IUMRS conferences (ICAM, ICEM, ICA and ICYRAM) one time or more.

The founding of IUMRS – ICYRAM series goes to the credit of both MRS Singapore and IUMRS. As the then President of IUMRS (2011-2012) and MRS Singapore, I proposed the concept of bringing young researchers to a common platform where they can share their ideas and expertise with other young colleagues. The response I received for such an initiative from the then IUMRS Executive Committee and General Assembly was immense; to the

extent IUMRS initiated a new series of conference with MRS Singapore as the organizer for the inaugural IUMRS – ICYRAM.

With the objective of recognizing the excellence, MRS Singapore instituted "IUMRS-MRS Singapore Young Researcher Award" given out during every ICYRAM conference. I am delighted to see that both IUMRS-ICYRAM conference series and the IUMRS-MRS Singapore Young Researcher Award are well received and patronized by the materials research community.

Other than organizing IUMRS conferences, MRS–Singapore organizes biennial "International Conference on Materials for Advanced Technologies (ICMAT)", the 10th edition of which attracted more than 3,000 delegates. It is a pleasure to see that IUMRS takes advantage of such large gatherings by introducing IUMRS at the opening ceremony of each of the ICMAT conferences at the invitation of MRS Singapore.

With the consent of IUMRS, MRS Singapore initiated organizing the "Trilateral Conference on Nanoscience: Energy, Water and Healthcare" together with its adhering bodies - Chinese MRS and MRS India. The very fact that it is going to the 10th edition speaks volumes about the encouragement provided by IUMRS in adhering bodies coming together, which obviously is one of the objectives of IUMRS.

MRS Singapore continues to serve IUMRS by being part of its Executive Committee. The Vice-President of MRS Singapore and the current Second Vice-President of IUMRS, Prof. Feng Yuan Ping, served as the Secretary of IUMRS before and I myself served as the Second Vice-President, First Vice–President and President of IUMRS at different times. In the same spirit, MRS Singapore is currently hosting the IUMRS Asia Regional Office and handling the financial operations of IUMRS Head Office currently located in China, in preparation for hosting IUMRS Head Office from 1 January 2021.

In support of IUMRS Asia Regional Office's mission to foster regional cooperation, MRS Singapore contributed significant funds to the two world-class Universities in Singapore, National University of Singapore and the Nanyang Technological University towards bringing the scientists of the Asian region to these Universities for collaborative research.

The world is no longer the same as it was 30 years back. Each Adhering Body of IUMRS gained substantial experience and credibility. Hence, there is a greater need for IUMRS leadership to make serious efforts to receive the continued support of the current adhering bodies. This will make sure of their continued association with IUMRS. Unless the adhering bodies see the absolute need to be part of the Union, there could be a risk of losing them. There is an equal need to motivate new members to join IUMRS. Competition and comparison with other International Unions of similar interest is growing. Despite the best efforts, IUMRS financial status is no way close to that of the most other Unions. I wish IUMRS leadership to take lead in finding alternate approaches to get financially sound and at the same time gain the active support of the adhering bodies.

I wish IUMRS another 30 successful years in the service of materials research community.

B.V.R. Chowdari
Nanyang Technological University, Singapore

◎ B.V.R. Chowdari, Chairman, International Conference on Materials for Advanced Technologies (ICMAT); Professor, National Technological University, Singapore.
https://www.physics.nus.edu.sg/~phychowd/
http://research.ntu.edu.sg/expertise/academicprofile/pages/StaffProfile.aspx?ST_EMAILID=CHOWDARI

4.13 MRS-Thailand

Materials Research Society of Thailand (MRS-Thailand)

By Prof. Dr. Santi Maensiri (President of MRSThailand (2016-present)

First of all, I would like to take this opportunity to congratulate IUMRS for reaching the milestone of 30 years. It is my great honor to provide the information about the Materials Research Society of Thailand (MRS-Thailand). The success story of MRS-Thailand could be partly attributed to its' strong association with IUMRS as an adhering body member.

4.13.1 History of MRS-Thailand

Prof. Dr. Santi Maensiri

The materials research society of Thailand (MRS-Thailand) was founded on March 2, 2016 as a result of the vision shared by almost 200 materials scientists in Thailand who gathered at National Science and Technology Development Agency on that day. It was agreed that Thailand needed a new not-for-profit interdisciplinary organization to serve as a community for collaboration to advance materials research for sustainable development of Thailand. Professor Dr. Santi Maensiri was voted to be the first president of the society. Since March 2016, our society had many activities to promote productive collaboration between members in all materials disciplines from member institutions and entities, public and private, both inside and outside Thailand. On August 27, 2017, MRS Thailand Executives led by Professor Dr. Santi Maensiri attended the International Union of Materials Research Societies General Assembly meeting in Kyoto, Japan. At the meeting, the MRS Thailand was approved to be a member of IUMRS. And the society was officially approved to be one of the not-for-profit interdisciplinary organization societies in Thailand on December 6, 2017. So far, the society has grown to have 870 members of which 30 members serve on the committee for the society.

4.13.2 Headquarters office

National Science and Technology Development Agency (Yothee Office), 73/1, Rama 6 Road, Payathai, Ratchathewi, Bangkok, 10400, Thailand

Email: thailandmrs@gmail.com

Website: http://www.mrsthailand.or.th/

Facebook: www.facebook.com/MRSThailand

4.13.3 Mission:

The MRS-Thailand strives to

1. Enhance capacity building foryoung and early career scientists by implementing capacity building activities.
2. Promote productive collaboration between members in all disciplines from member institutions and entities, public and private,both inside and outside the country
3. Promote the advancement in materials research to increase competitiveness of Thailand

4.13.4 The objectives of MRS-Thailand are as follows

1. To support the development across all fields of materials science, including materials engineering and innovative materials.
2. To be a hub for providing technical training and the dissemination of knowledge in materials science, materials engineering and innovation.
3. To promote an active cooperation between member institutions and entities (public and private), both inside and outside of Thailand.
4. To respect and glorify scientific researchers, engineers and innovators working in the fields

of materials science and innovative materials.

5. To work in partnership with charities and nonprofit organizations, and facilitate collaborations for public benefit service provision.

4.13.5 MRS-Thailand as a member of IUMRS

On August 27, 2017, MRS Thailand Executives led by Professor Santi Maensiri attended the International Union of Materials Research Societies General Assembly meeting in Kyoto, Japan. At the meeting, the MRS Thailand was approved to be a member of IUMRS.

Picture 1: IUMRS General Assembly meeting, August 27- September 1, 2017, Kyoto, Japan

4.13.6 Conferences hosted by MRS-Thailand:

1. The First Materials Research Society of Thailand International Conference (1st MRS Thailand International Conference), Convention Center, The Empress Hotel, Chiang Mai, Thailand. October 31 - November 3, 2017.

Picture 2: The First Materials Research Society of Thailand International Conference at the Convention Center, The Empress Hotel, Chiang Mai, Thailand, October 31- November 3, 2017

The conference was organized by MRS-Thailand and Chiang Mai University, together with academic agencies, public and private organizations. Itwas our first official international conference having about 1,200 participants attending the conference. The main purpose of this conference was to exchange knowledge, new ideas and innovative technologies from researchers with the expertise in materials science both domestically and internationally. With contribution from hundreds of volunteers, we managed to organize 20 symposia covering all materials research fields including Emerging Solar PV, Energy Storage Materials, Graphene and Carbon Materials, Thermoelectrics, Dielectrics, Piezoelectrics, Ferroelectrics, Superconductors and Energy Harvesting Materials, Magnetic Materials and Their Applications, Materials Joining and Additive Manufacturing Technology, Ceramic and Glass Technology, Polymer, Rubber, Plastics and Bioplastics, Biomaterials and Applications, Sensors, Organic Electronics and Printed Electronics, Metal, Material Pro-

cessing and Corrosion, Composites and Construction Materials, Computational Material Sciences, Surface Sciences, Tribology and Thin Film Technology, Catalyst and Materials Chemistry for Green Environment, Instrumentation and Material Characterization, Synchrotron Radiation and Applications on Material Sciences, Material Education in 21st Century, and Material Enterprises and Industries.

2.The 2nd Materials Research Society of Thailand International Conference (MRS-Thailand 2019), The Zign Hotel, Pattaya, Thailand, July 10 - 12, 2019.

Picture 3: The 2nd Materials Research Society of Thailand International Conference (MRS-Thailand 2019) at the Zign Hotel, Pattaya, Thailand, July 10 - 12, 2019

The MRS-Thailand 2019 included plenary sessions with 6famous scientists and 20 keynote lectures on specific fields. The conference aimed to provide platform for the sharing of knowledge and experience of materials scientists from within and outside the country. Seventeen symposia were organized including Emerging Solar PV, Energy Storage Materials and Energy Harvesting Materials, Graphene and Carbon Materials, Dielectrics, Piezoelectrics, Ferroelectrics, Thermoelectrics and Superconductors, Magnetic Materials and Their Applications, Materials in Design Manufacturing and Applications, Ceramic and Glass Technology, Polymers/Rubber/ Bioplastics/colloid and emulsion, Biomaterials and Applications, Sensors, Organic Electronics and Printed Electronics, Composites and Construction Materials, Computational Material Sciences, Surface Sciences, Tribology and Thin Film Technology, Catalyst and Materials Chemistry for Green Environment, Instrumentation and Advanced Material Characterization, Material Enterprises and Industries, Rheology, and Quantum Materials and Technologies. Nearly 700 participants attended the conference.

Within, International Conference of Materials Research Society of Thailand views as a very important to the country. Thailand needs to rely on technology in materials science, which is one of the four branches of technology that has been identified as a core technology for long-term national development in the next 20 years. Advances in materials science are crucial for supporting Thailand 4.0 model which focuses onseven new industry areas including robotics, aviation, logistics, biofuels, biochemical, digital and medical industry. They aimed to serve as the new growth engines for Thailand.

The Materials Research Society of Thailand recognized that the success in science comes through collaboration. And it is time to organize conferences to serve as platform for initiation of new collaborations and strengthening the existing ones, which are the 21st International Union of Materials Research Society – International Conference in Asia 2020 (IUMRS-2020), to be held on February 23– 26, 2021 at the Convention Center, The Empress Hotel, Chiang Mai, Thailand and The 12th Asian Meeting on Ferroelectricity- The 12th Asian Meeting on Electroceramics (AMF-AMEC 2021) to be held on July 6 - 9, 2021, Pattaya, Thailand.

Picture 4: Posters of The 21st International Union of Materials Research Societies – International Conference in Asia 2020 (IUMRS-ICA 2020) to be held on February 23 – 26, 2021 at the Convention Center, The Empress Hotel, Chiang Mai, Thailand

Picture 5: Poster of The 12th Asian Meeting on Ferroelectricity-Asian Meeting on Electroceramics (AMF-AMEC 2021) to be held on July 6 - 9, 2021, Pattaya, Thailand

Moreover, the Materials Research Society of Thailand has planned to create a scientific journal under the name-Science and Innovation of Advanced Materials (SIAM), with Prof. Dr. Santi Maensiri as an editor in chief. The first volume will be published in 2021.

4.13.7 Participations of activities

MRS-Thailand joined the activities and conferences both in Thailand and abroad to create a networkand made MRS-Thailand well known.

Domestic activities participation of MRS-Thailand

1. MRS-Thailand co-hosted the 9th International Conference on Materials Science and Technology (MSAT-9), December, 14-15, 2016 at Swissotel Le Concord, Bangkok, Thailand and we also had The 1st Annual meeting of MRS-Thailand, on December 14, 2016.

(a) (b)

Pictures 7: MRS-Thailand co-hosted(a) theInternational Conference on Materials Science and Technology(M-SAT-9)and (b) MRS-Thailand 1st Annual meeting, December 14-15, 2016, Swissotel Le Concord,Bangkok, Thailand

2. MRS-Thailand co-hosted the 10th International Conference on Materials Science and Technology (MSAT-10), September 6-7, 2017 at Bangkok International Trade & Exhibition Centre: BITEC, Bangkok, Thailand and we also had The 2nd Annual meeting of MRS-Thailand, on September 6, 2018

Picture 8: MRS-Thailand co-hosted the International Conference on Materials Science and Technology (MSAT-10) and MRS-Thailand 2nd Annual meeting, September 6 - 7, 2017, BITEC, Bangkok, Thailand

Participations of oversea activities

1. MRS-Thailand committees joined the International Union of Materials Research Societies International Conference in Asia (IUMRS-ICA 2016), October 20-24, 2016, Rizhao, Shandong, China

Picture 10 & 11: attended 17th IUMRS International Conference in Asia (IUMRS-ICA 2016), Shandong, China

2. MRS-Thailand Committee members observed the International Union of Materials Research Societies (IUMRS) Executive Council meeting and the 2016 IUMRS General Assembly, July 3 - 4, 2016, Singapore

Picture 9: Committee members of MRS-Thailand observed the IUMRS General Assembly, 2016, Singapore

3. MRS-Thailand committees joined the International Union of Materials Research Societies General Assembly, August 27 - September 1, 2017, Kyoto, Japan. MRS-Thailand was certified as a member of IUMRS.

Picture 10: MRS-Thailand committee members attended the IUMRS General Assembly, Kyoto, Japan.

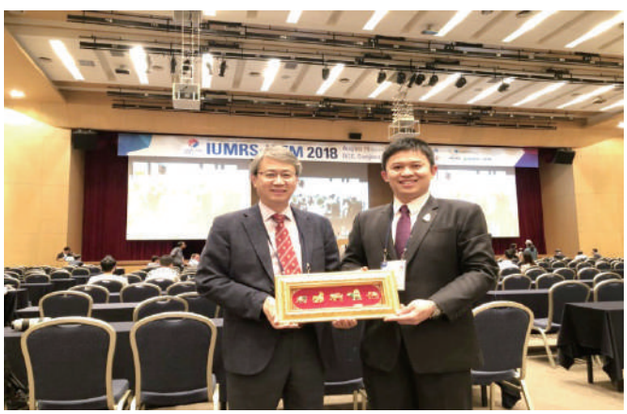
4. MRS -Thailand president attended the 1st Materials Research Society of Indonesia Conference, October 8-12, 2017, Yogyakata, Indonesia

Picture 11: MRS-Thailand president attended the MRS-INA Conference and Congress 2017

5. MRS -Thailand president attendedthe International Union of Materials Research Societies International Conference in Asia (IUMRS-ICA), November 5 -7, 2017, Taipei, Taiwan

Pictures12: MRS-Thailand president attended IUMRS-ICA 2017, Taipei, Taiwan

6. MRS Thailand president attended International Union of Materials Research Societies International Conference on Electronic Materials 2018 (IUMRS-ICEM), Daejeon, Korea



Pictures13: MRS-Thailand president attended the IUMRS General Assembly (IUMRS-ICEM 2018)

4.14 MRS-Taiwan

Statement about MRS-T

Dr. Alex YM Peng

The current president of MRS-T is Dr. Alex YM Peng, who is also the vice president of Industry Technology Research Institute. The term for the MRS-T presidency is two years, and it can be re-elected once.

The Materials Research Society-Taiwan (MRS-T) was founded with the official name of "The Chinese Society for Materials Science (CSMS)" by Chih-Houng Lu of National Taiwan University, James C. M. Li (then at Edgar C. Bain Laboratory and later moved to University of Rochester), and some other mechanical and metallurgical pioneer engineering people in September, 1968. Prof. Lu, who was educated and trained as a metallurgist in Japan and served as the president of National Taiwan University during August 1946 to April 1948, was elected as the first president of the society. The Chinese name of CSMS has been used domestically since it was founded. However, as a founding adhering body of IUMRS, the name of "MRS-T" was adopted to participate in international activities in order to differentiate from C-MRS. It was not until 2008 that the official English name of CSMS was changed to MRS-T to avoid confusion.

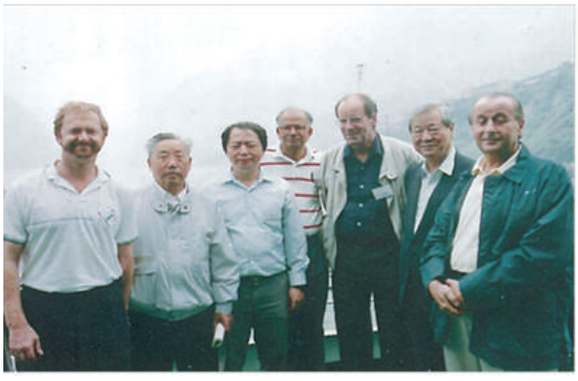
Since there has been a fast growth and expansion of high-tech industries, such as IC, IT, TFT-LCD, LED, solar cells, etc. in Taiwan since the 1980s, there is a high demand of manpower in materials science (MS). This leads to expansion of MS programs in the universities. In addition to materials science and engineering departments, most traditional chemical engineering departments have been recently transformed to chemical engineering and materials science departments to train students with materials science knowledge. This makes the number of MS-related departments increasing to more than 50 in Taiwan, probably the highest density in the world. Currently, MRS-T has more than 1700 individual members and nearly 100 group members. It has served as a platform to link industry, academia, and government together to promote the R&D of materials science in Taiwan. Since it was founded, MRS-T organizes an annual meeting every year. For example, MRS-T commemorated its 50th anniversary in 2018. More than 1000 papers (poster and oral) were presented, and more than 1200 people participated in the meeting.

In addition to publishing professional books, magazines, journals, and web-based courses related to materials science, MRS-T has also been publishing an international journal "Materials Chemistry and Physics (MCP)" in cooperation with Elsevier since July, 1992. The wide distribution and high impact of MCP can be appreciated by the growth of impact factor from 0.78 in 2000 to 2.781 in 2018 and over 4000 submissions in the year of 2018. MRS-T has been closely working with IUMRS to promote international materials R&D activities. For instance,MRS-T has hosted ICA-1994, ICEM-1994 & ICEM-2014 and ICA-2004 & ICA-2011 & ICA-2017. It also plans to organize ICAM and ICEM in the near future.

Picture 1 The first general meeting of MRS-T in 1968.

Picture 2 Founder and first president of MRS-T, Prof. Chih-Houng Lu.

Picture 3 K. T. Li, Taiwan's architect of modern economic development and high-tech industries, received Lu Chih-Houng Memorial Award of MRS-T in 1990



Picture 4 Presidents of adhering members of IUMRS attending the first IUMRS-ICA held in a boat crusing along the Yangtze River in 1993

Picture 5 The second IUMRS-ICA hosted by MRS-T in Hsinchu, Taiwan, 1994

Picture 6 The IUMRS-ICEM-1994 hosted by MRS-T in Hsinchu, Taiwan

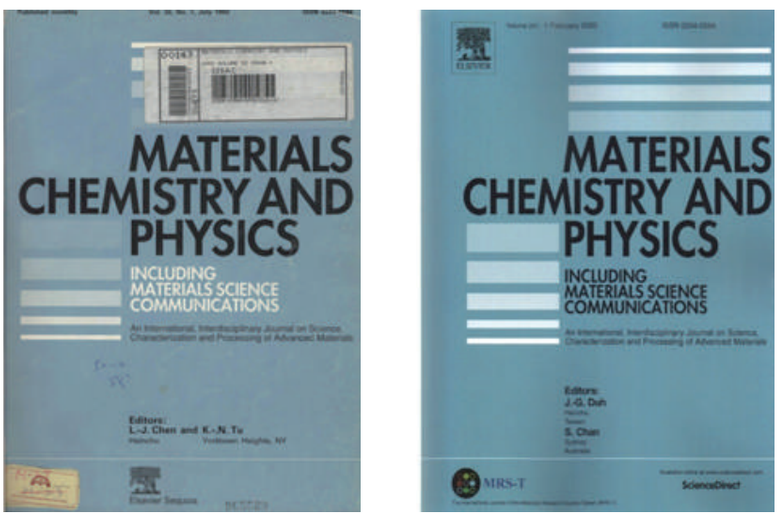
Picture 7 Opening ceremony of the IUMRS-ICA-2004 in Hsinchu, Taiwan

Picture 8: IUMRS ICA 2011 held in Taipei, Taiwan. Discussion (left) and delegates meeting (right).

Picture 9: IUMRSICEM 2014 held in Taipei, Taiwan. Open ceremony (left) and GA delegates group photo (right).

Picture 10: IUMRS ICA 2017 held in Taipei, Taiwan.Plenary lecture (left) and young scholars awards ceremony (right).

Picture 11: The 50th anniversary ceremony of MTS-T in 2018. Past presidents of MRS-T forum after the open ceremony (left) and member delegates group photo (right).



Picture 12: The MCPjournal published jointly by MRS-T and Elsevier. The first issue published in July 1992 edited by L.-J. Chen and K.N. Tu (left). The recent issue published and edited by J.G. Duh and S. Chan (right).

Chapter 5 IUMRS Conferences

5.1 Introduction to IUMRS Series Conferences

The academic exchange between the materials scientists in the world is one of the most important activities of IUMRS. Five IUMRS conferences/forums have been established during the last 30 years by IUMRS forerunners and successors. IUMRS Series Conferences include 1. IUMRS-ICAMs (International Conferences on Advanced Materials); 2. IUMRS-ICEMs (International Conferences on Electronic Materials); 3. IUMRS-ICAs (International Conferences in Asia); 4. IUMRS- World Materials Summit (WMS) and 5. IUMRS-ICYRAMs (International Conferences for Young Researchers on Advanced Materials).

Both IUMRS-ICAMs and IUMRS-ICEMs started in 1988 and were held in Japan mainly organized by MRS-Japan. Later on, these two conferences are held every two years (odd number year for IUMRS-ICAMs and even number year for IUMRS-ICEMs). Every IUMRS adhering body can apply to hold the conferences, and the conference organizing society will be decided by the voting of IUMRS adhering bodies. The formal IUMRS EC(executive members) meetings and GA (general assembly) meeting are held during these two conferences. The hosting society should provide the place and certain financial support for the EC and GA meetings.

IUMRS-ICA initiated at 1993, and the first conference was held in China, Sept. 1993 organized by C-MRS. Later on IUMRS-ICAs were held every year organized MRS-Taiwan, MRS-Korea, MRS-Japan and MRS-India, taking term by Asia members till 1998. After 2000 the conferences were held every two years for the second term, and the new members MRS-Singapore joined the second term. The third term and starting from 2010 returned to the role of one a year. The new members MRS-Indonesia, MRS-Australia and MRS-Thailand joined the third term.

IUMRS- WMS(World Materials Summit) started in 2007 and held every two years. The first summit was held in Lisbon, Portugal, Oct. 2007 organized by E-MRS, followed by second one in Suzhou, China, Oct. 2009 (C-MRS), third one in Washington DC, USA, Oct. 2011(MRS), fourth one in Strasburg, France, Oct. 2013(E-MRS), fifth one in Rizhao, Shandong, China, Oct. 2016 (C-MRS), sixth one in Strasburg, France, Oct. 2017(E-MRS) and eighth one in Hongzhou, China, Oct. 2019 (C-MRS).

IUMRS-ICYRAMs initiated at 2011 in the GA meeting in Nice. The aim of this new conference is to provide a platform for the young materials researchers in the world to exchange their recent research achievements as well as to strengthen the cooperation among young materials in the different countries and areas. The main organizers of the conference should be under the age of 40. The first conference (organized by MRS-Singapore) was held in Singapore, in July, 2012, followed by second one(by C-MRS) in Haikou, Hainan, China, Oct. 2014. Third (by MRS-India) and fourth (by Australia-MRS) ones were held in Bangalore, India, Oct.. 2016, and Adelaide, Australia, Sept. 2018. Due to the COVID-19 the fifth meeting (by E-MRS, in Warsaw, Poland, Sept. 2020) was postponed to 2022.

5.2 List of IUMRS-ICAMs (International Conferences on Advanced Materials)

	Time	Place	Hosting Society	Number of Symposia	Scale	Country/areas of Participants From
1	1988	Tokyo, Japan	MRS-Japan	21	1665	24
2	1991	USA	MRS-USA			
3	1993	Tokyo, Japan	MRS-Japan	37	2200	
4	1995	Cancun, Mexico	MRS-Mexico	35	1000	
5	June14-18, 1999	Beijing, China	C-MRS	36	2000	45
6	2001	Cancun, Mexico	MRS-Mexico			
7	2003	Yokohama, Japan	MRS-Japan	39	2100	34
8	2005	Singapore	MRS-Singapore	25	2000	
9	2007	Bangalore, India	MRS-India	24		
10	2009	Rio, Brazil	MRS- Brazil			
11	May 2011	Nice, France	E-MRS		3000	
12	Sept.22-28, 2013	Qingdao, China	C-MRS	33	2500	34
13	2015	Jeju, Korea	MRS-Korea	38	1527	38
14	2017	Kyoto, Japan	MRS-Japan	30	1878	44
15	May, 2019	Nice, France	E-MRS	28+5	3500	
15	2021	Cancun, Mexico	MRS-Mexico			

5.3 List of IUMRS-ICEMs(International Conferences on Electronic Materials)

	Time	Place	Hosting Society	Number of Symposia	Scale	Country/areas of Participants From
1	1988	Japan	MRS-Japan			
2	1990	Francisco, USA	MRS			
3	1992	Strasbourg, France	E-MRS			
4	1994	Hsinchu, Taiwan	MRS-Taiwan	8	520	29
5	1996	USA	MRS			
6	1998	Jeju, Korea	MRS-Korea	9	443	20
7	2000	Strasbourg, France	E-MRS			
8	June14-18, 2002	Xi'an, China	C-MRS	14	800	28
9	2004	San Francisco,USA	MRS			
10	2006	Nice, France	E-MRS			
11	2008	Sydney, Australia	A-MRS	19+2	1000	
12	2010	Seoul, Korea	MRS-Korea	22	1077	22
13	2012	Yokohama, Japan	MRS-Japan	39	1811	35

	Time	Place	Hosting Society	Number of Symposia	Scale	Country/areas of Participants From
14	2014	Taipei, Taiwan	MRS-Taiwan			
15	2016	Singapore	MRS-Singapore			
15	2018	Taejon, Korea	MRS-Korea	29	1163	36
16	2020	Iguassu Falls, Brazil	MRS-Brazil (postponed to 2021 duo to COVID-19)			

5.4 List of IUMRS-ICAs (International Conferences in Asia)

	Time	Place	Hosting Society	Number of Symp	Scale
1	Sept. 1993	Yangtze River, China	C-MRS		180
2	1994	Hsinchu, Taiwan	MRS-Taiwan	5	271
3	1995	Seoul, Korea	MRS-Korea		
4	1997	Makuhari, Japan	MRS-Japan	22	1280
5	1998	Bangalore, India	MRS-India		
6	July 24-26, 2000	Hongkong	C-MRS		700
7	2003	Singapore	MRS-Singapore		
8	2004	Hsinchu, Taiwan	MRS-Taiwan		
9	2006	Jeju, Korea	MRS-Korea	17	1306
10	2008	Nagoya, Japan	MRS-Japan	38	1754
11	2009	Singapore	MRS-Singapore		
12	Sept. 25-28, 2010	Qingdao, China	C-MRS	17	1800
13	2011	Taipei	MRS-Taiwan		
14	2012	Busan□Korea	MRS-Korea	21	1603
15	2013	Bangalore, India	MRS-India		
15	2014	Fukuoka, Japan	MRS-Japan	50	1933
16	2015	Singapore	MRS-Singapore		
17	Oct.20-24 2016	Qingdao, China	C-MRS	28	2500
18	2017	Taipei	MRS-Taiwan		
19	2018	Bali, Indonesia	MRS- Indonesia	27	
20	2019	Perth, Australia	MRS-Australia	38	500
21	2020	Thailand	MRS-Thailand		
22	2021	Korea	MRS-Korea		

5.5 IUMRS-ICYRAMs (International Conferences for Young Researchers on Advanced Materials)

5.5.1 List of IUMRS-ICYRAMs

	Time	Place	Hosting Society	Number of Symposia	Scale
1	2012	Singapore	MRS-Singapore		800
2	2014	Haikou, China	C-MRS	15	1400
3	2016	Bangalore, India	MRS-India		1000
4	2018	Adelaide, Australia	MRS-Australia		300

5.5.2 Photo Collection of IUMRS-ICYRAMs

First IUMRS- ICYRAMs in Singapore, July 2012

Prof Tan Chorh Chuan, President of National University of Singapore and Prof B.V.R. Chowdari at the Opening Ceremony of IUMRS-ICYRAM on July 2, 2012

Prof Barry Halliwell, Deputy President of National University of Singapore awarded a medal of Young Research Awards for Prof Xiangfeng Duan at the Award Ceremony of IUMRS-ICYRAM on July 6, 2012

Second IUMRS- ICYRAMs in Haikou, Oct. 2014

Opening Ceremony and plenary session of IUMRS- ICYRAMs in Haikou, Oct. 25, 2014

President Prof. Osamu Takai and Prof. B.V.R. Chowdari awarded a medal of Young Research Awards for Prof. Ali Khademhosseini at the Second IUMRS-ICYRAMs in Haikou, Oct. 26, 2014

Excellent poster award winners of IUMRS- ICYRAMs, in Haikou, Oct. 26, 2014

Registration Desk of IUMRS- ICYRAMs in Haikou, Oct. 24-27, 2014


Parallel sessions of IUMRS- ICYRAMs in Haikou, Oct. 25-27, 2014

5.6 IUMRS- World Materials Summit (WMS)

5.6.1 List of IUMRS- (WMS)

	Time	Place	Theme	Hosting Society	Scale
1	Oct. 2007	Lisbon, Portugal	Materials and Sustainable Development	E-MRS	80
2	Oct. 2009	Suzhou, China	Renewable Energy Materials	C-MRS	130
3	Oct. 2011	Washington DC, USA	Materials for Energy and Environment Young Scholars Forum	MRS-USA	150
4	Oct. 2013	Strasbourg, France	Materials for Energy and Environment Young Scholars Forum	E-MRS	150
5	Oct. 2016	Rizhao, China	Materials for Energy and Environment	C-MRS	80
6	Nov. 2017	Strasbourg, France	New Frontier Material Young Scholars Forum	E-MRS	150
7	Oct. 2019	Hangzhou, China	New Frontier Material & the past and future of IUMRS	C-MRS	100

5.6.2 General information of IUMRS-World Materials Summits

The first world Materials Summit was held in 2007 in Lisbon, Portugal during the 6-month Portuguese Presidency of the European Union. In the preceding years there had been informal discussion between representatives of the adhering bodies during IUMRS meetings regarding the possibility of organizing conferences on the future energy supply on raw material, and critical materials supply, but no action was forthcoming. However, E-MRS considered that there was a real need to focus on the various current challenges facing the world for which there was currently no forum to facilitate discussion and proposing action so they took a double initiative:

-E-MRS launched an equivalent structure as IUMRS, but limited to European based learned societies acting in the field of materials at the European level with the title European Materials Forum (EMF). This title was officially deposited at the French National Institute of Industrial Property (INPI) on August 28th, 2007 (ref. 073521411)

The title World Materials Summit was deposited at INPI by E-MRS on August 28th, 2007 (ref. 073521412)

The concept, development, organization and implementation of the inaugural and highly successful inaugural World Materials Summit was entirely through the initiative of the European Materials Research Society, E-MRS, using the newly legalized EMF and under the umbrella of the European Commission. E-MRS also financed the event

without any external support. The Summit was opened by one of the three Presidents of EMF, Michal Kleiber, the former Polish Minister of Science and Scientific advisor to the President of Poland. The Summit was intended to be the means to bring together, by invitation only, experts and world leaders from academia, industry, together with the political decision makers involved in the key issues facing the world for which materials developments are essential to find sustainable solutions. Lisbon was selected as the venue because The Portuguese Commissioner of the European Union had responsibility for research and had announced enhanced funding for research and the Summit became one of the high profile events of the Portuguese EU Presidency.

Although the Summit was an EMF/E-MRS event invitation was sent to MRS, MRS-C and IUMRS representatives who all attended. It was hoped that the adhering bodies to the Society and the materials community at large may benefit from the initiative and any subsequent publicity. During discussions between the three societies, E-MRS, MRS and MRS-C during the Summit and the perceived evidence of its success it was agreed that future Summits would be held as a tri-partite initiative and that MRS-C would host second Summit in 2009 and that MRS, then still a member of IUMRS would host the third in 2011. However, it was also agreed that IUMRS will be a permanent invited guest.

Following the Summit in Lisbon the European Science Foundation offered to produce the report of the Summit. As already indicated above, at that time E-MRS was attempting to bring the various European Societies together to create a "materials community" single voice for influencing the policy and decision makers of the European Commission, through the European Materials Forum, EMF. The initiative was closely followed by the European Union, especially the Portuguese European Commissioner.

The Second Summit organized and hosted by MRS-C was held in Suzhou, China focusing on Advanced Materials in Energy Applications and Sustainable Society, October 12-15, 2009, Suzhou, China and collected scientific and technical reports and made recommendations on how to best achieve the essential acceleration of development by the worldwide materials science and technology community.

As agreed in 2007 the third summit was organized by MRS from October 9-12, 2011 in Washington, DC. This event introduced a student congress involving young researchers from around the world both to learn from the speakers at the Summit and to express their views on how they see the future.

The 2013 Summit organized by E-MRS was held in Strasbourg from October 12th -15th and focused on Key Enabling Technology for Secure Energy & Sustainable Development. Following on from the highly successful Student Congress in Washington the Summit included a Forum for Next Generation Researchers which proved to be equally as successful as its predecessor in Washington.

The responsibility for organizing Summit number five returned to MRS-C and was held at Rizhao from 18th-20th October 2016 on Advanced Materials for Sustainable Society Development. As with all the Summits it was supported by speakers from IUMRS adhering bodies, but for various reasons could not incorporate the forum for worldwide young researchers.

As MRS had withdrawn from IUMRS and had declared that they could see no advantage in hosting and organizing of the Summit E-MRS organized the 6th Summit at the Council of Europe on 20th-21st November 2017 preceded by a two-day forum for the next generation of young researchers consisting of people selected by the various adhering bodies of IUMRS. The Summit addressed topics related to Materials Innovation for the Global Circular Economy and Sustainable Society.

The next Summit is being organized by MRS-C in Hangzhou from October 24-26th 2019. Twelve years after the inaugural summit the challenges are even more clear recognized and today include climate change, energy supply and storage, water, transportation, health and nutrition, recycling and natural resources. The need for the Summits to address these problems and urge the world's policy and decision makers to participate and then take real initiatives to address the issues is essential for the sustainability of human life worldwide.

Therefore, it is an essential task for our scientific community to develop and enhance the concept of the Summit so that it becomes a recognized and influential voice throughout the world.

5.6.3 Introduction to Second World Materials Summit

The concept of IUMRS World Materials Summits initiated in 2005. Professor Lian Zhou, the president of C-MRS and IUMRS at that time, lead several discussions during some informal IUMRS meetings in Beijing, Xian, Ningbo and Shanghai with the various IUMRS member societies about the future possible developments of the International Union of Materials Research Societies. During one evening boat tour on a lake close to Shanghai in 2005 the suggestion emerged of organizing conferences on the role of materials for future energy supply. Although Professor Zhou could not bring this concept to fruition, recognition of the strategic importance of materials for the future energy worldwide supply led to E-MRS deciding to begin the organization of the First World Materials Summit for Energy, with the support of the newly elected President of IUMRS, Professor Gabriel Crean. The inaugural summit was held in Lisbon, Portugal, 4-5th October 2007, coinciding with the Portuguese Presidency of the European Union.

The Second World Materials summit was held in the Shilla Hotel, Suzhou Industrial Park, Suzhou, Jiangsu province, Oct. 12-15, 2009 and sponsored and organized by C-MRS, E-MRS, MRS and IUMRS, and the Chair of the summit was Prof. Kuangdi XU, Academician and President of CAE, and Co-Chairs were Prof. Boyun Huang (Academician of CAE, and President of C-MRS) and Paul Siffert (Past president of IUMRS and E-MRS) .

The theme for the summit was "Advanced Energy Materials and Sustainable Development of Society". The current industrial status, recent research achievements, and government policies in the field of advanced materials for energy application were presented. The main technical topics included, but not limited to, the six topics of Solar energy and photovoltaic cell materials, Nuclear energy materials, Hydrogen energy related materials and fuel cells, Large scale energy storage and battery materials, the materials for bio-energy, and Alternate energy sources and transmission.

130 top scientists, entrepreneurs and government officers from 18 countries and regions attended the Summit, 51 from C-MRS, 28 from MRS, 22 from E-MRS, 9 from MRS-J, and 11 from MRS-T. The *Suzhou Declaration* was issued and published. The meeting concluded with the following findings:

"To meet the needs of sustainable development of society, new and multiple energy supplies with high-efficiency and low carbon emission are needed. However, the current technologies of renewable energy are not competitive in cost or performance. Advanced energy materials have already demonstrated a significant contribution to energy development and will play a fundamental role in further raising energy generation efficiency and reducing the costs of energy generation systems.

Compared to the urgency of energy and environmental problems, the present pace of research and development of advanced materials is too slow. Fragmented and duplicated research in the energy materials' community inhibits its development. Innovation of advanced energy materials and a breakthrough in its effective integration into energy systems is essential to meet the needs of highly efficient and clean applications of energy production.

In order to integrate the research community and accelerate the rate of development of advanced energy materials, international collaboration is particularly crucial in the pre-competitive technology of advanced energy materials when focused on research, development, and demonstration of renewable energy. The following areas are recommended as collaborative areas of research and development:

Materials for nuclear reactors

Materials for thin film solar cells and solar thermal generators

Materials for hydrogen-energy and fuel cells

Materials for large-scale energy-storage technology

Materials for biomass energy

Regulations, codes and standards for novel energy materials

To ensure that international collaboration is effective and efficient, the financing of collaborative research and development projects and their working principles should be established under the road-map and coherent framework of the International Union of Materials Research Societies (IUMRS).

Group photo of 2nd IUMRS-World Materials Summit in Suzhou, Oct.2009

Opening Ceremony of 2nd IUMRS-World Materials Summit inSuzhou,Oct.13, 2009

Att. Suzhou 2009 Declaration on Enhancing Development of Advanced Energy Materials

From October 12 to October 15, 2009 the Chinese Materials Research Society (C-MRS) hosted the "Second World Materials Summit" in Suzhou, Jiangsu Province, China, on the topic of "Advanced Energy Materials and Sustainable Society Development." More than one hundred distinguished scientists, government officials, and business leaders from all over the world came together to evaluate the current status of research and its application to advanced energy materials, to outline key issues and challenges in the development of advanced energy materials, envision their potential role in the development of nuclear and renewable energy, and discuss the paths to enhance the development of advanced energy materials.

The meeting concluded with the following findings:

1. To meet the needs of sustainable development of society, new and multiple energy supplies with high-efficiency and low carbon emission are needed. However, the current technologies of renewable energy are not competitive in cost or performance. Advanced energy materials have already demonstrated a significant contribution to energy development and will play a fundamental role in further raising energy generation efficiency and reducing the costs of energy generation systems.
2. Compared to the urgency of energy and environmental problems, the present pace of research and development of advanced materials is too slow. Fragmented and duplicated research in the energy materials' community inhibits its development. Innovation of advanced energy materials and a breakthrough in its effective integration into energy systems is essential to meet the needs of highly efficient and clean applications of energy production.
3. In order to integrate the research community and accelerate the rate of development of advanced energy materials, international collaboration is particularly crucial in the pre-competitive technology of advanced energy materials when focused on research, development, and demonstration of renewable energy.The following areas are recommended as collaborative areas of research and development:

- Materials for nuclear reactors
- Materials for thin film solar cells and solar thermal generators
- Materials for hydrogen-energy and fuel cells
- Materials for large-scale energy-storage technology
- Materials for biomass energy
- Regulations, codes and standards for novel energy materials

4. To ensure that international collaboration is effective and efficient, the financing of collaborative research and development projects and their working principles should be established under the road-map and coherent framework of the International Union of Materials Research Societies (IUMRS).

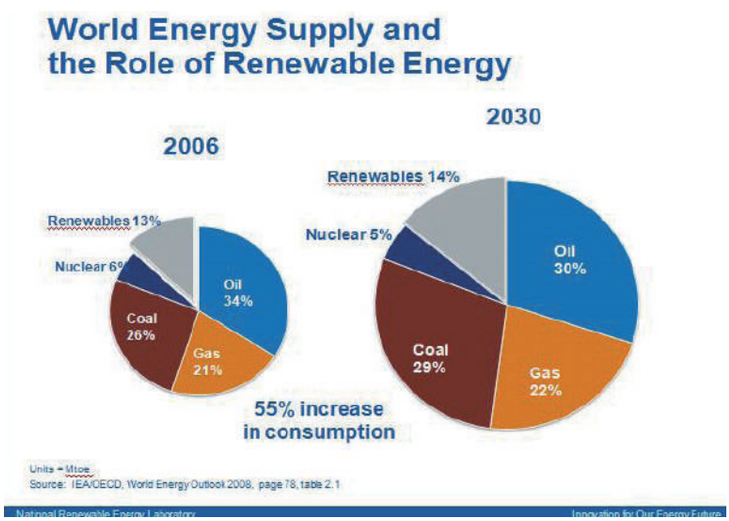
This declaration is drafted on the basis of the summary of the "Second World Materials Summit". It captures

the comments and ideas that participants exchanged and summarizes the major themes that participants expressed throughout the summit. This summit was divided into five sessions, including: Solar Energy and Photovoltaic-Cell Materials, Nuclear Energy Materials, Hydrogen Energy-related Materials and Fuel Cells, Materials for Large-scale Energy-storage Technology, Materials for Biomass-energy, and Other Energy Materials. The summaries of these sessions are attached in the appendices.

5.6.4 Third World Materials Summit for Energy: a cooperative project among Materials Research Societies

After two World Materials Summits for Energy, the third one is already planned to be organized in Washington D.C. (USA) in 2011. This initiative, a cooperative project between Europe-MRS (E-MRS), China-MRS (C-MRS) and MRS, and with the support of International Union of Materials Research Societies (IUMRS), was born on an evening boat tour on a lake close to Suzhou (China) in 2005. Professor Lian Zhou, president at that time of IUMRS, leaded several discussions during some meetings in Ningbo and Shanghai with the various members societies about the future possible developments of the Internationals Materials Community. That evening on that boat it emerged the suggestion of organizing conferences on the role of materials for future energy supply. Although Professor Zhou could not bring this concept to fruition, recognition of the strategic importance of materials for the future energy worldwide supply, led to E-MRS deciding to begin the organization of the First World Materials Summit for Energy, with the support of the newly elected President of IUMRS, Professor Gabriel Crean. The inaugural summit was held in Lisbon (Portugal) on 4-5th October 2007, coinciding with the Portuguese Presidency of the European Union.

The World Materials Summit for Energy was not conceived as another conventional scientific conference, but as an event to bring together about 100 invited selected word wide leaders in science, technology and policy, representing industry, university and government, to formulate an objective view on the world's economically viable possibilities to reduce CO_2 emissions during energy production and use, by means of new and innovative materials and processes, including solar energy, wind power, biofuels, hydrogen fuel cells, and nuclear fission and fusion. Current projections estimate that the energy needs of the world will more than double by the year 2050, some demands that cannot be met by existing technologies. In this context, advanced materials, materials research and innovation are probably the most important elements to develop the required new technologies needed for this purpose.

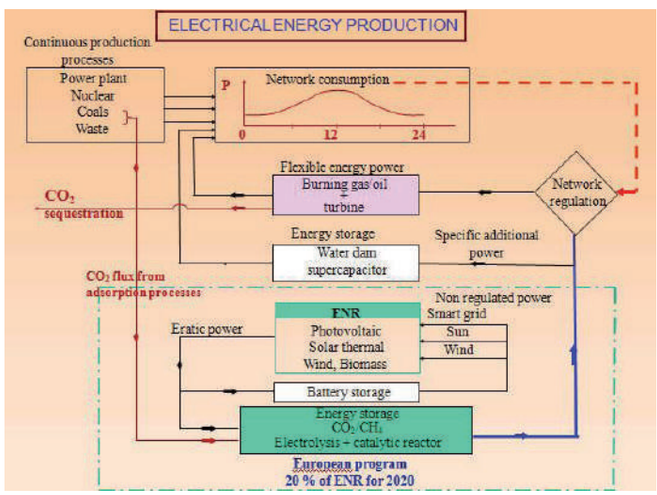


International Energy Agency (IEA) projects for energy from 2006 to 2030 (Courtesy of Dr. D.E. Arvizu from the National Renewable Energy Laboratoy, Golden, Colorado, USA).

At the end of the First Summit, the most important aspects identified were published as the Lisbon 2007 Declaration on International Cooperation in Materials Research: Key to Meeting Energy Needs and Addressing Climate

Change. The meeting concluded that the present pace of research and development was too slow to meet the needs of world's rapidly growing and increasingly energy-hungry population. Effort was too fragmented, and competition between different laboratories and institutions hindered progress on complex problems where international cooperation was vital to achieve breakthroughs. It was recognized that each of the technologies discussed required new and improved materials to increase efficiency and reliability, decrease greenhouse gas emissions, reduce capital costs, and extend operating lifetimes. The conclusions were sometimes in conflict with the views expressed by the voices of main media, since it was recognized that energy coming from fossil fuels will continue to dominate for the next decades, or that hydrogen fuelled cars are far from readiness for the mass market at economically valid conditions, and that electric cars will be limited for a long time to small niche markets as Li-battery stability has to be proven and its availability in sufficient quantities to meet the demand is a major concern. It was established that only solar, further controlled use of nuclear and, at long term bio-energy are eligible for low CO_2 emissions.

The very positive output from the first Summit immediately led to the suggestions for continuing the initiative that was decided to take place in China, in Suzhou were all this idea began. The Second World Materials Summit for Energy was organized by C-MTS and The Chinese Academy of Technology on 12-15th October 2009. The Second Summit made recommendations on how to best achieve the essential acceleration of development by the worldwide materials science and technology community, and developed a declaration to be presented at the United Nations Climate Change Conference in Copenhagen in December 2009. It was concluded that safe nuclear energy is undoubtedly needed in the future energy mix, but it requires reliability and inspectability. Some of the most important challenges in this field are related with fuel cycle issues: new fuels using minor actinides are required with a reprocessing that guarantees security, low volume, and low toxicity. Also, public acceptance of this kind of energy is crucial. The experts agreed that fusion is still an exciting future, where one long lead time priority is first-wall materials. Another important issue was to start to consider CO_2 as a raw material which can be recycled into a chemical fuel. The conclusions also included the necessity for an exponential development of solar energy to the terawatt level. However, the increase in the importance of renewable energy will need totally new concepts to ensure the stability of the electrical transmission grid system. Some of these technologies are approaching grid parity (producing power at the same cost as base load power), but it is not yet clear if they can scale to significant levels based on materials, processes and devices. It was also concluded that sustained societal adoption of these emerging technologies requires educating the public and gaining its support. A clear and easily understood case needs to be made to the public for why clean, renewable, and sustainable energy is a viable and economical option, but it is also important that while the market may initially be stimulated by incentives or tariffs ultimately it will need to be sustainable.



Prospect for electrical energy production. (Courtesy of Prof. J. Amouroux, École Nationale Supérieure de Chimie de Paris (ENSCP), France)

There are significant technical questions related to efficient energy storage that should be addressed in order to determine a viable approach and its integration with the energy source and on the grid. It was conveyed that fuel cells is the cleanest and most efficient way of converting chemical energy directly into electrical energy without combustion. Among the possible energy carriers, hydrogen is ideal, owing to its energy density, for storage and mobile applications in an economy based on renewable energy provided that further developments occur. However, we will need to face several challenges for hydrogen production, such as achieving efficient separation and purification of hydrogen, improving catalysts for the water gas shift reaction that is the present dominant method, improving efficiency for hydrogen production from coal and hydrocarbons, improving the quality and stability of the materials used in water splitting, or decreasing the cost of hydrogen production. It will be also necessary to increase the storage density of hydrogen for mobile applications, increase the efficiency of hydrogen storage and release, alleviate the safety concerns with hydrogen storage, handling, and delivery, construct an infrastructure for hydrogen delivery, and establish international codes and standards for hydrogen storage and delivery. From another side, lithium ion batteries (LiB) represent an efficient solution for CO_2 abatement in the transportation sector. However, to ensure full safety of LiBs, the next frontiers to be released are improvement in the electrolyte (conductivity, temperature of operation, flammability…) and replacement of the graphite electrode by silicon, and latter copper by aluminium, which implies negative electrode materials with high capacity in the □500 mV operating range. Finally, it was clear that bio-energy is a renewable and sustainable energy, with energy cost competitive with fossil sources, and that include environmental cost/compatibility. However, the treatment of cellulose materials is expensive, and efficiency for fermentation has to be increased. It was agreed that it is necessary to establish a balance between food, fuel and other land uses, since economic biomass crops should not compromise food supply. The Second World Materials Summit provided an avenue to create international cooperation to address energy-related materials solutions, traking as priorities the relevant sections of the Kyoto resolution about the climate change. New concepts, closer collaboration between fundamental research and industry, a new and sustained international interdisciplinary materials research collaboration, but also, much closer collaboration between all the countries of world are necessary for this finality. The Summit also proposed to promote the education of a new generation of international scientists, engineers and leaders for leveraging materials science and technology for energy research and development and to provide a clear picture of the challenge, opportunities and career path.

Future Summits will be organized by E-MRS, C-MRS and MRS and held every two years, so the Third World Materials Summit for Energy is approaching at Washington D.C. in 2011.

Chapter 6 IUMRS Awards

6.1 IUMRS Somiya Award

6.1.1 Introduction to Somiya Award

The Sômiya award is named in honor of Dr. Shigeyuki Sômiya, Emeritus Professor of the Tokyo Institute of Technology, and later Dean at Teikyo University of Science and Engineering. Dr. Sômiya is a winner of the MRS Medal and the Japanese Scientific Academic Award.

Professor Sômiya spent his post-graduate years in U.S. and embarked on a series of collaborative research and exchange visits in many countries, starting in 1969 with the U.S.-Japan Workshop in Ceramics -- the very first in materials science. He also actively pursued joint work with colleagues in Europe, and brought many international materials gatherings to Japan.

6.1.2 List of Somiya Award winners

Year of 2019

Winners: Prof. Liming Dai
Affiliation/Country or Area: USA
Recommended by (Society): Case Western Reserve University
Place of award ceremony: Nice, France

Year of 2017

Winners: Prof.Chennupati Jagadish
Affiliation/Country or Area: Australia
Recommended by (Society): Australian National University
Place of award ceremony: Kyoto, Japan

Year of 2015

Winners: Prof. Ruslan Z. Valiev, Prof. Yuntian T. Zhu
Affiliation/Country or Area: Russia, USA
Recommended by (Society): Ufa State Aviation Technical University, North Carolina State University
Place of award ceremony: Jeju, Korea

Year of 2012

Winners: Prof. John A. Kilner
Affiliation/Country or Area: UK
Recommended by (Society): Imperial College London
Place of award ceremony: Yokohama, Japan

Year of 2009

Winners: Prof. Mildred S. Dresselhaus, Prof. Ado Jorio, Dr. Mauricio Terrones, Prof. Riichio Saito, Prof. Morinobu Endo, Prof. Marcos Pimenta, Prof. Antonio G. Souza Filho

Affiliation/Country or Area: USA, Brazil, Mexico, Japan, Japan, Brazil, Brazil

Recommended by (Society):MIT, Universidade Federal de Minas Gerais, Instituto Potosino de Investigacion Cientificay Technologica, Tohoku University, Shinshu University, Universidade Federal de Minas Gerais, Universidade Federal do Ceara

Place of award ceremony: Rio de Janeiro, Brazil

Year of 2007

Winners: Prof. Ivan K. Schuller, Prof. Yvan Bruynseraede

Affiliation/Country or Area: USA, Belgium

Recommended by (Society): University of California, San Diego, Catholic University of Leuven

Place of award ceremony: Bangalore, India

Year of 2005

Winners: Prof. Terence Langdon, Prof. Zenji Horita

Affiliation/Country or Area: USA, Japan

Recommended by (Society): University of Southern California, Kyushu University

Place of award ceremony: Yokohama, Japan

Year of 2004

Winners:Dr. C. N. R. Rao, Dr. Anthony Cheetham

Affiliation/Country or Area: India, USA

Recommended by (Society): JNCASR, Bangalore, University of California at Santa Barbara

Place of award ceremony: San Francisco, USA

Year of 2003

Winners: Dr. Klaas de Groot, Prof. Fu Zhai Cui

Affiliation/Country or Area: Holland, China

Recommended by (Society): IsoTis NV, Tsinghua University

Place of award ceremony: Yokohama, Japan

Year of 2001

Winners: Dr. Antoni Tomsia, Jose Moya

Affiliation/Country or Area: USA, Spain

Recommended by (Society): Berkeley, USA, E-MRS

Place of award ceremony: Cancun, Mexico

Year of 2000

Winners: Dr. X.R. Wu, Dr. J.C. Newman, Jr.

Affiliation/Country or Area: China, USA

Recommended by (Society): Beijing Institute of Aeronautical Materials, NASA Langley Research Centre

Place of award ceremony: Strasbourg, France

6. 2 IUMRS- MRS-SingaporeYoung Research Award

For recognizing the outstanding contributions made by young researchers on materials science, IUMRS and MRS-Singapore have jointly instituted the “IUMRS - MRS Singapore Young Researcher Award”.

The International Conference of Young Researchers on Advanced Materials (ICYRAM) is an initiative of the International Union of Materials Research Societies (IUMRS) and constitutes the inaugural meeting of the Global Materials Network (GMN). It is a conference of-, by- and for- Young Researchers.

The mission of ICYRAM is to provide a platform for researchers under the age of 40 to present technical findings of their research, to network within the international community of other young researchers, and to increase the breadth of their general materials-based knowledge.

The first ICYRAM was organized by MRS-Singapore in Singapore, 2012, aimed to include a wide range of materials research topics, creating nearly 30 independent sessions, arranged under six broad themes: Biomaterials & Healthcare, Carbon-based Materials, Energy & the Environment, Electronic Materials, Magnetic & Spintronic Materials, and Optical Materials. It is the hope that each of the themes will take on the feel of a smaller workshop, promoting the free exchange of ideas and professional camaraderie within and amongst the integrated sessions.

The subsequent ICYRAM conferences were held during 2014, 2016 and 2018 in Haikou China; Bengaluru, India; and Adelaide, Australia, respectively. They were organized by respective Materials Research Societies, and the IUMRS – MRS Singapore Young Researcher award was given out physically at those conferences.

The award package consists of S$5,000 (Singapore dollars five thousand) cash prize, a presentation trophy, and a certificate. The recipient of the award must be personally present at the IUMRS-ICYRAM and give an award lecture. No travel grant is provided by the conference organizers. However, accommodation at one of the modest conference hotels for the conference duration and a waiver of the registration fee is provided.

Those who wish to be considered for the “IUMRS - MRS Singapore Young Researcher Award” must submit their nomination to the Award Subcommittee Chair, at awards@mrs.org.sg. Peer- and organizational- nominations are also welcome subject to the nominee agreeing for the terms and conditions of the award. The submitted nomination package must provide the following: 1. Curriculum Vitae (2-pages maximum) including evidence for the date of birth 2. List of recent key publications (2-pages maximum) 3. Summary of achievements, awards and honors (1-page maximum) 4. Name and brief credentials of the three distinguished materials scientists whom nominee has contacted to provide confidential support letters highlighting the creativity of the nominee and the impact his or her research work has created. These letters must be sent by the supporters directly to Award Subcommittee Chair at awards@mrs.org.sg for the nomination to be considered. The decision of the award subcommittee is final and no enquires will be entertained.

The award for the Year 2012 went to Prof. Xiangfeng Duan from the University of California Los Angeles.

The one held in China in 2014 attracted 48 nominations from different countries. Prof. Ali Khademhosseini from the Harvard Medical School,USA won the award. The finalists are: Prof. Ariando, National University of Singapore, Singapore; Prof. Sergio Brovelli University of Milano-Bicocca, Italy; Prof. Yi Cui, Stanford University, USA, Prof. Jiaxing Huang, Northwestern University□ USA, Prof. Ajayan Vinu, The University of Queensland, Australia and Prof. Xun Wang,Tsinghua University, China.

The most recent one held at Adelaide attracted 35 nominations from 31 different institutes representing 9 countries - Australia, Singapore, China, USA, Switzerland, Germany, Brazil, India & Thailand. The winner was Prof. Andrea Alù from the City University of New York, USA. The following four others are recognized as finalists: James Analytics from UC Berkeley, USA; Laura Na Liu from the University of Heidelberg, Germany; Philip Moll from EPFL, Switzerland and Huiying Yang from Singapore University of Technology and Design.

The rationale for selection of the winners was interdisciplinary and innovative research demonstrating high level of excellence and distinction contributing to the development and fundamental understanding of the concerned topic.

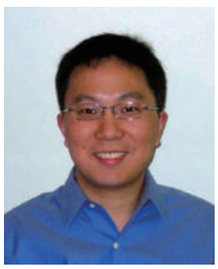
Prof Tan Chorh Chuan, President of National University of Singapore and Prof B.V.R. Chowdari at the Opening Ceremony of inaugural IUMRS-ICYRAM on 2 July 2012

Prof Barry Halliwell, Deputy President of National University of Singapore awarded a medal of Young Research Awards for Prof Xiangfeng Duan at the Award Ceremony of inaugural IUMRS-ICYRAM on 6 July 2012

IUMRS President Prof. Osamu Takai and Prof. B.V.R. Chowdari awarded a medal of Young Research Awards for Prof. Ali Khademhosseini at the Second IUMRS-ICYRAM (International Conferences for Young Researchers on Advanced Materials) in Haikou, China, Oct. 26, 2014

6.2.2 List of Young Research Awards

Year of 2012



Prof. Xiangfeng Duan

Winners: Prof. Xiangfeng Duan
Affiliation/Country or Area: USA
Recommended by (Society): University of California Los Angeles
Place of award ceremony: Singapore

Year of 2014

Prof. Ali Khademhosseini

Winners: Prof. Ali Khademhosseini
Affiliation/Country or Area: USA
Recommended by (Society): MIT
Place of award ceremony: Haikou, China

Prof. Ali Khademhosseini received a BASc (1999) and MASc (2001) in Chemical Engineering from the University of Toronto and Ph.D. in Bioengineering from the Massachusetts Institute of Technology (2005). Currently, he is an Associate Professor at Harvard-MIT Division of Health Sciences and Technology, Brigham and Women's Hospital, and Harvard Medical School; and an Associate Faculty at the Wyss Institute for Biologically Inspired Engineering at Harvard University. Additionally, he serves as an Adjunct Professor in the Department of Biomedical Engineering at the University of Texas at Austin and a Junior Principal Investigator at Japan's World Premier International – Advanced Institute for Materials Research at Tohoku University.

The Khademhosseini Lab is centered on the development of micro-scale biomaterials and engineered systems to control cellular behaviors for applications in tissue engineering. Current research aims to develop technologies that will control the formation of vas cularized tissues with proper micro-architectures and regulate stem cell differentiation within these micro-engineered systems. Professor Khademhosseini will discuss his latest findings in a presentation titled "Wnt5a Conjugated Poly(ethylene glycol)-Gelatin Composite for Vascularized Tissue Engineering" at the AIChE Annual Meeting, which commences on October 28, 2012 in Pittsburgh, Pennsylvania, USA.

Dr. Khademhosseini's contributions have been recognized by over thirty national and international awards. A testament to the interdisciplinary nature of his research, Dr. Khademhosseini was the recipient of early career awards from IEEE (IEEE Engineering in Medicine and Biology award / IEEE Nanotechnology award), AIChE (Colburn Award), and ASME (YC Fung Award); and young investigator awards from the Society for Biomaterials, the Tissue Engineering and Regenerative Medicine International Society – North America, and the American Chemical Society (BIOT Young Investigator Award). He was also awarded the Royal Society of Chemistry's 2011 Pioneers of Miniaturization Prize for his work in microscale tissue engineering and microfluidics, the International Union of Pure and Applied Chemistry (IUPAC) Polymer award, and the Society for Laboratory Automation and Screening Innovation award. Dr. Khademhosseini has received an NSF Career award, an Office of Naval Research Young Investigator Award, and the Presidential Early Career Award for Scientists and Engineers, the highest honor given by the US government of early career investigators. He is also a fellow of the American Institute of Medical and Biological Engineering.

Year of 2018

Winners: Andrea Alù
Affiliation/Country or Area: USA
Recommended by (Society): City University of New York
Place of award ceremony: Adelaide, Australia

6.3 Global Leadership and Service Award

6.3.1 Introduction to Global Leadership and Service Award

The world community is more interconnected today than ever before, not simply in commerce and trade, but particularly in key integral areas such as energy, environment, health, security, education and economies. Successful future development will require effective and well-informed leadership from governments, institutions, and international companies working together, along with the participation of all citizens. Facing with unprecedented global issues, materials science and engineering is playing a significant, on-going role in innovative development towards a sustainable world for all to live in.

The IUMRS has a mission of supporting excellence in materials research and education, and development of future leaders to work together for a world that has critical needs in order to sustain itself. Accordingly, to promote this mission, IUMRS announced the Global Leadership and Service Award. This Award will be given to individuals who have demonstrated outstanding leadership through service having measurable impact to the global community, relating to materials research and education. Professor Rodrigo Martins will serve as the first chair of the subcommittee on Global Leadership and Service Award for the IUMRS.

6.3.2 List of Global Leadership and Service Awards

Year of 2015

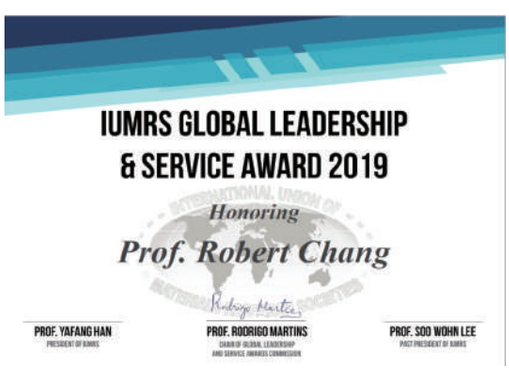
a) Winners: Prof. Mihail Roco, Mr. Christos Tokamanis, Prof. Paul Siffert
b) Affiliation/Country or Area: USA, Europe, Europe
c) Recommended by (Society): NSF, E-MRS, E-MRS
d) Place of award ceremony: Brussels, Belgium

Year of 2016

a) Winners: Prof. Wan Gang, Prof. Graca Carvalho, Prof. Sukekatsu Ushioda
b) Affiliation/Country or Area: China, Portugal, Japan
c) Recommended by (Society): Science and Technology of China, E-MRS, National Institute of Materials Science
d) Place of award ceremony: Brussels, Belgium

Year of 2019

a) Winners: Prof. Robert Chang, Dr. Carlos Moedas
b) Affiliation/Country or Area: USA, Europe
c) Recommended by (Society): Northwestern University, E-MRS
d) Place of award ceremony: Nice, France



6.4 Words from Sômiya Award winners

6.4.1 First Sômiya Award Winner in 2000 (Dr. J.C. Newman, Jr., NASA, USA and Xueren Wu, BIAM, China)

Prof. James C.

Dr. J.C. Newman, Jr., Langley Research Center, National Aeronautics and Space Administration (NASA) and Dr. X.R. Wu, Beijing Institute of Aeronautical Materials (BIAM), Chinese Aeronautical Establishment (CAE) were the first recipients of the International Union of Materials Research Society's (IUMRS) Sômiya Award for International Collaboration for their collaborative work on aeronautical materials. A NASA/CAE Reference Pubication-1309, May 1994, on "Small-Crack Effects in High-Strength Aluminum Alloys—a NASA/CAE Cooperative Program" and two technical papers were published in 1998 and 1999. Colleagues and co-authors of the research work were: W. Zhao, M.H. Swain, C.F, Ding and E.P. Phillips. Drs. S.L. Venneri, NASA, and C.G. Li, CAE, were program managers.

Shigeyuki Sômiya (Teikyo University of Science and Technology, Japan) presents the first Sômiya Award to X.R. Wu of the Beijing Institute of Aeronautical Materials, China (right), and James C. Newman of NASA Langley Research Center, USA (left), at the E-MRS-IUMRS-ICEM-2000 meeting in Strasbourg, France, on May 31

https://www.cambridge.org/core/services/aop-cambridge-core/content/view/S0883769400027937

Photos below show the group in China (BIAM) in 1985 and in United States (NASA Langley) in 1987; and several other photos taken in Strasbourg, France (2000). The NASA/CAE research has helped to develop the small-crack theory for predicting "fatigue" life of engineered metallic materials.

First CAE-NASA Meeting-1985

NASA-CAE Meeting-1987

Memories Photos of IUMRS – 2000

Emeritus Professor James C. Newman

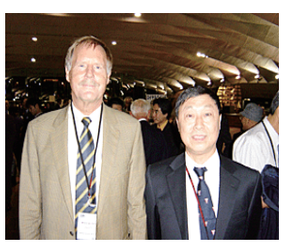
Mississippi State University

1 Jim C. Newman, Jr., Richard H. Johnson Chair and Emeritus Giles Distinguished Professor, Department of Aerospace, Mississippi State University, USA.

http://www.ae.msstate.edu/people/faculty/james-newman

6.4.2 2003 Sômiya Award winners (Prof. Fuzhai Cui from Tsinghua University, China and Dr. Klaas de Groot, Iso Tis NV, Holland)

Under the Support of IUMRS, the Biomimetic Mineralized Collagen Bone Grafts Achieved Success



Prof. Fuzhai Cui (right) , Tsinghua University, China

Bone defects refer to situations in which the integrity of the phalanx structure is destroyed. The main causes of bone defects include trauma, bone tumors, degenerative diseases, infections, osteomyelitis, and a variety of congenital diseases. Since the ability of bones to repair themselves is limited, the treatment of bone defects is necessary. The identification of proper bone defect repair materials is a goal long-pursued by scientists. Globally, there are 20 million orthopedic surgeries per year, 70% of which need bone grafts for bone defect repair. Clinically, autologous grafts are considered as gold standard for the treatment of bone defects. However, the limited availability and the side effects associated make it compelling to look for alternative sources of bone grafts.

Tissue engineering was first introduced in the 1980s by Langer and Vacanti. It is a principle and technique that applies engineering and life sciences to the design and manufacture of a structure that rebuilds or repairs tissues and organs and maintains or enhances tissue functions. Applying the principle of tissue engineering to the development of bone grafts, bone tissue engineering emerges as an interdisciplinary field. Its emergence brings new hope for bone tissue repair.

It is widely accepted that ideal bone defect repair materials should be characterized by safety, high biocompatibility, excellent biodegradability, and good osteoconductivity. Given that traditional bone defect repair materials (natural polymers, biologically derived bone framework materials, bioactive ceramics, synthetic polymeric materials, and bone substitute materials based on HA) are far from satisfactory, it is important to develop better bone defect repair materials.

Tsinghua University Biomaterials Research Group had long been focusing on the hierarchical self-assembly of nano-fibrils in mineralized collagen. Their research was supported by IUMRS and was encouraged by the 2003 Sômiya Award for International Collaborative Research from IUMRS (Picture 1). After a long period of hard work, they made a breakthrough in 2003. In the paper published in *Chemistry of Materials*, they described their study of nano-fibrils of mineralized collagen with the help of conventional and high-resolution transmission electron spectroscopy and revealed the three stages in which the hierarchical self-assembly occurs.

The achievement was extensively reported and highly remarked by top international academic journals and websites. *Nature Materials* reported the discovery and stated that it gives "the first direct evidence" to the theory that "nanocrystals of the minerals were deposited along the surface of the fibrils". It pointed out that "these results should improve the understanding of collagen-mediated mineralization in other calcified tissues, and point the way to new functional materials for biomimetic engineering" (Picture 2). The Website of the American Chemical Society highlighted the discovery, too (Picture 3).

The discovery of the hierarchical self-assembly mechanism paved the way for the development of biomimetic mineralized collagen bone grafts. Tsinghua University Biomaterials Research Group identified the appropriate conditions for the self-assembly of mineralized collagen fibers in human bones—that is, the right pH, temperature, and ion concentration for the self-assembly—and successfully synthesized mineralized collagen which is the first case of biomimetic mineralization resulting in synthetic material with ingredients and microstructure identical to those of natural bones.

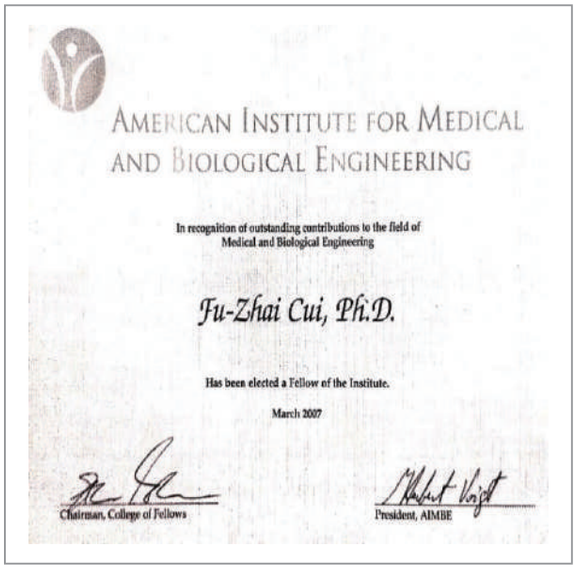
In recognition of his outstanding contribution to the field of medical and biological engineering, American Institute for Medical and Biological Engineering elected the key member of the research group, Professor Fuzhai Cui, a fellow in 2007 (Picture 4). In recognition of his significant achievements in the development of bone defect repair materials, International Union of Societies for Biomaterials Science and Engineering elected Professor Fuzhai Cui a fellow in 2008 (Picture 5). Domestically, Professor Cui was awarded the Second National Prize for Technological Invention in 2008 and was awarded the Second National Prize for Natural Science in 2011 (with the Academician of Chinese Academy of Engineering Hengde Li as co-winner) (Pictures 6 and 7).

In order to ensure the safety and effectiveness of biomimetic mineralized collagen bone grafts in clinical application, numerous in vitro and animal experiments have been done in different labs. In vitro experiments demonstrate that biomimetic mineralized collagen has no stimulatory effect and produces no sensitization reaction. It is neither acutely nor chronically toxic. Nor is it genetically toxic.

Animal experiments have been done with rabbits, rats, sheep, pigs, and dogs to verify the effectiveness of biomimetic mineralized collagen bone grafts in bone defect repair, spinal fusion, and canine extraction site preservation. They demonstrate that biomimetic mineralized collagen bone grafts are characterized by high biocompatibility, excellent biodegradability, and good osteoconductivity.

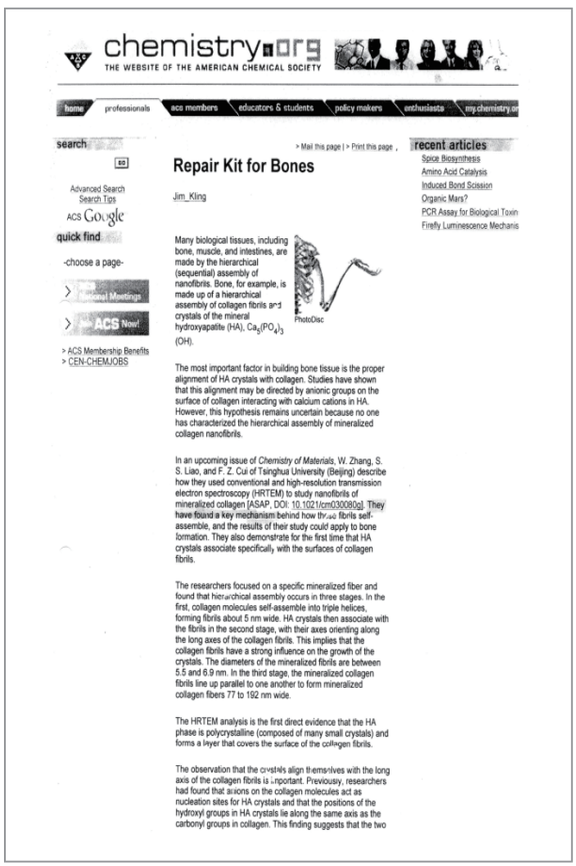
In 2014, biomimetic mineralized collagen bone grafts was approved by the China Food and Drug Administration (CFDA); in 2015, it was approved by the U.S Food and Drug Administration (U. S. FDA). After its approval by FDA and CFDA, biomimetic mineralized collagen bone grafts have been used in successful treatments of more than 1.5 million patients worldwide. They have made significant contribution to the improvement of people's health and well-being.

Picture 1



Picture2

Picture3



Picture 4

◎ Fuzhai Cui, Professor, Tsinghua University, Materials Science & Engineering, China.
https://fellowsbse.org/current-fellows/fu-zhai-cui/

6.4.3 The 2012 Sômiya Award winners (Prof. John A. Kilner, Imperial College London, UK)

Prof. John A. Kilner

In the autumn of 2012, it was my great honour to be the leader of a team awarded the IUMRS Sômiya Award for the collaborative work we were pursuing into the "Design of ionic and mixed conducting ceramics for fuel cell applications". The award was made at the IUMRS Conference in Yokohama, Japan in September 2012. The international team (Figure 1) consisted of Imperial College London, the International Institute for Carbon Neutral Energy Research (I^2CNER) in Kyushu, Massachusetts Institute of Technology (MIT) and the Catalan Institute of Nanoscience and Nanotechnology (ICN2).

The 2012 S*ô*miya Award team. From L to R: Prof Santiso, ICN2. Prof John Kilner Imperial College, London, Professor Harry Tuller, MIT, Professor Tatsumi Ishihara, I2CNER, Prof Bilge Yidiz, MIT

The Sômiya Award proved to be a great help in furthering the collaboration between the members of the team. We have continued this close collaboration, and this has resulted in two of the Sômiya Award partners, Imperial and I^2CNER being awarded the Diawa Adrian Prize for UK/Japanese collaborative research work in 2016 (http://dajf.org.uk/grants-awards-prizes/daiwa-adrian-prizes). Following these successes, the same two members of the original team Imperial, and I^2CNER, applied for a JSPS Core to Core award to work on Solid Oxide Interfaces for Faster Ion Transport (SOIFIT, http://www.soifit.net/en/) for the optimisation of solid state ionic devices such as batteries and fuel cells with MIT as an associated partner. This major collaborative grant was awarded in 2017. We are very grateful to the IUMRS for the opportunity the Sômiya award has given us to give a global reach to our research into the fundamental aspects of materials for application in clean low carbon energy conversion and storage.

J.A Kilner

◎ John A. Kilner, Faculty of Engineering, Department of Materials, Professor, BCH Steele Chair in Energy Materials, Department of Materials, Imperial College, UK.
http://www.imperial.ac.uk/people/j.kilner

6.4.4 The 2015 Sômiya Award winners (Professor Ruslan Z. Valiev, Ufa State Aviation Technical University, Russia) and Professor Yuntian T. Zhu, North Carolina State University, USA)

Prof. Ruslan Z. Valiev, Mississippi State University, USA

Prof. Yuntian Zhu North Carolina State University, USA

The 2015 Sômiya Award was presented to an international collaboration team consisting of Ruslan Z. Valiev (Russia) and Yuntian T. Zhu (USA) for "Resolving the Paradox of Superior Strength and Ductility of Ultrafine-grained Metals through Microstructural Design" (see Fig. 1) during the awards ceremony at the International Union of Materials Research Societies, International Conference on Advanced Materials (IUMRS-ICAM 2015) held on October 25-29 in Jeju, Korea (Fig. 2).

The ceremony of the 2015 Sômiya Award prompted the members of the International NanoSPD Steering Committee to organize and host the symposium "SPD: Innovative Processes for High-performance Structural and Functional Materials" at the IUMRS-ICAM 2017 held in Kyoto, Japan on August 27 – September 01, 2017 with Prof. Zenji Horita of Kyushu University serving as the primary organizer and chairman of the event. This symposium provided a forum to exchange information and ideas related to a wide range of relevant topics: process development, simulation and modeling, enhancement of mechanical and physical properties as well as practical application of the SPD processes.

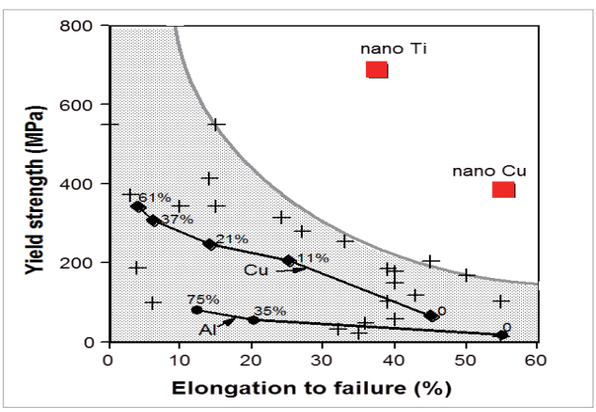


Fig. 1 The extraordinary combination of both high strength and high ductility in nanostructured Cu and Ti processed by SPD clearly sets them apart from coarse-grained metals (marked as +), including Au, Be, Ca, Co, Fe, Hf, Mg, Mo, Nb, Ni, Pd, Pt, Re, Ru, Ta, Th, Ti, U, V, W [for more details, please, refer to R.Z. Valiev, Y.T. Zhu, Transactions of the Materials Research Society of Japan, vol. 40 (4) (2015), pp. 309-318]

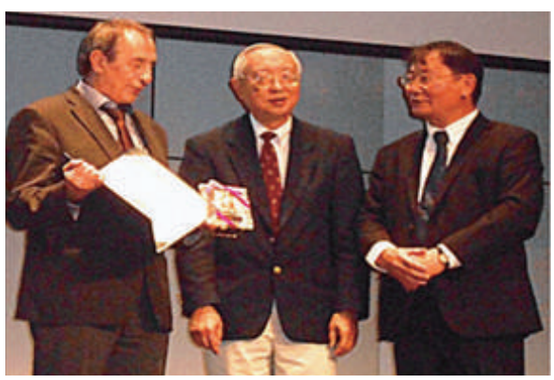


Fig. 2. The photo shows RuslanValiev receiving the awards, presented by General Secretary of IUMRS, Prof. Robert P.H. Chang (center) and the Conference Chair, Prof. Soo Wohn Lee (right).

Professor, Director Ruslan Z. Valiev

- Ruslan Z. Valiev, Professor, Director, Institute of Physics of Advanced Materials, Ufa State Aviation Technical University, Russia.
  http://www.ipam.ugatu.ac.ru/people/valiev.html
- Yuntian T. Zhu, Distinguished Professor of Materials Science & Engineering, North Carolina State University, USA; Editor-in-Chief: Materials Research Letters.https://www.mse.ncsu.edu/people/ytzhu/

6.4.5 The 2017 Sômiya Award winners(Prof.Chennupati Jagadish, Australian National University, Australia)

Prof. Chennupati Jagadish

It was a great honour to be awarded the 2017 Somiya Prize for leading an international collaboration on "*Semiconductor Nanowires: Growth, Characterization, Processing and Optoelectonic Devices*". The collaboration comprised Prof. Leigh M. Smith at the University of Cincinnati (USA), Prof. Michael B. Johnston at the Oxford University (UK), Prof. Jin Zou at the University of Queensland (Australia) and Prof. Antonio Polimeni at Sapienza Università di Roma (Italy). The collaborative effort was aimed at understanding the fundamental properties of nanowires (semiconductor nanostructures with a filamentary shape) and their exploitation in practical optoelectronic devices, such as lasers, detectors and sensors.

The cross-fertilization between Materials Science, Chemistry, Solid State Physics and Device Engineering was pivotal to the success of the collaboration.

We are grateful to IUMRS for awarding this partnership that is still continuing with success and has permitted to establish new collaborations on diverse topics.

The ceremony of the 2017 IUMRS Somiya Award was held in Kyoto on August 30 during the 15th International Conference on Advanced Materials organized by the Japan Materials Research Society.

Professor Chennupati Jagadish
Department of Electronic Materials Engineering, Research School of Physics
Australian National University, Canberra, Australia

Prof. Jim Williams (IUMRS) presenting 2017 IUMRS Somiya Award to Prof. Chennupati Jagadish

From left: Prof. Toshi Mori (NIMS, Japan), Prof. C. Jagadish (Australian National University), Prof. A. Polimeni (Sapienza, Università di Roma), Prof. H. J. Joyce (Oxford University) and Prof. Jim Williams (Australian National University).

Web link: http://www.iumrs-icam2017.org/award/somiya.html

6.4.6 The 2019 Sômiya Award Winners (Prof. Liming Dai, Case Western Reserve University, USA)

Prof. Liming Dai, CWRU, USA

Prof. Liming Dai, Case Western Reserve University (CWRU, USA), Prof. Jian-Feng Chen, Beijing University of Chemical Technology (BUCT, China), and Prof. Zhenhai Xia, University of North Texas (UNT, USA) were the recipients of The 2019 International Union of Materials Research Society's (IUMRS) Sômiya Award for their collaborative work on "Carbon Nanomaterials as Metal-Free Catalysts for Renewable Energy Generation and Storage". The award was made at the 2019 IUMRS-ICAM Conference in Nice, France, on May 29, 2019.

We appreciate IUMRS for recognizing our pioneering work and the importance of the field of metal-free carbon electrocatalysts. The Sômiya Award proved to be very helpful for further enhancing the international collaboration between our team members and for facilitating the rapid development of this emerging field. Our trans-Pacific international collaboration has since evolved into intercontinental collaboration cross three continents as the team leader, Professor Liming Dai, has recently moved to University of New South Wales in Sydney to take up an Australian Laureate Fellowship (https://www.arc.gov.au/grants/discovery-program/australian-laureate-fellowships). We are grateful to IUMRS and look forward to continued support from IUMRS!

Photo 1 The photo shows Liming Dai and Zhenhai Xia receiving the awards, presented by General Secretary of IUMRS, Prof. Robert P. H. Chang and the IUMRS President, Prof. Yafang Han (Award recipient Jian-Feng Chen is not in the picture)

From right: 1. Yafang Han, 2. Zhenhai Xia, 3. Liming Dai, 4. Robert P.P. H. Chang

Photo 2 This photo was taken with IUMRS' EC and GA members immediately after the award ceremony.

From right: 1. Toishyuki Mori, 2. Ziqiang Dong, 3. Lianzhou Wang, 4. Yafang Han, 5. Liming Dai, 6. Rodrigo Martins, 7. Zhenhai Xia, 8. Zhong Lin Wang, 9. Ying Wu, 10. Yuan Ping Feng

Chapter 7 IUMRS Statutes and By–laws

INTERNATIONAL UNION OF MATERIALS RESEARCH SOCIETIES

(IUMRS)

STATUTES Approved at the IUMRS Annual General Assembly, Korea, 25 October, 2015

I. Description and Objectives

A. The International Union of Materials Research Societies (referred to as IUMRS throughout this document) is constituted as an international union of technical groups or societies which have interest in promoting interdisciplinary materials research. The aim of IUMRS is exclusively not for profit. The terms General Assembly and Executive Council, as employed in these Statutes, are defined by Articles V.A and V.B, respectively.

B. The objectives of IUMRS are:

1 To facilitate international cooperation among materials research organizations.
2 To contribute to the advancement of materials research in all its aspects.
3 To advance the multidisciplinary nature of materials research internationally.
4 To promote information exchange among national or regional societies with interests in interdisciplinary materials research, and to work to coordinate their activities.
5 To promote communication of international materials research activities through appropriate media.
6 To publish international communications and reviews.
7 To coordinate, develop, promote and encourage series of distinguished international conferences, workshops and outreach activities, in collaboration with IUMRS members worldwide.
8 To promote materials science education worldwide.

C. IUMRS shall have the power:

1 To establish and develop a vigorous and productive union of materials research organizations.
2 To foster the establishment of national or regional groups or societies whose primary interest embraces interdisciplinary materials research.
3 To provide information to assist developing materials research societies or groups, concerning services and resources which may be available from established societies or groups.
4 To participate in organizing and endorsing appropriate international materials research meetings and related events such as workshops, summer schools, topical meetings, and outreach activities on subjects falling within the purview of IUMRS.
5 To create commissions and other committees for specific tasks.
6 To adhere to the International Council of Scientific Unions and similar super-national organizations.

7 To participate in joint commissions with other unions or other scientific bodies in matters of interest to IUMRS.

8 To engage in professional advocacy relating to issues of public policy in which IUMRS members have relevant expertise or concerns.

II. Membership

A. General

1. Members of IUMRS are:
   a. Adhering Bodies (societies, or associations of societies, whose purpose is to promote interdisciplinary materials research and that represent a well-defined region of the world);
   b. Professional Associates (other societies, or associations of societies, whose purpose is to promote materials research).
   c. Affiliated Organizations (other private or public organizations whose activities and interests serve to support, promote, or benefit from, multi-disciplinary materials research)
2. As employed in these Statutes, the terms "Member" and "Membership" shall apply to Adhering Bodies, Professional Associates and Affiliated Organizations unless further qualified. The term "Partner" shall include Affiliated Organizations and Professional Associates. The term "Adherence" shall apply only to Adhering Bodies.
3. Membership Requirements
   a. Membership as an Adhering Body in IUMRS is subject to the requirements of Article II.B of these Statutes.
   b. Membership as a Partner in IUMRS is subject to the requirements of Article III.B or IV.B, as appropriate.
4. Regional Requirements
   a. Adherence shall be limited to one Adhering Body from a nation or distinct geographical region, as defined by the General Assembly. Applicants for adherence shall be considered with reference to their demonstrated ability and commitment to fruitfully aid in the pursuit of the objectives of IUMRS.
   b. IUMRS membership as a Partner shall not be constrained by geographic region. Applicants for Partner status shall be considered with reference to their demonstrated interest in the activities and objectives of IUMRS and in the outcomes of those activities.
   c. Current Adhering Bodies whose region of activity significantly overlaps that of a proposed new Adhering Body shall have the opportunity to review the membership application for mutual compatibility, prior to its presentation for General Assembly or Executive Council action.
5. Categories of Adherence
   a. Participation as an Adhering Body shall be in one of several categories, with corresponding voting powers in the General Assembly and annual financial obligations associated with each category, as detailed below.

Category of Participation	I	II	II	IV	V
Number of Votes	1	2	3	4	5
Number of Unit Contributions	nominal fee	1	3	4	5

The Category of Participation is subject to approval for each Adhering Body by the General Assembly. The General Assembly sets the Unit Contribution in terms of a currency to be designated by the Executive Council and may reassess this Unit Contribution from time to time. Changes will apply to the calendar year following General Assembly approval and continue until subsequent updates take effect.

b. The highest category available to a specific Adhering Body must be approved by the General Assembly and may be raised or lowered by the General Assembly based on criteria to be enacted by the General Assembly in IUMRS Bylaws or separate resolutions.

c. An Adhering Body may choose to participate in any category equal to, or below, the highest category currently approved by the General Assembly.

6. Participation as a Partner is subject to an annual fee, to be set by the General Assembly in terms of a percentage of the Unit Contribution as defined in Article II.A.5a of these Statutes and reviewed from time to time by the General Assembly. An organization may be exempted from this fee by action of the Executive Council, if special circumstances apply, including documented in-kind contributions..

B. Application for Adherence

1 A request for adherence shall be submitted to the IUMRS Secretary. Detailed application guidelines shall be published by IUMRS. The application should satisfy criteria enacted by the General Assembly in IUMRS Bylaws or separate resolutions.

2 Membership as an Adhering Body may be conferred only by approval of the application by the General Assembly, requiring a majority vote of the total voting power assigned to all Adhering Bodies in good standing, whether or not they are participating in-person, electronically, or by proxy in the meeting of the General Assembly where the vote is taken.

C. Cessation of Membership

1 An Adhering Body may withdraw from IUMRS by giving three months advance written notice to the IUMRS Secretary. A Partner organization may withdraw from IUMRS without prior notice. In both cases, fees covering the remainder of the fiscal year in which the withdrawal occurs will be forfeit.

2 The membership of an Adhering Body or Partner is automatically subject to suspension if it has not paid its financial obligations for a period of two consecutive years, provided that it has received a warning six months in advance of the date automatic suspension would occur. Adherence can be reinstated by the General Assembly, and Partner status can be reinstated by the Executive Council, to take effect following payment of financial obligation for the current calendar year. Membership in IUMRS ends automatically if the member organization is dissolved for any reason.

3 An Adhering Body can be expelled from membership if the General Assembly finds that (a) that the relationship of the Adhering Body to the field of interdisciplinary materials research and its practitioners is no longer consistent with the objectives and character of IUMRS, or (b) the Adhering Body has behaved in a manner that reflects poorly on the reputation of IUMRS, or (c) the Adhering Body has not participated in the activities of IUMRS for a period of two consecutive years, or (d) the Adhering Body has not provided a written report of its activities to the General Assembly for a period of two consecutive years. Expulsion requires a two-thirds majority vote of the total voting power assigned to all Adhering Bodies in good standing, whether or not participating in-person, or electronically, or by proxy in the meeting of the General Assembly where the vote is taken.

D. The Founding Adhering Bodies

The Founding Adhering Bodies of IUMRS are the Materials Research Society, the European Materials Research Society; the Chinese Materials Research Society; the Mexican Materials Research Society; the Materials Research Society of Taiwan; the Materials Research Society of Japan; the Materials Research Society of India; the Australian Materials Research Society.

E. Rights and Duties of Members

1.Adhering Bodies

a. Each Adhering Body is responsible for its own internal structure and organization.

b. Each Adhering Body is responsible for and free to determine its own activities and is expected to give IUMRS effective prior notice of its technical meetings, workshops, summer schools, and other sched-

uled programs that may be of interest to the international materials research community. This prior notice should be provided in a timely way.

c. Each Adhering Body chooses its delegates for meetings of the General Assembly, subject to the limitations in the number of delegates set by the General Assembly. The number of votes accorded to an Adhering Body is determined by its Category of Participation as described in Article II.A.5a of these Statutes. The Adhering Body determines how to divide the available votes among its delegates, noting that fractional votes may not be cast at meetings of the General Assembly.

d. An Adhering Body must advise the Secretary of any significant change in its purpose, structure or profile, in the course of time.

2. Partners

See Articles III and IV.

III. Professional Associate Membership

A. General

1. Professional Associate status may be held by institutions that conduct, support or promote materials research, materials education, or related community outreach, including leading universities, academic, government or industrial research centers, and foundations whose mission complements, reinforces, or links with that of IUMRS. Also included are (a) organizations that promote or fund international exchanges and interactions that involve materials research professionals, and (b) societies involving individuals and consortia whose members are engaged in materials research and its applications.
2. Professional Associate membership is open to qualified organizations regardless of geographical location.

B. Application for Professional Associate Membership

1. The basic criterion for admission to Professional Associate membership is evidence that the organization supports and will be beneficial to the general objectives of IUMRS.
2. A request for Professional Associate membership must be submitted to the IUMRS Secretary, providing supporting evidence about the organization. A Commission on Membership Affairs or an equivalent committee will review and recommend an action on the application.
3. The Executive Council can approve a request for Professional Associate membership.

C. Rights and Obligations of Professional Associates

1. Professional Associates are encouraged to participate in the activities and programs of IUMRS and its Commissions.
2. Professional Associates are eligible for benefits to be determined from time to time by the Executive Council.

D. Termination of Professional Associate Membership Membership of a Professional Associate may be terminated by action of the Executive Council, if the member is deemed to no longer satisfy the admission criteria of Article III.B.1.

IV. Affiliated Organization Membership

A. General

1. Affiliated Organization status may be held by businesses or corporations having a local, regional, or global presence and wishing to support or participate in the activities of IUMRS, or benefit from closer interactions with the materials research community.
2. Affiliated Organization status is open to qualified organizations, regardless of geographical location.

B. Application for Affiliated Organization Membership

1. The basic criterion for admission to Affiliated Organization membership is evidence that the organization supports and will be beneficial to the general objectives of IUMRS.
2. A request for Affiliated Organization Membership must be submitted to the Secretary of IUMRS, provid-

ing supporting evidence about the organization. A Commission on Membership Affairs or an equivalent committee will review and recommend an action on the application.

3. The Executive Council of IUMRS can approve a request for Affiliated Organization membership.

C. Rights and Obligations of Affiliated Organizations

1. Affiliated Organizations are encouraged to participate in the activities and programs of IUMRS and its Commissions.
2. Affiliated Organizations are eligible for benefits to be determined from time to time by the Executive Council.

D. Termination of Affiliated Organization Membership

Membership of an Affiliated Organization may be terminated by action of the Executive Council, if the member is deemed to no longer satisfy the admission criteria of Article IV.B,1.

V. Structure and Organization

The work of IUMRS shall be conducted by (A) the General Assembly, (B) the Executive Council composed of the officers of IUMRS plus any (non-voting) senior executive staff so designated by action of the officer members of the Executive Council, and (C) Commissions, .which may be created and empowered by the Executive Council.

A. General Assembly

1. The General Assembly is the highest authority of IUMRS and is composed of delegates appointed by the Adhering Bodies. The General Assembly has responsibility for the direction of all affairs and activities of IUMRS.
2. The General Assembly shall
   a. determine membership fees and assessments for Adhering Bodies, Affiliated Organizations and Professional Associates
   b. elect the officers who comprise the Executive Council
   c. approve applications for adherence
   d. determine the number of delegates that may represent an Adhering Body in meetings of the General Assembly
   e. delegate to the Executive Council those operational responsibilities that it deems appropriate.
3. The General Assembly shall have the power
   a. to amend these Statutes and to formulate and amend Bylaws on any matters not covered by the Statutes
   b. to establish any board, official position or representative that it may deem necessary for the work of IUMRS
   c. to dissolve any board, official position or representative appointment previously established when it is no longer deemed necessary
   d. to suspend or cancel the membership of any Adhering Body in accordance with Articles II.C.2 and II.C.3
4. General Assembly Meetings and Procedure
   a. The Annual General Assembly meeting shall normally be held at the site and time of an international conference hosted by an Adhering Body. A quorum for the Annual General Assembly meeting shall be the participation or representation by proxy of delegates representing two-thirds of the total voting power accorded to all of the Adhering Bodies in good financial standing. In order to be adopted a motion must be accepted by a majority of the votes cast based on voting power assigned to the delegates participating in person or by proxy, unless otherwise noted in these Statutes.
   b. The meetings of the General Assembly will be conducted according to the procedures outlined by

Robert's Rules of Order. A Parliamentarian appointed by the Executive Council who is well versed in those Rules may advise the presiding officer of the meetings on procedural issues during the conduct of the General Assembly meetings. Final decisions on procedural issues and Points of Order will be made by the presiding officer, who is normally the President of IUMRS or his/her designee. Additional procedures applicable to its annual and interim meetings shall be enacted by the General Assembly in IUMRS Bylaws or separate resolutions.

5. The maximum voting power available for an Adhering Body in good financial standing at all meetings of the General Assembly, whether in-person, by mail ballot or by electronic means, shall correspond to its Category of Participation according to Article II.A.5a.

B. Executive Council

1. The voting members of the Executive Council are the officers of IUMRS. These are (a) the President, (b) the First Vice President, (c) the Second Vice President, (d) the Secretary, (e) the Treasurer, and (f) the Immediate Past President. Occupants of any executive staff positions may serve as non-voting, ex officio members of the Executive Council.
2. The First and Second Vice Presidents, the Secretary, and the Treasurer are elected by the General Assembly. The first Vice President automatically becomes the President when his/her term as Vice President is completed, and becomes Immediate Past President when his/her 2-year term as President is completed. The First Vice President and Second Vice President are elected for two-year staggered terms. The Secretary and Treasurer are elected for two-year staggered terms. The First Vice President and the Secretary are elected in the same year. The Second Vice President and the Treasurer are elected in the same year. The Secretary and the Treasurer may each serve two consecutive terms.
3. Officers must be delegates of Adhering Bodies at General Assemblies, and no more than two officers can represent the same Adhering Body.
4. The Executive Council acts by authority delegated by the General Assembly and is responsible to the General Assembly for overseeing and managing the activities of IUMRS in conformity with the spirit and letter of the Statutes, and implementing the Bylaws and resolutions enacted by the General Assembly. The President or his/her designee presides over the meetings of the General Assembly. The Treasurer administers the finances of IUMRS and prepares the budget. The Secretary or his/her representative is responsible for taking minutes of all General Assembly and Executive Council meetings. Interim meetings and balloting of the General Assembly can be called by the Executive Council.
5. The Executive Council is responsible for the establishment and oversight of Commissions having specific functions integral to the work of IUMRS. Such Commissions are responsible to the Executive Council.
6. The Executive Council is responsible for appointing Chairpersons and members of Commissions, in accordance with criteria enacted by the General Assembly in IUMRS Bylaws or separate resolutions.
7. The Executive Council is responsible for preparing an agenda for meetings of the General Assembly.
8. The Executive Council is empowered to approve applications for sponsorship, cosponsorship or endorsement of scientific meetings, workshops, or other activities relevant to the interests of IUMRS members.
9. The President is the official spokesperson for IUMRS. Any proposed public policy statements to be issued formally on behalf of IUMRS must first be approved by the Executive Council.

C. Commissions

1. Commissions are committees or other bodies created by the Executive Council for specific tasks. They are responsible to the Executive Council. (Article V.B.5)
2. The Chairperson and members of the Commission are appointed by the Executive Council. (Article V.B.6)
3. The Chairperson is responsible for reporting the activities of the Commission to the Executive Council and the General Assembly.

4. A Commission shall be sustained as long as it continues to serve an appropriate function for IUMRS. A Commission may be dissolved by action of the Executive Council if it no longer serves the needs of IUMRS. (Article V.B.5)

VI.Finances

A. The Executive Council through the Treasurer shall be responsible to the General Assembly for all the financial affairs of IUMRS. The Treasurer is responsible for preparing a projected budget for each successive fiscal year for timely approval by the General Assembly. The General Assembly may enact detailed financial management protocols in IUMRS Bylaws or as individual resolutions.

B. The Chairperson of each Commission is responsible to the Executive Council for expenditures of funds by the Commission. The projected budget for each Commission should be included in the IUMRS projected budget. Commission expenditures beyond those budgeted require specific approval by the Executive Council.

VII. Liability

A. IUMRS is liable only to the extent of its assets. No Member is individually liable for IUMRS debts and liabilities.

B. Liabilities of the Adhering Bodies to IUMRS are limited to the payment of their predetermined number of Unit Contributions as authorized under Article II.A.5a of these Statutes and to any other contributions they may have pledged. Liabilities of Partners to IUMRS are limited to the payment of their fees as authorized under Article II.A.6 of these Statutes.

C. No officer of IUMRS shall be individually liable for the corporate debts and liabilities of IUMRS.

D. IUMRS shall not accept liability for any personal loss, damage, or accident sustained by an individual, not being an employee of IUMRS, while engaged in any activity, including travel, on behalf of IUMRS or of any Member.

E. IUMRS is prohibited from making any representation or commitment, financial or otherwise, in the name of any Member without the written consent of that Member.

F. IUMRS shall not accept liability resulting from actions or obligations made independently by any Member.

VIII. Dissolution of IUMRS

IUMRS shall not be dissolved except on a motion presented at a meeting of the General Assembly. A two-thirds majority vote based on the total voting power of all Adhering Bodies, whether or not participating, is required for dissolution. In the event of dissolution of IUMRS, net assets will be divided among current Adhering Bodies in proportion to their Category of Participation.

IX. Amendments to the Statutes

Amendments to the Statutes can be made by the General Assembly. A two-thirds majority of the total voting power of all Adhering Bodies participating in the meeting of the General Assembly, whether directly or by proxy, is required for adoption.

X. Bylaws

The General Assembly may enact and subsequently amend, by a majority of the total voting power of all Adhering Bodies participating in the meeting of the General Assembly, whether directly or by proxy, regulations or bylaws to administer IUMRS.

XI. Legal Forms, Duration, Domicile, Language, Seat

A. IUMRS is organized under the name International Union of Materials Research Societies. It is governed by the laws of the legal domicile of IUMRS and the present Statutes.

B. The duration of IUMRS is not limited.

C. The legal domicile of IUMRS is Pittsburgh, Pennsylvania, United States of America. A change in legal domicile must be approved by a majority of the total voting powers of all Adhering Bodies, whether or not participating in the meeting where the question arises.

D. English is the official language of IUMRS. The English text of records shall be considered the official and binding records of IUMRS.

E. The Seat of IUMRS shall be the place of formal incorporation of IUMRS.

Revised Statutes, August 29, 2001
Amendments approved by action of the General Assembly, June 11, 2002.
Statutes verified without change July, 2006. Statutes revised, June 11, 2014, by General Assembly, Taipei.
Current draft: proposed and approved at General Assembly 25 October 2015.

INTERNATIONAL UNION OF MATERIALS RESEARCH SOCIETIES (IUMRS)
BYLAWS
Approved at the IUMRS Annual General Assembly, Korea, 25 October, 2015

1. General Assembly

1.1

The agenda of business to be transacted at the Annual General Assembly meeting shall be prepared by the Executive Council and shall be announced by the Secretary or his/her representative to the Members of the General Assembly and the Commissions at least one month before the meeting. A majority of the voting power present may amend the agenda during the meeting (Statutes Article V.B.7). The agenda for interim meetings of the General Assembly called by the Executive Council will be specified by the Secretary and announced as early as practicable. (See Appendix A to these Bylaws)

1.2

Any Commission, Adhering Body, Professional Associate, o r Affiliated Organization of IUMRS in good standing may propose business to be transacted at an Annual General Assembly meeting. Proposals shall reach the Secretary or his/her representative at least five weeks prior to the meeting, and shall be included in the agenda of the meeting. During the meeting, motions can be made by any delegate including a delegate acting as the presiding officer of the General Assembly. A specific motion may be proposed by a non-voting participant in the meeting, but the motion must be formally made by a delegate in order to be put to a vote.

1.3

The Annual General Assembly meeting shall normally be held at the site and time of an international conference hosted by an Adhering Body. The General Assembly sets the time and place for the next annual meeting.

1.4

Chairpersons of Commissions need not be delegates from an Adhering Body. They may not vote in the General Assembly, unless they are also serving as delegates, and exercising the individual voting rights allocated by their respective Adhering Bodies.

1.5

At the invitation of the President, individuals who are not delegates may be invited to address the General Assembly, may participate in discussions, but shall have no voting power.

1.6

Delegates representing each Adhering Body are determined by the governance of the Adhering Body. A proxy is in order when an Adhering Body in good standing sends no delegate to the Annual General Assembly meeting and notifies the IUMRS Secretary in writing to whom its proxy is granted, and of any limitations with respect to questions on which the proxy may be exercised. The person to whom a proxy is granted must already be a delegate to the meeting and must announce that proxy role to the General Assembly before the meeting proceeds to other business.

1.7

Each Adhering Body shall notify the Secretary or his/her representative of its intention to be represented, at least four weeks prior to the meeting of the General Assembly, in order to assist the prediction of achieving a quorum.

1.8

The number of delegates representing an Adhering Body is subject to limitations set by the General Assembly, but the total number of votes (voting power) for each Adhering Body is determined by that Adhering Body's chosen Category of Participation, which is less than or equal to its highest approved Category of Participation, and by Article II.A.5a of the Statutes. The highest approved Category of Participation for an Adhering Body must be consistent with its current level of activity. Such activity shall be assessed on the basis of (i) the vitality and impact of its service to the local and global materials communities; and (ii) its effective participation in IUMRS activities, governance and outreach. Such an evaluation shall be based on the record of the prior three year period.

1.9

Application for adherence to IUMRS is made to the Executive Council through the Secretary or his/her representative and should provide background information on the candidate's activities and relevance to IUMRS objectives. Applications should specify the category of participation desired. The Executive Council will refer the application to a Membership Affairs Commission for evaluation and recommendation. If the application is in conformance with the Statutes of the IUMRS (Article II.B.), the proposal for adherence is referred to the General Assembly. Proposals for adherence have priority over all other business of the General Assembly. Adherence is conferred by an absolute majority of the total voting power of all Adhering Bodies in good standing, whether or not participating in the meeting when the vote is taken.

1.10

Delegates of an Adhering Body may not vote on any matter concerning its own individual membership in the IUMRS. A delegate holding the proxy of an Adhering Body may not exercise that proxy on matters concerning the membership of the proxy-granting Adhering Body.

1.11

All minutes, once reviewed by those who participated in the meeting for accuracy and completeness, and after appropriate corrections have been made, as attested by the Secretary, shall become part of the official archives of the IUMRS. Minutes of all meetings shall be made available to members through the IUMRS web site and minutes collected throughout the year will be formally accepted by the General Assembly at its next Annual Meeting. Any dissenting views received within 30 days after the date of acceptance may be appended in the formal record.

2. Executive Council

2.1

The Executive Council shall meet in conjunction with and at the location of each Annual General Assembly.

2.2

In addition to the meeting required by paragraph 2.1, meetings of the Executive Council will normally be held via the most expeditious means, whether in person or by telephone conference call, or by email. Formal votes may be made by conference call or postal vote or other electronic means. (See Appendix A to these Bylaws) Such meetings and votes will be documented in minutes of the meetings as called for by paragraph 2.9 below.

2.3

The Executive Council shall prepare the agenda for the Annual General Assembly meetings (see paragraph 1.1).

2.4

In the event of the resignation, death or disability of the President, the First Vice-President shall assume the office of President for the remainder of the unexpired term of the President and subsequently ascend to the presidency as scheduled. If the presidential term was not due to expire until the end of the year following the year in which the next Annual General Assembly occurs, then an election to fill the unexpired term of the First Vice President will be held, however that foreshortened term will not carry with it the right to automatically ascend to the presidency. In the event of the resignation, death or disability of the First Vice-President, the Executive Council may, paragraph 2.5 notwithstanding, appoint one of its members to act as First Vice-President, without the right of ascension to the presidency, until the close of the next Annual General Assembly where an election to fill the unexpired vice-presidential term will be held. If the term of the former First Vice President was due to expire at the end of the year in which the Annual General Assembly occurs, then an election for both First Vice President and President will be held. In the event that the Secretary or Treasurer cannot carry out his/her duties, the Executive Council shall appoint a delegate from the General Assembly to complete the term of office of the incumbent. Until the Executive Council has made such an appointment, the Treasurer or Secretary, respectively, shall carry out the duties of the vacant office.

2.5

No individual may hold simultaneously more than one office on the Executive Council.

2.6

The President on his/her own initiative or at the request of the Executive Council, may invite any individual to be present at a meeting of the Executive Council; such an invited guest may take part in the discussions but shall have no voting power.

2.7

A quorum of the Executive Council shall consist of four of the six officers, and decisions shall be decided by a majority vote of those participating. All officers have an equal vote. In the event of a tie vote, the issue shall be decided only by vote of all six officers. In this case, at least four votes in favor is required for passage of a motion. When a vote of the Executive Council fails to decide a question, any officer may bring the question to any General Assembly meeting, with sufficient advance notice, for resolution.

2.8

The Executive Council is responsible for overseeing and directing the relationship between IUMRS and its Partner Members through a Commission on Membership Affairs and IUMRS executive staff as required. Each Professional Associate and Affiliated Organization will receive copies of agendas, minutes and attachments relating to IUMRS General Assembly Meetings. Partner Members are eligible for benefits, including receiving all IUMRS publications and prominent listings in appropriate IUMRS publications as well as at the IUMRS web site. Applicable benefits may be determined from time to time by the Executive Council.

2.9

The Secretary shall be responsible for keeping minutes of Executive Council meetings. After review for accuracy and approval by the Executive Council, these minutes shall be posted at a restricted section of the IUMRS web site and made available upon request to the IUMRS Secretary.

2.10

The Executive Council may create volunteer or paid executive staff positions charged with the execution of explicitly defined aspects of the day to day business of the Union.

3. President and First Vice-President

3.1

The IUMRS President is the chairperson of both the Executive Council and the General Assembly of IUMRS and normally chairs their meetings. In the absence of the President, the first Vice-President may assume those and other duties of the President. However, a majority of participants of either meeting may designate any officer or member's delegate to act as the temporary chairperson for any portion of their meeting.

3.2

The President is an ex officio member of all Commissions. The President may delegate this function to an Officer, at his/her discretion.

3.3

The Second Vice President shall actively participate in the work of the Executive Council, and may accept delegation by the President as an ex officio member of one or more Commissions.

4. Secretary

4.1

The IUMRS Secretary serves as secretary of both the Executive Council and the General Assembly of IUMRS. In the absence of the Secretary, the President shall designate another member of the Executive Council to serve temporarily as Secretary.

4.2

The Secretary is an ex officio member of all Commissions.

4.3.

The Secretary, directly or through his/her representative, is responsible for recording the official proceedings and formal decisions of the Executive Council and the General Assembly, with the exception of the financial admin-

istration, and for insuring proper retention and custodial arrangements for their records.

5.Treasurer

5.1

The Treasurer, directly or through his/her representative, is responsible for overseeing the financial administration of the IUMRS and for overseeing the keeping of all financial records and accounts.

5.2

The Treasurer is an ex officio member of all Commissions.

5.3

The Treasurer, directly or through his/her representative, shall prepare an annual, written financial report for the delegates of the General Assembly. Discussion of the financial report will be placed on the agenda of at least one meeting of the General Assembly prior to the end of each calendar year.

5.4

The fiscal year shall begin on January 1 of each year and end on December 31 of the same year.

5.5

Membership fees of each Adhering Body, as determined by its Category of Participation (Article III.A.5a of the IUMRS Statutes), are due on January 1 of each year. Payment of the fee entitles the Adhering Body to membership in IUMRS for that calendar year. Late payments will not be prorated unless the Adhering Body is joining IUMRS part way through the current year. Only after full payment has been received by IUMRS may the Adhering Body cast any votes in General Assembly meetings or elections, or receive other member benefits and services.

6. Commissions

6.1

The Executive Council is responsible for the establishment and oversight of Commissions having functions integral to the work of IUMRS. (See Statutes, Articles V.B.5 & 6 and V.C.1-4)

6.2

The Chairperson of each Commission shall be appointed by the Executive Council. Members of Commissions shall be appointed by the Executive Council for two year terms which may be renewed. Each Commission Chairperson shall be regarded as a non-voting ex officio member of the Executive Council.

6.3

Each Adhering Body is entitled, if it wishes, to designate one representative as a member of each Commission.

6.4

Each Commission should be composed of members who, as far as practical, represent the full range of Adhering Bodies and their scientific disciplines as well as members who bring with them necessary expertise and who need not be affiliated with an IUMRS Adhering Body.

6.5

The Chairperson of each Commission shall report annually to the Executive Council and the General Assembly on the activities of the Commission.

6.6

The budget for the activities of the Commission will be allocated by the Executive Council. The Chairperson of the Commission shall submit an annual financial report on the expenditure of these funds to the Treasurer or his/her representative.

6.7

The term of a Chairperson shall be two years, and no person may serve more than two consecutive terms as Chairperson of the same Commission without approval of an exception by the Executive Council. No person may serve as a member of a Commission for more than three consecutive terms without approval of an exception by the Executive Council.

6.8

In the event of the resignation, death or disability of the Chairperson of a Commission, the Executive Council shall appoint a new Chairperson, whose term begins with his/her appointment.

6.9

If in the sole judgement of the Executive Council, a Chairperson fails to fulfill the duties required of the position, he or she may be replaced by the Executive Council.

6.10

The explicit duties and responsibilities of each Commission will be determined by the Executive Council, and they will be published in various forms, including the IUMRS web site.

7. Nomination and Election of Officers

7.1

Election of the officers shall occur at the Annual General Assembly prior to the calendar year in which their two-year terms of office begin on January 1. If for unforeseen circumstances that meeting cannot be held, an election using emailed or postal ballots will be held.

7.2

The Executive Council shall submit nominations to the General Assembly for the officer positions of IUMRS. The Executive Council shall solicit nominations by polling all Adhering Bodies for nominations of candidates for each office to be filled, either directly or through a Nominations Commission that may also identify additional candidates by other means. The slate of candidates for officers should, as far as is practical, be selected so that, over a few years, the ensemble of nominees is representative of the full range of IUMRS Adhering Bodies and their scientific disciplines.

7.3

Each nomination must be accompanied by a brief statement of the qualifications of the nominee for office, (which may include a policy statement by the nominee).

7.4

No officer, except the Secretary or Treasurer, may be nominated to succeed himself or herself for the same office. The Secretary and the Treasurer may succeed themselves for only one additional term of office.

7.5

The Executive Council must notify all Adhering Bodies and their designated delegates of the nominations for each office at least five weeks prior to the session of the General Assembly in which the election will be held.

7.6

The full slate of candidates for each office, together with statements of their qualifications, shall be posted by the Secretary or his/her representative four weeks before the meeting of the General Assembly at which the election of officers will be held.

7.7

The election of officers shall be governed by the same rules of quorum, proxy representation and voting power as those defined in the Statutes for all General Assembly actions. The IUMRS Secretary, after consulting the IUMRS Treasurer or his/her representative regarding payment of fees, shall confirm the voting power of each Adhering Body in good standing before any votes are cast.

7.8

In voting, each of the offices shall be taken separately and in the sequence: First Vice-President, Second Vice-President, Secretary and Treasurer. Voting shall be by secret ballot. An absolute majority of the total voting power represented by all Adhering Body delegates participating in the meeting shall be required for election. Each Adhering Body may cast from none to its maximum number of votes based on voting power. If on the initial balloting no candidate achieves an absolute majority, the procedure required by paragraph 7.9 below shall be followed. Voting by proxy is permitted. An Adhering Body represented by proxy shall be considered a participant in the meet-

ing. An Adhering Body with voting power greater than one may divide its votes among candidates at its discretion. Fractional votes are not permitted.

7.9

In the event a candidate for each office does not attain an absolute majority of total voting power represented by all Adhering Body delegates participating in the meeting, a second secret ballot shall be taken between the two nominees with the highest number of votes cast. This procedure shall be repeated until a single nominee has been elected for each office by an absolute majority of total voting power represented by all Adhering Body delegates participating in the meeting or until the presiding officer determines that an unresolvable deadlock has occurred. If such a deadlock should persist for an office beyond January 1 of the coming year, despite additional post-meeting electronic balloting, the IUMRS President may appoint a temporary office holder until subsequent balloting succeeds in filling that office.

7.10

No more than two Officers who were originally nominated for election by the same Adhering Body may serve concurrently.

7.11

In the event that a currently serving officer appears on the slate of candidates for another office, the Executive Council shall also have solicited a provisional nomination for the office which would be vacated if the election to the other office occurs. If the election to the other office does not occur and if the officer's term has not expired, the provisional nomination to the office which would have been vacated shall not be considered.

7.12

Any parliamentary contingency arising during the balloting shall be resolved by a ruling of the presiding Officer, after consultation with the Parliamentarian, if a Parliamentarian has been appointed. This ruling shall be final.

8. Bylaws

8.1

The Bylaws may be amended by an absolute majority vote of the votes allocated to those Adhering Bodies participating, physically or electronically, in a General Assembly meeting where the amendment motion is considered, whether or not those votes are cast.

8.2

The present English text shall be considered the authoritative text in the interpretation of these Bylaws. In disputes concerning the interpretation of the Bylaws that remain unresolved after appealing to the IUMRS Statutes for clarification, the matter shall be decided by the General Assembly with a vote as described in paragraph 8.1, or during the periods between General Assembly meetings, by a ruling of the President subject to subsequent ratification by the General Assembly at its next meeting.

8.3.

The language of the Bylaws shall not be used to restrict in any way the participation of any person in the affairs and activities of the IUMRS on the basis of gender, race, religious affiliation, or nationality.

9.Financial Expenditure Procedures

Every expenditure of IUMRS funds must be appropriately identified with a specific expenditure item or category that appears in the prevailing IUMRS budget most recently approved by the General Assembly.

Each IUMRS budget will contain an allocation intended to enable IUMRS to proceed with reasonable expenditures for unanticipated needs that may arise during the year. This "contingency" allocation will constitute a maximum total amount available for all unbudgeted expenditures over the entire year, without specific new approval by the Executive Council.

The Treasurer, or his/her representative, will receive and implement payment requests from Officers, Commission Chairs, and external suppliers that are consistent with the current budget and are documented with correspond-

ing procurement authorizations and receipts as appropriate. The Executive Council will officially determine a level of single expenditure that requires, in addition to a single signature or electronic approval on a disbursement order, the specific concurrence of a designated Officer.

10. Relationships between Adhering Bodies: Mutual Courtesy

IUMRS expects that all Adhering Bodies will maintain cooperative relationships with each other in matters in which one Adhering Body's interests and activities may impact the activities or interests of another Adhering Body. Such possibilities could arise in relation to, but not limited to, technical meetings, publications, membership activities, and collaborations with other organizations, including those that may be affiliated with IUMRS. When appropriate and practical, collaboration is strongly encouraged. Timely advance notice of plans for such events and activities is expected.

11. Responsibilities and Performance Requirements for Officers and Commission Chairs

11.1

Election of Officers assumes their personal commitment to diligence in discharging their responsibilities. All are expected to provide timely communication, including email discussions, phone conferences, and voting. Officers are expected to participate consistently in all activities of the Executive Council and General Assembly. Failing that, the General Assembly may vote to remove a non-performing officer and replace him/her according to procedures specified in paragraph 2.4.

11.2

Appointment of Commission Chairs assumes their personal commitment to diligence in discharging their responsibilities. All are expected to provide timely communication related to the activities and plans of their commissions. Failing that, the Executive Council may appoint a replacement for a non-performing chairperson.

IUMRS BYLAWS

APPENDIX A

Protocols for Electronic Interim Meetings of the IUMRS Executive Council and IUMRS General Assembly

1. Electronic General Assembly meetings may be held in the period between the Annual Assemblies in order to facilitate the ongoing activity of the Union. Such events must be authorized and scheduled by the Executive Council. The procedure and protocols for such events will preserve the structure and spirit of the in-person annual meetings. Except for procedural details enabling email transactions and dialogue, the powers and voting rules for the electronic meetings will be the same as those applicable for the in-person meetings of the General Assembly.

2. The conduct and procedure for electronic General Assembly (EGA) meetings will be based on the intent, spirit, and structure of Robert's Rules of Order, modified only to enable effective email discussions, formal motions, adequate debate, and electronic voting. Such events will normally extend over a period of days, with clearly announced deadlines for submission of agenda and proposals, opening and closing discussion, presenting precise final text of motions on which to vote, registration of votes, and announcement of results. Application of each Adhering Body's voting power based on its Category of Participation will be identical to its application at in-person General Assembly meetings. Minutes will be recorded by the Secretary, and supported archivally by the total assembly of online exchanges.

3. An electronic General Assembly meeting can be called by the Executive Council with at least two months written notice. The Executive Council should confirm receipt of those notices with each Adhering Body. Motions can be presented to the electronic General Assembly by email or other means, provided that sufficient background information is included in a timely fashion.

4. A quorum for an electronic General Assembly shall be the participation of delegates representing two-thirds of the voting power accorded to all of the Adhering Bodies in good financial standing. The Secretary shall register all individuals who intend to participate in the electronic General Assembly meeting and assemble their email addresses to serve as a distribution list for all subsequent online discussion and voting.

5. The identity of each participant shall be considered confirmed when an exchange of email messages between the Secretary and the prior known address of the participant has occurred. Alternative email addresses shall be confirmed in the same manner.

6. Given that impediments to attendance at in-person General Assembly meetings, such as travel schedules and cost, do not apply to electronic General Assembly meetings, and given the extended time period over which an electronic General Assembly meeting is conducted, designation of proxy representation by an Adhering Body shall not be allowed.