Final Announcement

Call for Papers

ICMAT
2007

International Conference on Materials for Advanced Technologies 2007

Incorporating

GEM^4 Conference on Cancer

www.mrs.org.sg

1 - 6 July 2007, Singapore

Suntec Singapore International Convention and Exhibition Centre

Organised by

MRS
Materials Research Society
SINGAPORE

In association with

NUS National University of Singapore

Institute of Materials Research and Engineering
A*STAR

NANYANG TECHNOLOGICAL UNIVERSITY

HIGHLIGHTS OF PREVIOUS ICMAT

Year 2001

- 1-6 July 2001
- 16 Symposia
- 10 Plenary Lectures
- 4 Public Lectures by Nobel Laureates
- 1,400 Delegates

Year 2003

- 7-12 December 2003
- 16 Symposia
- 9 Plenary Lectures
- 2 Public Lectures by Nobel Laureates
- 1,500 Delegates

Year 2005

- 3-8 July 2005
- 25 Symposia
- 9 Plenary Lectures
- 2 Theme Lectures
- 3 Public Lectures by Nobel Laureates
- 2,200 Delegates

ABOUT THE CONFERENCE

Encouraged by the successes of ICMAT 2001, ICMAT 2003 and ICMAT 2005 at which more than 2,000 members of the international scientific and materials research community representing over 40 countries attended, the Materials Research Society of Singapore will host the 4th ICMAT from 1 to 6 July 2007 at the Suntec Singapore International Convention and Exhibition Centre (SICEC).

In conjunction with this bi-annual conference, the Global Enterprise for Micro-Mechanics and Molecular Medicine (GEM^4), a new paradigm in global interactions among leading institutions to work together seamlessly across the boundaries of science, engineering, technology, medicine and public health, will also hold its first Conference on Cancer.

There will be 18 Symposia covering contemporary topics of importance for the science, engineering and technology of materials. The technical program includes Plenary, Keynote, Invited, Oral and Poster presentations. More than 50 international exhibitors from all sectors of materials science and engineering communities will also be showcasing their products and equipment during the conference.

In keeping with the previous ICMAT conferences, a few Nobel Laureates will speak at the conference. Some of the Nobel Laureates who are invited to give plenary lectures at the conference will also be giving public lectures at the University Cultural Centre of the National University of Singapore. These lectures will be opened to conference participants and to the general public including students from local Junior Colleges, Polytechnics and Universities.

Thus, ICMAT 2007 will be a multidisciplinary forum providing over 2,000 research scientists and engineers a first-hand learning platform, as well as the opportunity to share and exchange ideas with some of the best minds in the field. The organization of the GEM^4 Conference on Cancer provides further possibility for interaction with the medical researchers.

CALL FOR PAPERS

Authors are invited to submit their abstract(s) electronically via the conference website at: **www.mrs.org.sg** by **31 January 2007**.

- Please note that fax or email submissions will not be accepted.
- In fairness to all potential authors, late submissions will not be accepted.

PLENARY LECTURES

Anthony K. CHEETHAM
International Center for Materials Research
University of California Santa Barbara, USA
"Hybrid Inorganic-Organic Materials and their Applications"

Claude COHEN-TANNOUDJI
Nobel Laureate in Physics
Laboratoire Kastler Brossel
Departement de Physique de l'ENS, FRANCE
"Manipulating Atoms with Light"

Richard H. FRIEND
Cavendish Laboratory
University of Cambridge, UK

Theodor W. HAENSCH
Nobel Laureate in Physics
Max-Planck-Institut für Quantenoptik, GERMANY
"Towards a Quantum Laboratory on a Chip"

H. Robert HORVITZ
Nobel Laureate in Physiology
Massachusetts Institute of Technology, Cambridge, USA
"Cell Suicide: Programmed Cell Death in Development and Disease"

Sumio IIJIMA
Meijo University & AIST/Research Center for Advanced Carbon Material, JAPAN
"Nano-carbon Materials: Their Fundamentals and Various Applications including Nano-biotechnology"

R. Stanley WILLIAMS
Hewlett-Packard Laboratories, USA
"Computing at the Nanoscale will Employ Different Physics and Logic Operations"

THEME LECTURES

Martin JANSEN
Max-Planck Institute for Solid State Research, Stuttgart, Germany
"Synthesis Planning in Solid State and Materials Chemistry"

S. MOHAN
Indian Institute of Science, Bangalore, India
"Role of Multidisciplinary Materials Research in Technology Creation and Commercialisation"

Pankaj VADGAMA
IRC in Biomedical Materials
Queen Mary, University of London, UK
"Designer Surfaces for the Biological Interface – How Far can we Enhance Functional Performance?"

SCHEDULE AND DEADLINES

Receipt of Abstracts	31 January 2007	***Registration at Standard Rates***	2 April - 15 June 2007
Acceptance of Abstracts	15 March 2007	***Online Registration Closes***	16 June 2007
**** Receipt of Manuscripts***	1 May 2007	***Registration at Onsite Rates***	from 16 June 2007
Registration at Reduced Rates	1 April 2007		

** The submission deadlines for manuscripts may differ for different symposia. Please refer to the website for details*

REGISTRATION FEES *[Rates quoted are in Singapore Dollars (SGD). USD1 is approximately SGD 1.6]*

Category	Early Bird *(on or before 1 Apr 07)*	Standard *(2 Apr - 15 Jun 07)*	Onsite *(from 16 Jun 07)*
Delegate - Non Member	$850.00	$900.00	$1,000.00
Delegate - MRS (S) Member	$750.00	$800.00	$900.00
Student / Premier Sponsors *	$500.00	$550.00	$600.00

** The Student / Premier Sponsors' registration category is applicable to all full-time students and participants from organizations who are premier sponsors at ICMAT 2007. The secretariat will verify the identification of the registrant before confirmation of registration.*

All full-paying delegates are entitled to:

- Admission to All Technical Sessions
- Admission to All Public Lectures
- Admission to Exhibition
- Daily Coffee Breaks and Lunch
- Program Book
- Abstracts Book (of the PRIMARY symposium registered)
- Abstracts – CD ROM Compilation of all symposia
- MRS Singapore Membership (2 years - valid from 1 Jul 2007 to 30 Jun 2009)
- Proceedings (of the PRIMARY symposium registered as and when it is published)

ACCOMMODATION *[Rates quoted are in Singapore Dollars (SGD). USD1 is approximately SGD 1.6]*

The list of recommended hotels is as follows (online reservation will open from February 2007):

Hotel	Rates	
	Single	Twin
Pan Pacific Hotel	$295 nett	$335 nett
Grand Copthorne	$270 nett	$300 nett
Grand Plaza Parkroyal	$235 nett	$255 nett
Orchard Hotel	$235 nett	$265 nett
Plaza Parkroyal	$220 nett	$240 nett
Copthorne Kings Hotel	$220 nett	$240 nett
New Park Hotel	$180 nett	$190 nett
Allson	$165 nett	$180 nett
City Bayview	$145 nett	$155 nett
Summerview	$130 nett	$130 nett
Hotel 81 Bencoolen*	$110 nett	$110 nett

- *Online reservations only. Please refer to the website for details on hotel location, payment procedure and cancellation policy.*
- *Rates listed above are inclusive of daily breakfast (* except for Hotel 81 Bencoolen)*
- *Rates are correct at time of publication but may be subjected to change depending on availability of rooms*
- *Hostel accommodation available, details will be posted on the website in February 2007*

CONFERENCE VENUE

Suntec Singapore International Convention & Exhibition Centre
1 Raffles Boulevard, Suntec City Singapore 039593
Visit http://www.suntecsingapore.com/ for location map.

SYMPOSIA DETAILS

(A) ADVANCED FUNCTIONAL BIOMATERIALS

Chair **YANG Yi-Yan,** *Institute of Bioengineering and Nanotechnology, Singapore*
31 Biopolis Way, The Nanos, #04-01, Singapore 138669
Tel: (65) 6824 7106, Fax: (65) 6478 9084, Email: yyyang@ibn.a-star.edu.sg

Co-Chairs **WANG Shu,** *Institute of Bioengineering and Nanotechnology, Singapore*
Subbu S VENKATRAMAN, *Nanyang Technological University, Singapore*
Kazunori KATAOKA, *University of Tokyo, Japan*
PARK Tae Gwan, *Korea Advanced Institute of Science and Technology, Korea*

Design of novel biomaterials with specific functions has recently attracted significant attention from researchers in the areas of materials science, bioengineering and biomedicine. This symposium is aimed to give participants an update of the latest discoveries and progresses of the science and application of functional biomaterials. It will cover synthetic functional polymers/inorganic materials, organic/inorganic hybrid materials, nuclei acids and peptides as well as natural biomaterials for drug/gene delivery, bio-imaging, tissue engineering and stem cell research.

Keynote Speakers ***(Partial/Tentative)***
Ruth DUNCAN, *Cardiff Univ., UK*
James L. HEDRICK, *IBM Research, USA*
Kazunori KATAOKA, *The Univ. of Tokyo, Japan*
Kam W. LEONG, *Duke Univ., USA*
Jackie Y. YING, *IBN, Singapore*

Invited Speakers ***(Partial/Tentative)***
Simon COOL, *IMCB, Singapore*
Andrew J. T. GEORGE, *Imperial College, UK*
Hans GRIESSER, *Univ. of South Australia, Australia*
Jons HILBORN, *Uppsala Univ., Sweden*
LUO Dan, *Cornell Univ., USA*
PARK Tae Gwan, *KAIST, Korea*
PHAN Toan Thang, *NUS, Singapore*
TONG Yen Wah, *NUS, Singapore*
WANG Shu, *IBN, Singapore*
ZHANG Shuguang, *MIT, USA*

(B) DEVELOPING NANO-BIO INTERFACE

Chair **LOH Kian Ping,** *National University of Singapore, Singapore*
Department of Chemistry, 3 Science Drive 3, Singapore 117543
Tel: (65) 6516 4402, Fax: (65) 6779 1691 Email: chmlohkp@nus.edu.sg

Co-Chairs **Andrew WEE Thye Shen,** *National University of Singapore, Singapore*
SEERAM Ramakrishna, *National University of Singapore, Singapore*
LI Jun, *Institute of Materials Research and Engineering, Singapore*
Federico ROSEI, *University du Quebec, Canada*

The scope of the symposium covers topics related to the inter-disciplinary areas of nano-biotechnology. Biological systems are without doubt the most successful examples of integrated functional nanosystems. A successful integration of biological functionality with devices requires control of the nano-bio interface. This symposium is intended for the dissemination of the recent development in these areas. Topics that will be covered include: Bioelectronics on a semiconductor platform; Nanotechnology for Bioanalysis and Biomedical applications; Immobilization and applications of functional proteins, nucleic acids and cells on solid interfaces; Nanoprobe manipulation and characterization of biomolecules and cells; Nanofluidics for bioanalysis; MEMS based on bio-nano interface.

Keynote Speakers ***(Partial/Tentative)***
Fleming, BESENBACHER, *Univ. of Aarhu, Denmark*
James KIRKPATRICK, *Johannes Gutenberg Univ., Germany*
Wolfgang KNOLL, *Max-Planck-Institut fur Polymerforschung, Germany*
V. RENUGOPALAKRISHNAN, *Harvard Medical School, USA*

Invited Speakers ***(Partial/Tentative)***
CHANG H. C., *Academia Sinica, Taiwan*
CHENG C.-L., *National Dong Hwa Univ., Taiwan*
DAI Liming, *Univ. of Dayton, USA*
Cecile FRADIN, *McMaster Univ., Canada*
Tadahisa IWATA, *RIKEN Institute, Japan*
Nesladek MILOS, *CEA, France*
Ron NAAMAN, *Weizmann Institute, Israel*
Antonio NANCI, *Univ. of Montreal, Canada*
Christopher E. NEBEL, *AIST, Japan*
Andrew E. PELLING, *Univ. College London, UK*
TONG Zhen, *South China Univ. of Technology, China*
Enrico TRAVERSA, *Univ. of Rome, Italy*
Andrew WAN, *IBN, Singapore*
WANG Min, *The Univ. of Hong Kong, China*

SYMPOSIUM C: BIO FUNCTIONAL MATERIALS: FROM UNDERSTANDING TO DESIGN

Chair **LIU Xiang Yang,** *National University of Singapore, Singapore*
Department of Physics, 2 Science Drive 3, Singapore 117542
Tel: (65) 6516 2812, Fax: (65) 6777 6126, Email: phyliuxy@nus.edu.sg

Co-Chairs **FENG Si-Shen,** *National University of Singapore, Singapore*
TAO Xu-Tang, *Shandong University, China*
YAN Jie, *National University of Singapore, Singapore*

Many biological materials reveal superior functionalities that have become increasingly important in modern sciences and technologies. How we can learn from nature by mimicking highly sophisticated biological systems in order to identify robust technologies and to improve human health has become one of the key challenges in the 21st century. This symposium will focus on two aspects of designing such modern materials: (1) how the very particular structures of these biomaterials form under the influence of some specific biomaterials; and (2) how we can manipulate these structures in order to create new materials with superior functionalities. The subjects to be covered range from biomolecular interaction and assembly, biofunctional surfaces and their applications, bio materials for cancer nanotechnology, nanomaterials for medical imaging, to the *formation dynamics and design of* ultra functional biomaterials, tissue engineering, etc. We hope to address these issues from both the fundamental and application points of view.

Invited Speakers ***(Partial/Tentative)***
Robert A. BROWN, *Royal National Orthopaedic Hospital, UK*
Julio A. CAMARERO, *Lawrence Livermore National Laboratory, USA*
J. J. DE YOREO, *Lawrence Livermore National Laboratory, USA*
DU Ning, *NUS, Singapore*
FENG Si-Shen, *NUS, Singapore*
GU Hongchen, *Shanghai Jiaotong Univ., China*
HAN Mingyong, *NUS, Singapore*
LI Daiqin, *NUS, Singapore*
LIM Chee Teck, *NUS, Singapore*
LIU Xiang-Yang, *NUS, Singapore*
LU J., *Manchester Univ., UK*
Alexander J. MALKIN, *Lawrence Livermore National Laboratory, USA*
Kiyotaka SATO, *Graduate School of Biosphere Science, Japan*
SONG Jianxing, *NUS, Singapore*
Peter G. VEKILOV, *Univ. of Houston, USA*
XIONG Junying, *NUS, Singapore*
YAN Jie, *NUS, Singapore*
ZHANG Xingdong, *Sichuan Univ., China*
ZHAO Xiaojun, *Sichuan Univ., China*

SYMPOSIUM D: SEMICONDUCTOR PHOTONICS: NANO-STRUCTURED MATERIALS AND DEVICES

Chair **Soo Jin CHUA,** *Institute of Materials Research and Engineering, Singapore*
3 Research Link, Singapore 117602
Tel: (65) 6874 8377, Fax: (65) 6872 0785, Email: elecsj@nus.edu.sg

Co-Chairs **Jinghua TENG,** *Institute of Materials Research and Engineering, Singapore*
Osamu WADA, *Kobe University, Japan*
Richard DE LA RUE, *University of Glasgow, UK*
Xiaohong TANG, *Nanyang Technological University, Singapore*

Nanoscale structures made of semiconductors show unique properties and open new avenues for photonics. This symposium will bring together researchers working on semiconductor photonics to discuss the most recent development in the growth or synthesis of materials, the fabrication of devices with optical properties determined by nano scale features, and the simulation and characterization of these nano-structured materials and devices. Topics include but are not limited to: Quantum dots, wires, wells, rods and other quantum confined system; Self-assembled and patterned nano-structured material growth or synthesis; Photonic crystals: modeling, fabrication, characterization and device application; Nano scaled photonic devices, e.g. LD, LED, detector, photovoltaic and waveguide devices; Si photonics; ZnO light emitting structures and devices; Novel photonic materials and devices; Modeling and simulation of nano-structured materials and devices; Nano-scale spatial-resolved characterization; Quantum and nonlinear optics in nano-structures; Light matter interactions in micro-nano-cavities

Invited Speakers ***(Partial/Tentative)***
Richard DE LA RUE, *Univ. of Glasgow, UK*
Didier DECOSTER, *IEMN, CNRS, France*
Eugene A. FITZGERALD, *MIT, USA*
HO Seng-Tiong, *Northwestern Univ., USA*
Colin HUMPHREYS, *Cambridge Univ., UK*
Chennupati JAGADISH, *Australia National Univ., Australia*
Alois KROST, Otto-von-*Guericke Univ. Magdeburg, Germany*
LI Zhi Yuan, *Chinese Academy of Science, China*
LIU H. C., *Institute for Microstructural Sciences, Canada*
LUO Yi, *Tsinghua Univ., China*
Susumu NODA, *Kyoto Univ., Japan*
Charles TU, *Univ. of California San Diego, USA*
Osamu WADA, *Kobe Univ., Japan*
XU Shi Jie, *Univ. of Hong Kong, China*

SYMPOSIUM E: NANODEVICES AND NANOFABRICATION

Chair **Wei ZHOU,** *Nanyang Technological University, Singapore*
Precision Engineering & Nanotechnology Centre
50 Nanyang Avenue, Singapore 639798
Tel: (65) 6790 4700, Fax: (65) 6791 1859, E-mail: MWZhou@ntu.edu.sg

Co-Chairs **Chun LU,** *Institute of High Performance Computing, A*Star, Singapore*
Bill MILNE, *University of Cambridge, UK*
Zhong Lin WANG, *Georgia Institute of Technology, USA*
Qing ZHANG, *Nanyang Technological University, Singapore*

A variety of devices at nanometer scale / molecular scale for electronic, photonics, optoelectronics, biological and mechanical applications have been created through a rapid development of materials and fabrication technology. Further development of such devices strongly depends on the state-of-the-art knowledge of science and technology at the sub-100nm length scale. The objective of this symposium is to present up to date and highlights some of the key advances in the following topics: Electronic and optoelectronic devices of nanometer scale / molecular scale; Nanomechanics and NEMS; Electromechanical coupled devices; Manipulation and aligning processes at nanometer scale / molecular scale; Quantum phenomena; Modeling of nanodevices and

nanostructures; Fabrication and property characterization of nanodevices; Nanofabrication with focused beam technology, e.g., focused ion beam, laser and proton beam.

Invited Speakers ***(Partial/Tentative)***
Michael J. AZIZ, *Harvard Univ., USA*
Ray H. BAUGHMAN, *Univ. of Texas at Dallas, USA*
James R. Von EHR II, *Zyvex Corporation, USA*
Byoungho LEE, *Seoul National Univ., South Korea*
Nicola MARZARI, *MIT, USA*
Cengiz S. OZKAN, *UC Riverside, USA*
Federico ROSEI, *Univ. of Quebec, Canada*
Siegfried SELBERHERR, *Technische Universitaet Wien, Austria*
Donglu SHI, *Univ. of Cincinnati, USA*
Jean-Marc THEVENOUD, *Alcatel Micro Machining Systems, France*
Yonhua TZENG, *Cheng Gong Univ., Taiwan*
Shuyan XU, *NTU, Singapore*
Chia-Hung YANG, *Univ. of Maryland, USA*
Yong-Hang ZHANG, *Arizona State Univ. , USA*
Jing ZHU, *Tsinghua Univ., China*

SYMPOSIUM F: MICROSTRUCTURED AND NANOSTRUCTURED OPTICAL FIBERS

Chair **SHUM Ping,** *Nanyang Technological University, Singapore*
Network Technology Research Centre
Research Techno Plaza, 50 Nanyang Drive, Singapore 637553
Tel: (65) 6790 4217, Fax: (65) 6792 6894, Email: epshum@ntu.edu.sg

Co-Chairs **LU Chao,** *Nanyang Technological University, Singapore*
John LOVE, *Australian National University, Australia*
Jonathan C. KNIGHT, *University of Bath, UK*

Being able to channel light has flourished communications technology, and will possibly contribute to the much-anticipated optical computing technology. This symposium is dedicated to microstructured optical fibers (MOFs) with their cross-sectional features in micrometer or sub-micrometer scale, and dielectric wires in nanometer scale (nanowires). Apart from MOFs and nanowires, we also encourage discussions on: 1) specialty fibers which are in a form closer to conventional step-index fiber but with extraordinary optical properties (e.g., single-polarization fibers), and 2) longitudinally-invariant planar optical waveguides, due to similar physics involved. Both theoretical and experimental investigations of the above-mentioned waveguides, in fields like linear/nonlinear optics, amplification systems, sensing, high-power systems etc, will be covered.

Invited Speakers ***(Partial/Tentative)***
Thomas T. ALKESKJOLD, *Technical Univ. of Denmark, Denmark*
Géraud BOUWMANS, *Laboratoire Phlam, France*
Kin-Seng CHIANG, *City Univ. of Hong Kong, China*
FU Libin, *Univ. of Sydney, Australia*
Claire GU, *Univ. of California, USA*
John HARVEY, *Univ. of Auckland, New Zealand*
KANG Jin U., *The Johns Hopkins Univ., USA*
Jonathan C. KNIGHT, *Univ. of Bath, UK*
Boris KUHLMEY, *Univ. of Sydney, Australia*
Maryanne LARGE, *Univ. of Sydney, Australia*
Jesper LARGSGAARD, *Technical Univ. of Denmark, Denmark*
John LOVE, *Australian National Univ., Australia*
Christine RESTOIN, *Xlim, France*
Roy TAYLOR, *Imperial College London, UK*
TONG Limin, *Zhejiang Univ., China*

SYMPOSIUM G: SCANNING PROBE MICROSCOPY IN MATERIALS RESEARCH

Chair **N. CHANDRASEKHAR,** *Institute of Materials Research and Engineering, Singapore*
3 Research Link, Singapore 117602
Tel: (65) 6874 8586, Fax: (65) 6774 4657
E-mail: n-chandra@imre.a-star.edu.sg, phycn@nus.edu.sg

Co-Chairs **Sean J. O'SHEA,** *Institute of Materials Research and Engineering,Singapore*
Venky NARAYANAMURTI, *Harvard University, USA*
Karl-Heinz RIEDER, *EMPA – Swiss Federal Laboratories for Materials Research, Zurich, Switzerland*

The SPM has become an indispensable tool in physics, chemistry, engineering, and life sciences since the invention of the STM in 1981. We propose a symposium devoted to scanning probe microscopies. The symposium will cover recent advances in scanning probe techniques namely STM, AFM and SNOM.

Keynote Speakers ***(Partial/Tentative)***
Masakazu AONO, *NIMS, Japan*
Richard BERNDT, *Univ. of Kiel, Germany*
J. C. DAVIS, *Cornell Univ., USA*
Maki KAWAI, *Tokyo Univ., Japan*
Gerhard MEYER, *IBM Zurich Research Lab, Switzerland*
Ernst MEYER, *Univ. of Basel, Switzerland*
Seizo MORITA, *Osaka Univ., Japan*
Venky NARAYANAMURTI, *Harvard Univ., USA*

Invited Speakers ***(Partial/Tentative)***
Flemming BESENBACJER, *Univ. of Aarhus, Denmark*
Peter BETON, *Univ. of Nottingham, UK*
Gerald DUJARDIN, *Univ. Paris-Sud, France*
Stefan FOLSCH, *Paul Drude Institute, Germany*
S. GAUTHIER, *CEMES, CNRS, France*
Leonhard GRILL, *Free Univ., Germany*
Masahiko HARA, *Tokyo Institute of Technology and RIKEN, Japan*
S. W. HLA, *Univ. of Ohio, USA*
Christian JOACHIM, *CEMES, CNRS, France*
Young KUK, *Seoul National Univ., Korea*
Jascha REPP, *IBM Zurich Research Lab, Switzerland*
Frederico ROSEI, *Univ. of Quebec, Canada*
Frank RUESS, *Univ. of New South Wales, Australia*
San-Qiang SHI, *Hong Kong Polytechnic Univ., China*
Kar Seng TENG, *Univ. of Wales, UK*
Roland WIESENDANGER, *Univ. of Hamburg, Germany*
Robert WOLKOW, *Univ. of Alberta, Canada*

SYMPOSIUM H: MEMS TECHNOLOGY AND DEVICES

Chairs **Ai-Qun LIU,** *Nanyang Technological University, Singapore*
School of Electrical & Electronic Engineering, 50 Nanyang Avenue, Singapore 639798
Tel: (65) 67904336, Fax: (65) 67920415, Email: eaqliu@ntu.edu.sg

Chun LU, *Institute of High Performance Computing, Singapore*

Co-Chairs **Ajay AGARWAL,** *Institute of Microelectronics, Singapore*
Siak Piang LIM, *National University of Singapore, Singapore*
Poenar Daniel PUIU, *Nanyang Technological University, Singapore*

The emphasis of this symposium is on Microelectromechanical Systems (MEMS) technology and devices. Particularly applications that involve MEMS design, modeling, fabrication processes (e.g. semiconductors, polymers, etc.) lab-on-a-chip, and biophotonic medical devices (e.g. DNA, protein and cell sorting, etc.) are preferred. This symposium will explore new devices and processes innovation and engineering applications, especially related to MEMS technology and devices.

Keynote Speakers ***(Partial/Tentative)***
LIN Liwei, *UC Berkeley, USA*
Kitamori TAKEHIKO, *The Univ.of Tokyo, Japan*

SYMPOSIUM J: MATERIALS FOR ADVANCED SENSORS AND DETECTORS

Chair **Girish M. KALE,** *University of Leeds, UK*
Leeds LS2 9JT, United Kingdom
Tel: (44) 113 3432805, Fax: (44) 113 3432384, Email: g.m.kale@leeds.ac.uk

Co-Chairs **YAO Kui,** *Institute of Materials Research and Engineering, Singapore*
Sheikh AKBAR, *Ohio State University, Columbus, USA*
Manoj GUPTA, *National University of Singapore, Singapore*
Enrico TRAVERSA, *University of Rome, Italy*

Materials from nanoscale to macroscale have a significant role to play in important and ever growing technologically vital areas such as sensors and detectors for environmental and healthcare applications. Sensors and detectors are required to monitor and control processes and actions in wide range of applications. The symposium will try to bring together researchers from disciplines such as physics, chemistry, biochemistry, medicine, analytical science, environmental science, materials science, electronics, automation, instrumentation and engineering to highlight the latest developments and future challenges in this exciting field of research.
The symposium will focus on topics related to Theory and sensing mechanism; Sensor networks, arrays and algorithms; Novel materials for gas sensors, biosensors, radiation detectors, optical devices; Synthesis and characterization of sensor and detector materials; Novel fabrication technologies for thick and thin film devices; Novel nano-structured materials for sensors and detectors; Novel semiconductor materials for sensors and detectors; Novel sensing and detection techniques; Temperature and time dependent characteristics of sensing and detection materials; Sensor and detector packaging materials and technologies; Piezoelectric, ferroelectric and multi-ferroic materials; Integration and applications of smart materials in micro and nano systems.

Keynote Speakers ***(Partial/Tentative)***
Marc MADOU, *Univ. of California, Irvine, USA*
Ivan PARKIN, *Univ. College London, UK*
Joseph SETTER, *SRI International, USA*
Yasuhiro, SHIMIZU, *Nagasaki Univ., Japan*

Invited Speakers ***(Partial/Tentative)***
Chitra AIYER, *Univ. of Pune, India*
Abdul-Majeed AZAD, *Univ. of Toledo, USA*
Elisabetta Di BARTOLOMEO, *Univ. of Rome "Tor Vergata", Italy*
Andrew BELL, *Univ. of Leeds, UK*
Shyamal BHADRA, *Central Glass and Ceramic Research Institute, India*
Brian BIRCH, *Univ. of Bedfordshire, UK*
CHEN Chonglin, *The Univ. of Texas at San Antonia, USA*
Joydeep DUTTA, *Asian Institute of Technology, Thailand*
Jeffrey FERGUS, *Univ. of Auburn, USA*
Perena GOUMA, *State Univ. of New York, USA*
Rolf HEMPELMANN, *Universität des Saarlandes, Germany*
Peter HESKETH, *Georgia Institute of Technology, USA*
Thomas JACOB, *Indian Institute of Science, India*
Animesh JHA, *Univ. of Leeds, UK*
JIA Quanxi, *Los Alamos National Laboratory, USA*
Ishaque KHAN, *Illinois Institute of Technology, USA*
Bo LIEDBERG, *Linkoping Univ., Sweden*
LIU Meilin, *Georgia Institute of Technology, USA*
Cesare MALAGU, *Univ. of Ferrara, Italy*
Yoshihioko SADAOKA, *Ehime Univ., Japan*
Amarnath SEN, *Central Glass and Ceramic Research Institute, India*
Youichi SHIMIZU, *Kyushu Institute of Technology, Japan*
Hariharan SRIKANTH, *Univ. of South Florida, USA*
Srinivas TADIGAPPA, *Pennsylvania State Univ., USA*
Louisa TORSI, *Università degli Studi di Bari, Italy*
TUAN Wei-Hsing, *National Taiwan Univ., Taiwan*
WANG Jiagong, *NUS, Singapore*

SYMPOSIUM K: NANOSTRUCTURED AND BULK MATERIALS FOR ELECTROCHEMICAL POWER SOURCES*

Chair **S.R.S. PRABAHARAN,** *The University of Nottingham, Malaysia*
Faculty of Engineering and Computer Science
The University of Nottingham Malaysia Campus (UNMC),
Jalan Broga, 43500 Semenyih, Selangor, Malaysia
Tel: (603) 8924 8125, Fax: (603) 8924 8017, Email: prabaharan.sahaya@nottingham.edu.my

Co-Chairs **Ralph J. BRODD,** *Valence Technology Inc., USA*
B.V.R. CHOWDARI, *National University of Singapore, Singapore*
LU Li, *National University of Singapore, Singapore*
G. V. SUBBA RAO, *Materials Research Society (Singapore), Singapore*

This symposium is an interdisciplinary forum devoted to all aspects of science and technology of bulk and nanostructured materials as applied to electrochemical power sources. Special attention is also focused on the current state-of-the-art of Phospho-Olivine cathode materials. The main features of the symposium focus on the development challenges and theoretical considerations in the following contexts: (1) Rechargeable batteries – electrodes and electrolytes for lithium-, lithium ion-, lithium microbattery and NiMH; (2) Fuel cells- polymer electrolytes, membrane technology, bipolar plates, fuel cell processing, cell design and engineering, thin film and micro patterning technologies for micro fuel cells; (3) Electrochemical capacitors- carbonaceous materials, mesoporous carbon electrodes, graphitic nanofibers, carbon nanotubes, metal oxides, separator materials, electrolytes, cell design, interfacial kinetics, hybrid capacitors, pseudo capacitors and other related materials.

Invited Speakers ***(Partial/Tentative)***

Khalil AMINE, *Argonne National Lab, USA*
Jerry BARKER, *Valence Technology, Inc., USA*
Philippe BIENSAN, *SAFT, France*
Gerbrand CEDER, *MIT, USA*
Claude DELMAS, *ICMCB-CNRS, France*
Scott W. DONNE, *University of Newcastle, Australia*
Tony HOLLENKAMP, *CSIRO Energy Technology, Australia*
Taniguchi IZUMI, *Tokyo Institute of Technology, Japan*
Allen JAN, US *Army Research Lab, USA*
JOW T., *Army Research Lab, USA*
Kiyoshi KANAMURA, *Tokyo Metropolitan Univ., Japan*
Prashant KUMTA, *Carnegie Mellon Univ., USA*
LIAW Bor Yann, *Univ. of Hawaii, USA*
Doug MACFARLANE, *Monash Univ., Australia*
Arumugam MANTHIRAM, *Univ. of Texas at Austin, USA*
Christian MASQUELIER, *Univ. Picardie Jules Verne, France*
Sanjeev MUKERJEE, *Northeastern Univ., USA*
Katsuhiko NAOI, *Tokyo Univ. of Agriculture & Technology, Japan*
Tsutomu OHZUKU, *Osaka City Univ., Japan*
John OWEN, *Southampton Univ., UK*
Yazid SAIDI, *Valence Technology, Inc., USA*
Nigel SAMMES, *Univ. of Connecticut, USA*
Joop SCHOONMAN, *Delft Univ. of Technology, The Netherlands*
Kamal SINGH, *Amaravathi Univ., India*
Iyota TOMOKAZU, *Tokyo Institute of Technology, Japan*
Enrico TRAVERSA, *Univ. of Rome "Tor Vergata", Italy*
Joachim UFHEIL, *Paul Scherrer Insitut, Switzerland*
Masataka WAKIHARA, *Tokyo Institute of Technology, Japan*
WANG JiQiang, *Tianjin Institute of Power Sources, China*
WEI Bingqing, *Louisiana State Univ., USA*
Anthony WEST, *The Univ. of Sheffield, UK*
M. Stanley WHITTINGHAM, *SUNY at Binghamton, USA*
Margret WOHLFAHRT-MEHRENS, *ZSW, Germany*
WU Yuping, *Fudan Univ., China*
Atsuo YAMADA, *Tokyo Institute of Technology, Japan*
Masahiro YOSHIMURA, *Tokyo Institute of Technology, Japan*
ZHOU Yun Hong, *Wuhan Univ., China*

** This symposium is partially sponsored by Valence Technology Inc., USA*

SYMPOSIUM L: CATALYTIC MATERIALS AND TECHNOLOGIES FOR A SUSTAINABLE ECONOMY

Chair **Stephan JAENICKE,** *National University of Singapore*
3 Science Drive 3, Singapore 117543
Tel: (65) 65162918, Fax: (65) 6779 1691, Email: chmsj@nus.edu.sg

Co-chairs **CHUAH Gaik Khuan,** *National University of Singapore*
WONG Pui Kwan, *Institute of Chemical and Engineering Sciences, Singapore*

The phenomenal economic development of China and India has led to substantial increases in the demand for natural resources, most notably oil and gas. Rising prices for many raw materials and emerging environmental problems led to renewed awareness of the finite resources of the world in which we live, and the environmental impact of the current technologies. The development of a sustainable economy based on resource-efficient catalytic processes emerges therefore as the primary challenge for the 21st century.
The symposium will address the status of catalytic materials for energy efficient processes with good atom efficiency. It will cover the following topics: C1-Chemistry, Catalyst Engineering, Plant-based Renewable Resources, White Bio-technology, Green Chemistry, Micro- and Mesoporous Materials in Catalysis, Direct Synthesis, Photocatalysis, and Electrocatalysis.

Keynote Speakers ***(Partial/Tentative)***
CHEN Soofin, *NTU, Taiwan*
Terunori FUJITA, *Mitsui Chemicals, Inc., Japan*
Pierre GALLEZOT, *IRC-CNRS, France*
Wolfgang HÖELDERICH, *RWTH, Germany*
LIN Jianyi, *ICES, Singapore*
Thomas MÜLLER, *TU Munich, Germany*
Yoel SASSON, *The Hebrew Univ. of Jerusalem, Israel*
Takashi USHIKUBO, *Mitsubishi Chemical Corp., Japan*

SYMPOSIUM M: NEW ROUTES TO INORGANIC MATERIALS, FILMS AND NANOCRYSTALS

Chair **Jagadese J. VITTAL,** *National University of Singapore, Singapore*
Department of Chemistry, 3 Science Drive 3, Singapore 117543
Tel: (65) 6516 2975, Fax: (65) 6779 1691, Email: chmjjv@nus.edu.sg

Co-Chairs **CHIN Wee Shong,** *National University of Singapore, Singapore*
S. S. MANOHARAN, *IIT-Kanpur, India*
E.R.T. TIEKINK, *University of Texas at San Antonio, San Antonio, USA*

New methods of making existing inorganic materials as well as new materials are always interesting and challenging for solid-state materials chemists. The quality of these materials and their properties depend on the methods of synthesis. Hence, this symposium will focus on several synthetic methods including solvothermal, hydrothermal, molten salt method, Sol-gel method, solid-state reactions, single-source approach, ion-exchange, etc. to synthesize bulk inorganic materials and thin films.
The study of nanometer size compounds is an exciting area of research which offers opportunities for innovation and creativity. The shape and size of nanocrystals are mainly controlled by synthetic routes and crystal growth kinetics. Hence in this 'bottom-up' approach of making new nanoparticles, there is plethora of opportunities for synthetic chemists to make a profound contribution. The symposium will also focus on new synthetic methods, characterization and properties of inorganic nanocrystals including metals, alloys, oxides, sulfides, selenides, tellurides, nitrides, phosphides, halides, etc.

Keynote Speakers ***(Partial/Tentative)***
Pingyun FENG, *Univ. of California, Riverside, USA*
Aloysius F. HEPP, *NASA Glenn Research Center, USA*
P. Shiv HALASYAMANI, *Univ. of Houston, USA*
Richard B. KANER, *Univ. of California, Los Angeles, USA*
Kattesh V. KATTI, *Univ. of Missouri-Columbia, USA*
LOH Kian Ping, *NUS, Singapore*
Linda F. NAZAR, *Univ. of Waterloo, Canada*
Paul O'BRIEN, *Univ. of Manchester, UK*
Satish OGALE, *National Chemical Laboratory, Pune, India*
Ivan P. PARKIN, *Univ. College, UK*
K.C. PATIL, *Indian Institute of Science, Bangalore, India*
A. RAMANAN, *Indian Institute of Technology, Delhi, India*
Thirumalai VENKATESAN, *Univ. of Maryland, USA*
YANG Shihe, *HKUST, China*
Jackie YING, *IBN, Singapore*
Jeffrey I. ZINK, *Univ. of California, Los Angeles, USA*

SYMPOSIUM N: SYNCHROTRON RADIATION FOR MAKING AND MEASURING MATERIALS

Chair **Herbert O. MOSER,** *Singapore Synchrotron Light Source, Singapore*

Co-Chairs **Sunggi BAIK,** *POSTECH, Korea*
Helmut DOSCH, *Max Planck Institute, Germany*
Marian CHOLEWA, *Singapore Synchrotron Light Source, Singapore*

Correspondence **Maryate MUHAMAD**
Singapore Synchrotron Light Source
National University of Singapore, Singapore 117603
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Covering a spectral range of more than 7 orders of magnitude from hard X-rays to the far infrared with highly brilliant polarized radiation, synchrotron radiation is a prime tool for the characterization of materials and processes as well as for the structuring of materials by lithography and synchrotron-radiation-assisted etching and deposition. Even new composite materials such as electromagnetic metamaterials have been produced by means of synchrotron radiation more recently.
This symposium solicits presentations dealing with the generation and application of synchrotron radiation for the purpose of characterizing, modifying or creating materials and relevant processes in the whole range of fields extending from archaeology and artworks over bioengineering, chemical and environmental science and engineering, data storage, forensics, life sciences, materials science and engineering, micro/nanomanufacturing, nano science and technology to physics and zoology.

Keynote Speakers ***(Partial/Tentative)***
M. Zahid HASAN, *Princeton Univ., USA*
Keith A. NUGENT, *Univ. of Melbourne, Australia*
Yoshio WATANABE, *JASRI/SPring-8, Japan*

Invited Speakers ***(Partial/Tentative)***
Sunggi BAIK, *POSTECH, Korea*
Helmut DOSCH, *Max Planck Institute, Germany*
Jin Kon KIM, *POSTECH, Korea*
Federico ROSEI, *Univ. du Quebec, Canada*
Andrew WEE Thye Shen, *NUS, Singapore*
YANG Ping, *SSLS, Singapore*

SYMPOSIUM O: FRONTIERS IN COMPUTATIONAL MATERIALS SCIENCE

Chair **FENG Yuan Ping,** *National University of Singapore, Singapore*
2 Science Drive 3, Singapore 117542
Tel: (65) 6516 2960, Fax: (65) 6777 6126, Email: phyfyp@nus.edu.sg

Co-Chairs **WU Ping,** *Institute of High Performance Computing, Singapore*
David J. SROLOVITZ, *Princeton and Yeshiva University, USA*
Duc NGUYEN-MANH, *UKAEA, UK*

Modeling and simulation play a more and more important role in the design and study of new materials. This symposium aims to provide a forum for scientists and engineers who are involved in computational materials science to present and discuss latest development in computational methods related to materials science and their applications. The Symposium will cover the hierarchy of materials simulation, such as density functional theory based methods, Monte Carlo, molecular dynamics simulations, tight-binding and effective medium approaches, coarse graining and mesoscopic modeling, continuum and quasi-continuum approaches, etc. and their applications to different materials.

Keynote Speakers *(Partial/Tentative)*
Gerbrand CEDER, *MIT, USA*
Steven G. LOUIE, *UC Berkeley, USA*

Invited Speakers *(Partial/Tentative)*
Peter BLAHA, *Technische Universitat Wien, Germany*
C. T. CHAN, *HKUST, China*
G. P. DAS, *India Association for the Cultivation of Science, India*
Sergei DUDAREV, *UKAEA Culham Division, UK*
Alphonso FINEL, *CNRS-ONERA, France*
X. G. GONG, *Fudan Univ., China*
Guang Yu GUO, *National Taiwan Univ., Taiwan*
Andrew HORSFIELD, *Univ. College London, UK*
J. IHM, *Seoul National Univ., Korea*
P. JENA, *Virginia Commonwealth Univ., USA*
Yoshiyuki KAWAZOE, *Tohoku Univ., Japan*
Adam KIEJNA, *Univ. of Wroclaw, Poland*
Risto M. NIEMINEN, *Helsinki Univ. of Technology, Finland*
M. ŠOB, *Academy of Sciences, Czech Republic*
K. TERAKURA, *Kokkaido Univ., Japan*
John TSE, *Univ. of Saskatchewan, Canada*
V. VITEK, *Univ. of Pennsylvania, USA*
Enge WANG, *Chinese Academy of Sciences, China*
Su-Huai WEI, *National Renewable Energy Lab, USA*
François WILLAIME, *Service de Recherches de Métallurgie Physique, France*
Christopher WOLVERTON, *Ford Research and Advanced Engineering, USA*
Shengbai ZHANG, *National Renewable Energy Lab, USA*
Zhenyu ZHANG, *Oak Ridge National Lab, USA*

POST CONFERENCE WORKSHOP FOR SYMPOSIUM O - WIEN2K WORKSHOP
6th to 9th July 2007

The **WIEN2K workshop** will be organized at the Institute of High Performance Computing (IHPC), Singapore, from 6 to 9 July 2007, as a post conference workshop to ICMAT 2007.

The **WIEN2K program package** is one of the most popular DFT codes in Computational Materials Science (refer to http://www.wien2k.at)and enables calculation of electronic structure of solids with high precision. The **WIEN2K Workshop** includes elementary and advanced tutorials on DFT, electronic structure calculations, magnetic, optical and transport properties as well as detailed introduction and hands-on exercises with the WIEN2K program.

The four-day workshop will focus on WIEN2K tutorials and exercises. In addition, there will be oral and poster presentations by the participants. The intended tutors for the workshop are: Prof. K. Schwarz, Prof. P. Blaha, Dr. R. Laskowski, Prof. P. Novak, Dr. G. Madsen, Prof. C. Ambrosch-Draxl.

Further details on the workshop and registration fees are posted on the website, under Symposium O's webpage. Participants of ICMAT 2007 will enjoy discounted registration rate for the workshop.

SYMPOSIUM P: ELECTROMAGNETIC MATERIALS

Chair **LIM Hock,** *National University of Singapore, Singapore*

Co-Chairs **GAN Yeow Beng,** *National University of Singapore, Singapore*
Temasek Laboratories, 5 Sports Drive 2, Singapore 117508
Tel: (65) 6516 1675, Fax: (65) 6872 6840, Email: tslganyb@nus.edu.sg

LEE Kim Seng, *DSO National Laboratories, Singapore*
Konstantin N. ROZANOV, *Institute of Theoretical and Applied Electromagnetics, Russia*

The Symposium will deliberate on the electrical and magnetic properties of materials relevant to the design of unconventional antennas, microwave circuits/components, anti-reflection media and coatings, EMI shielding structures, radomes, etc. Though a classical research topic, some recent advancement in technologies has led to new capabilities to create and control fine-scale structures. This has inspired scientists to develop new materials with exceptionally high permittivity or permeability, as well as metamaterials (or negative index materials) with unusual electromagnetic properties. Novel materials based on the use of active devices to control their electromagnetic performances have also been proposed. The multi-disciplinary nature of these new materials has brought together researchers from materials science, physics and electrical engineering to explore and deepen our current understanding of electromagnetic wave propagation. A wide range of new commercial/defence applications of these materials is expected to emerge in the near future.

Invited Speakers ***(Partial/Tentative)***

Masanori ABE, *Tokyo Institute of Technology, Japan*
Olivier ACHER, *CEA Le Ripault, France*
Luk ARNAUT, *National Physical Laboratory, UK*
Longjiang DENG, *Univ. of Electronic Science and Technology of China, China*
Jin Au KONG, *MIT, USA*
Andrei N. LAGARKOV, *Institute for Theoretical and Applied Electromagnetics, Russia*
Akhlesh LAKHTAKIA, *Pennsylvania State Univ., USA*
Benedikt A. MUNK, *Ohio State Univ., USA*
Sergey A. NIKITOV, *Institute of Radioengineering and Electronics, Russia*
Konstantin N. ROZANOV, *Institute for Theoretical and Applied Electromagnetics, Russia*
YAO Xi, *Tongji Univ., China*

SYMPOSIUM Q: ADVANCED STRUCTURAL AND FUNCTIONAL MATERIALS FOR PROTECTION

Chairs

SHANG Huai Min, *Nanyang Technological University, Singapore*
William LAU, *Defence Science & Technology Agency, Singapore*

Co-Chairs

MA Jan, *Nanyang Technological University, Singapore*
LEE Nam Sua, *Defence Science & Technology Agency, Singapore*
Alfred TOK, *Nanyang Technological University, Singapore*
School of Materials Science & Engineering, Nanyang Avenue, Singapore 639798
Tel: (65) 6790 4935, Fax: (65) 6790 9081, Email: miytok@ntu.edu.sg

Protection materials represent one of the most challenging materials to synthesize and process due to the extreme application requirements. The understanding of the various mechanisms & sciences behind materials' behavior will contribute invaluably to the development of materials for protection applications. This symposium provides a platform for academics, scientists, technologists and industrial players to present innovations, exchange views, share results and discuss opinions and thoughts in the field of advanced structural and functional materials for protection. Specifically, the symposium shall focus on materials for protection of civilians and soldiers against blast, fragmentation, unconventional attack, and also multi-functional materials for enhancement of soldier performance.

Keynote Speakers ***(Partial/Tentative)***
Dennis FICHOU, *CEA CNRS, France*
Paula HAMMOND, *ISN MIT, USA*
Richard KWOK, *ST Kinetics, Singapore*
QUEK Gim Phew, *DSO, Singapore*
ZHAO Xinbing, *Zhejiang University, China*

SYMPOSIUM R: POLYMER AND MOLECULAR ELECTRONICS: CHEMISTRY, PHYSICS & MATERIALS SCIENCE

Chairs

Hardy CHAN, *National University of Singapore, Singapore*
Department of Chemistry, 3 Science Drive 3, Singapore 117543
Tel: (65) 6516 2673, Fax: (65) 6777 1691, Email: chmcsoh@nus.edu.sg

Freddy BOEY, *Nanyang Technological University, Singapore*

Co-Chairs

Peter HO, *National University of Singapore, Singapore*
Suresh VALIYAVEETTIL, *National University of Singapore, Singapore*
Alan SELLINGER, *Institute of Materials Research and Engineering, Singapore*

Semiconductors based on inorganic silicon and gallium arsenide have been the backbone of the electronic and optoelectronic industries for the last five decades. For future applications, however, competitive electronic manufacturing which depends on the development as well as integration of novel and cost effective materials technology and devices is needed. This symposium provides a forum for discussion of the physics, chemistry, materials science, fabrication and applications of future generations of organic materials and their devices.

Invited Speakers ***(Partial/Tentative)***
Rigoberto ADVINCULA, *Univ. of Houston, USA*
Thomas BJORNHOLM, *Univ. of Copenhagen, Denmark*
Paul BLOM, *Univ. of Groningen, Netherlands*
Paul BURN, *Univ. of Oxford, UK*
Jeremy BURROUGHES, *Cambridge Display Technology, UK*
Franco CACIALLI, *Univ. College London, UK*
CHEN Show-An, *National Tsing Hua Univ., Taiwan*
Ananth DODABALAPUR, *Univ. of Texas, USA*
Denis FICHOU, *CEA-Saclay, France*
Ghassan JABBOUR, *Arizona State Univ., USA*
Alex JEN, *Univ. of Washington, USA*
Antoine KAHN, *Princeton Univ., USA*
Karl LEO, *Technical Univ. of Dresden, Germany*
Mark REED, *Yale Univ., USA*
John ROGERS, *Univ. of Illinois at Urbana-Champaign, USA*
Henning SIRRINGHAUS, *Plastic Logic, UK*

SYMPOSIUM S: EDUCATION IN NANOSCIENCE AND NANOENGINEERING

Chair **Vincent TAN,** *National University of Singapore, Singapore*

Co-Chairs **Andrew WEE,** *National University of Singapore, Singapore*
Mark BLAMIRE, *Cambridge University, UK*
Paul PIGRAM, *La Trobe University, Australia*
Grant NORTON, *Washington State University, USA*

Correspondence **Kelly LOW**
NUS Nanoscience & Nanotechnology Initiative
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Tel: (65) 6516 4265, Fax: (65) 6872 5563, Email: kellylow@nus.edu.sg

The essence of nanoscience and nanoengineering is the ability to understand and manipulate matter at the molecular level, to create artificial structures at the nanoscale with potentially novel functions. Nanoscience is therefore an exciting new multidisciplinary realm that brings together the traditional disciplines of physics, chemistry, biology and engineering.
New educational methods and techniques are being explored at all levels of the university system in the U.S., Europe and Australiasia, to teach the multidisciplinary topics that comprise the field. Societal effects accompanying the widespread deployment of nanotechnology are an important educational concern. There are some stand-alone nano degree programs in some universities, but in others there are modules within traditional physics, chemistry or engineering degree courses. In this forum, we intend to explore, through invited and contributed papers and posters, all aspects of the current state of nanoscience /engineering/technology education at the university undergraduate and graduate levels.

Keynote Speakers ***(Partial/Tentative)***
Flemming BESENBACHER, *Univ. of Aarhus, Denmark*

Invited Speakers ***(Partial/Tentative)***
John E E BAGLIN, *IBM Almaden Research Center, USA*
Mark BLAMIRE, *Univ. of Cambridge, UK*
Peter A.GLASOW, *IUMRS, Germany*
Jan-Olle MALM, *Lund Univ., Sweden*
David MCPHAIL, *Imperial College London, UK*
Grant NORTON, *Washington State Univ., USA*
Paul PIGRAM, *La Trobe Univ., Australia*

GEM⁴ CONFERENCE ON CANCER & SUMMER SCHOOL

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The Global Enterprise for Micro-Mechanics and Molecular Medicine (GEM⁴) and Materials Research Society of Singapore jointly organize the "GEM⁴ Conference on Cancer" in conjunction with International Conference on Materials for Advanced Technologies (ICMAT 2007).

Nine thematic symposia, bringing together state-of-the-art topics and issues at the intersection of engineering, technology, life sciences, medicine and public health in the context of cancer and human health will be organized as part of the conference.

In addition, a two-week long summer school staring from 25 June 2007, will be held in conjunction with the cancer conference on the topic of "Cell and Molecular Mechanics in Biomedicine". This summer school will be the second in the series, following the inaugural summer school held at MIT, USA, in August 2006 (with a focus on infectious diseases). Strong laboratory experience and exposure to local medical research facilities will be provided in addition to introductory and advanced tutorials.

A number of world leaders in the field, several of whom are co-PI's in some of the newly established NIH (USA) centers of Excellence in Nanotechnology in Cancer Research, who are also researchers from GEM⁴ participating institutions will participate at this conference.

GEM⁴ CONFERENCE ON CANCER – THEMATIC SYMPOSIA

(1) NOVEL BIOMATERIALS FOR DRUG DELIVERY

Corresponding Chair: **YONG Zhang,** *National University of Singapore, Singapore*
Division of Bioengineering, 9 Engineering Drive 1, Blk EA-03-12, Singapore 117576
Tel: (65) 6516 4871, Fax: (65) 6872 3069, Email: biezy@nus.edu.sg

This symposium deals with the state-of-the-art design and application of biomaterials in the delivery of drugs and bio-therapeutics. Original research on a wide range of novel biomaterials, including but not limiting to, natural and synthetic polymers, ceramics and composites, are welcomed. In addition, special interest is also paid to novel methods of synthesizing these materials and new ways of delivering drugs.

(2) TUMOUR IMMUNOLOGY

Corresponding Chair: **J.-P. ABASTADO,** *Singapore Immunology Network, Singapore*
Laboratory for Tumour Immunology, Centre for Molecular Medicine
61 Biopolis Drive, Proteos #06-07B, Singapore 138673
Tel: (65) 6586 9635, Email: abastado@immunol.a-star.edu.sg

Chair: **Pierre van der BRUGGEN,** *Ludwig Institute for Cancer Research, Brussels*
Avenue Hippocrate 74, UCL 7459, second floor, B- 1200 Brussels Belgium
Tel: 32 2 764 7431, Fax: 32 2 762 9405, Email: pierre.vanderbruggen@bru.licr.org

Immunotherapies aimed at harnessing the immune system against cancers represent novel and attractive approaches to complement standard treatments of cancers, especially to provide long term protection.
Therapeutic antibodies (such as Herceptin, Rituximab), DLI (Donor Lymphocyte Infusion) following bone marrow transplant are typical examples of proven and widely accepted immunotherapies. In contrast, the clinical efficacy of active immunizations (using peptides or proteins, dendritic cells vaccines or viral vectors) has been rather limited so far. Even though such approaches allow inducing potent anti-tumour immune responses directed against antigens expressed by tumour cells, tumours manage to escape immune recognition.
This symposium will focus on basic and clinical studies aimed at understanding tumour escape from the immune system. Specifically the role of the immune system to favour or combat tumours will be analysed. Special emphasis will be put on local delivery of drugs and vaccines targeting the tumour or its microenvironment.

(3) BIOIMAGING OF CANCER

Corresponding Chair: **WANG Shih-Chang, FRANZCR,** *National University of Singapore, Singapore*
Department of Diagnostic Radiology
5 Lower Kent Ridge Road, National University Hospital, Singapore 119074
Tel: (65) 6772 4211, Fax: (65) 6773 0190, Email: dnrwsc@nus.edu.sg

Chair: **NIE Shuming,** *Emory University and Georgia Institute of Technology, USA*
101 Woodruff Circle, Suite 2001, Atlanta, GA 30322, USA
Tel: 404 712 8595 / 404 727 0391, Fax: 404 727 3567, Email: snie@emory.edu

"Bioimaging" generally refers to the imaging of living tissues, organs, animals and humans, has expanded in scope enormously in the last 20 years, and now encompasses a huge range of technologies.
Nowhere has this area of research interest in imaging been as intense as in the field of cancer, where imaging is integral to every stage of modern clinical cancer practice, from the initial detection and diagnosis of disease to its staging, its locoregional treatment and ultimately, its progression and recurrence. X-ray, CT, MRI and now PET have

been used extensively in the diagnostic armamentarium of the clinical oncologist.
However, there is a much broader role for imaging to play beyond its traditional strength of medical imaging in hospitals, and that is in the field of bioimaging of cancer function, metabolism and genetic expression in vivo in tissue and animal models of disease, as well as the proof of concept development of novel therapies where early physiological response by cancers will facilitate drug and other therapy development. In this way, bioimaging is proving critical for evaluation of new diagnostic approaches and therapies for cancer, from nanotechnology to biomedical devices to new pharmaceuticals across the entire spectrum of human disease.
This symposium will provide an update across a broad range of bioimaging methods and their applications to cancer research, diagnosis and treatment.

(4) BIOPHYSICAL ASSAYS AND CANCER DIAGNOSTICS

Corresponding Chairs:

Lance MILLER, *Genome Institute of Singapore, Singapore*
Cancer Biology and Pharmacology
60, Biopolis Street, #02-01, Genome Building, Singapore 138672
Tel: (65) 6478 8100 / 8000, Email: millerL@gis.a-star.edu.sg

MANUEL Salto-Tellez, *National University of Singapore, Singapore*
Yong Loo Lin School of Medicine, Department of Pathology
5 Lower Kent Ridge Road, National University Hospital, Singapore 119074
Tel: (65) 6772 4704 / 4300, Fax: (65) 6778 0671, Email: patmst@nus.edu.sg

Molecular diagnostics is the fastest growing area of modern medicine. Its rapid growth is due to several factors, including: a) the discovery of single-biomarker tests that facilitate diagnosis, prognosis and/or therapeutic decision making in cancer; b) the application of new technologies to the detection of disease biomarkers, such as microarray and nanotechnology; and c) the clinical validation of high-throughput and high-content analysis platforms. The goal of this symposium is to provide an interdisciplinary forum for the discussion of state-of-the-art cancer diagnostics, the potential of new and novel physical and/or molecular strategies, and the interconnects between biotechnology, biomedicine and bioindustry that are advancing the field of personalized medicine.

(5) GENETIC AND MOLECULAR EPIDEMIOLOGY OF CANCER

Corresponding Chair:

CHIA Kee Seng, *National University of Singapore, Singapore*
Centre for Molecular Epidemiology, Yong Loo Lin School of Medicine,
c/o Department of Community, Occupational and Family Medicine
16 Medical Drive, MD3, Singapore 117597
Tel: (65) 6478 9547, Fax: (65) 6779 1489, Email: cmewees@nus.edu.sg

Genetic variation alone is unlikely to account for the worldwide increase in cancer incidence. The importance of interaction between environmental and genetic factors is increasingly recognised. Integrating recent 'omics' tools in population-based studies is becoming increasingly popular in the study between genetic predisposition and environmental exposures in cancer incidence and survival.
This symposium will showcase gene-environment interactions through epidemiological studies. In particular, it will highlight findings from breast, prostate and colorectal cancers. It will also address the statistical challenges that researchers face in addressing these gene-environment interactions. Recent developments in high-throughput technologies together with repeated measures of environmental exposures add to the complexities of the field, and will be discussed in this symposium.

(6) CANCER CELL INTERACTION, MOTILITY AND METASTASIS

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Cancer can be characterized by the uncontrolled proliferation of abnormal cells which spread to various parts of the body. Malignant cells in the primary tumor invade healthy tissues locally and often metastasize to distant sites. At the present time, metastastic disease for most cancer types cannot be cured. There is an urgent need to unravel the biomechanics of tumor cell migration and how this process can contribute to cancer metastasis. This symposium will focus on areas related to the detailed mechanisms involved in invasion and metastasis of cancer cells. These include the reprogramming of adhesion processes in cancer cells during intravasation and extravasation at distant sites. The rheology of tumor cells possibly interacting with blood cells in the circulation will also be addressed. A better understanding of these mechanisms will undoubtedly contribute to develop specific and effective therapies to target these migratory cancer cells or disrupt the metastatic process.

(7) COMPUTATIONAL SYSTEMS BIOLOGY OF CANCER

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(8) SURGICAL INTERVENTION & ROBOTICS

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(9) CANCER NANOTECHNOLOGY

Corresponding Chair: **FENG Si-Shen,** *National University of Singapore, Singapore*
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Cancer is a leading cause of deaths and has become the #1 killer in many countries including Singapore. Nevertheless, no substantial progress can be observed in the past 50 years in fighting against cancer. The cancer death rate in US was 1.939‰ of the total population in 1950 and still 1.940‰ in 2001, 1.934‰ in 2002 and 1.901‰ in 2003. Cancer nanotechnology will radically change the very foundations of diagnosis, treatment and prevention of cancer. This symposium is a multidisciplinary forum involving to all aspects of nanoscience, nanoengineering and nanomedicine as applied to cancer diagnosis, treatment and prevention. However it will be focused on the development challenges of nanotechnologies, nanostructured biomaterials and medical devices designed in nanoscale.

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The sponsorship & exhibition prospectus is available for download from the conference website: **www.mrs.org.sg**

CONFERENCE PUBLICATION

All registered participants for the conference will receive a copy of the conference program book, a copy of the abstracts book of the symposium they have selected during registration, and a CD ROM of all abstracts accepted for the conference.

Each symposium is likely to publish its own proceedings volume as full-length manuscripts, either as special journal issues or standalone proceedings. Whichever format is used, all papers will be peer-reviewed. Details will be available on the conference website from September 2006.

GEM^4 Conference on Cancer may provide extended abstracts instead of regular proceedings.

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Whilst every attempt will be made to ensure that all aspects of the conference mentioned in this announcement will take place as scheduled, should the need arise, the Organising Committee reserves the right to make last minute changes without prior notice.