For Immediate Release
August 3, 2009

MEDIA RELEASE

Nanotechnology Experts Converge in Singapore for the 1st Nano Today Conference
Over 450 nanoscience researchers expected at event organized by Nano Today and IBN

Singapore, August 3, 2009 – Current developments in nanoscience and nanotechnology and their extensive impact on our lives will take center stage at the 1st Nano Today Conference that will be held at the Biopolis in Singapore from August 3 to 5. 33 of the world’s leading nanotechnology experts will address over 450 international delegates at the three-day conference organized by the Institute of Bioengineering and Nanotechnology (IBN), the world’s first bioengineering and nanotechnology research institute, and Nano Today, a leading nanoscience and nanotechnology journal, published by Elsevier, with an impact factor of 8.795.

This inaugural conference features plenary lectures by 3 eminent pioneers of the field, 30 invited talks by leading scientists from 26 internationally renowned institutions, 75 contributed oral and 205 poster presentations by researchers from 33 countries. The contributed presentations were selected from over 600 abstract submissions from countries including Australia, Austria, Bangladesh, Belarus, Canada, China, Czech Republic, Denmark, France, Georgia, Germany, Greece, Hong Kong, India, Indonesia, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Malaysia, The Netherlands, Poland, Portugal, Russia, Singapore, Spain, Taiwan, Thailand, United Kingdom and the United States.

Chaired by Nano Today Editor-in-Chief and IBN Executive Director, Professor Jackie Y. Ying, the 1st Nano Today conference will focus on the latest advances in nanostructured materials and systems for wide-ranging applications in fields such as electric, optical, magnetic and biomedical devices, chemical and biologics synthesis, energy generation and storage, as well as biomaterials and biomimetic systems.

“Nanotechnology is making a big impact in the scientific world today because of its multidisciplinary nature, and its tremendous potential in areas such as biomedicine, chemical synthesis, energy generation and photonics. The Nano Today journal and IBN are delighted to organize the first Nano Today Conference to provide a platform for researchers from all over the world to share the latest developments in this exciting field. It is also our privilege to have many distinguished scientists, who have made invaluable contributions to nanotechnology, as our speakers at this conference. Moving forward, this conference will be held on a bi-annual basis, and we look forward to a successful conference this year,” said Professor Jackie Y. Ying.

“At a time when this field is continuing to provoke huge interest, discussion, and serious research output, the opportunities for publishers have never been more exciting. Nano Today is a serious reviews and opinions publication, publishing world class content as

Co-Organizers

Nano Today
Impact Factor 8.795

www.nanotoday2009.com
rapidly as possible. Elsevier is delighted that Professor Jackie Y. Ying brought the first *Nano Today* conference here to Singapore, at the world's first bioengineering and nanotechnology research institute,” said Deborah Logan, Executive Publisher, *Nano Today*.

The first Plenary Lecture *(August 3, 9:45am to 10:30am)* titled “Nanoscience and Nanotechnology: The Key to New Studies in Other Areas of Science and Technology” will be delivered by Professor Herbert Gleiter from the Institute of Nanotechnology Research Center Karlsruhe, Germany. Professor Gleiter pioneered a new field of materials science research by generating well-defined, uniform nanocrystals using a novel vapor phase synthesis approach. This has made possible major advances in nanostructured materials. His talk will focus on the emergence and diversity of nanoscience and nanotechnology that enables new scientific discoveries, and opens the way to novel applications in scientific areas such as cancer research, molecular biology, astronomy and new materials. In honour of his achievements and leadership, the first *Nano Today* Award, which recognizes outstanding contributions in the field, will also be awarded to Professor Gleiter at the Conference Dinner on August 4.

The second Plenary Lecture *(August 4, 9:30am to 10:15am)* on “Graphene, The New Nanocarbon” will be presented by Professor C. N. R. Rao from the Jawaharlal Nehru Center for Advanced Scientific Research, India. Professor Rao is one of the world's foremost solid state and materials chemists. He was one of the earliest to synthesize two-dimensional oxide materials such as La$_2$CuO$_4$. He is the author of over 1,400 research papers and 41 books. His talk will focus on the unique and noteworthy properties of graphene, a fascinating new nanocarbon possessing single or multiple layers of carbon atoms forming six-membered rings.

The third Plenary Lecture *(August 5, 9:30am to 10:15am)* on “Proteins That Nature Never Made” will be presented by Professor David A. Tirrell from California Institute of Technology (Caltech), USA. Professor Tirrell is a pioneer in genetically engineered polymers. He is the Ross McCollum-William H. Corcoran Professor and Chair of the Division of Chemistry and Chemical Engineering at Caltech. His talk will focus on bridging the gap between polymers and proteins by using artificial genes to direct the synthesis of artificial proteins in bacterial cells, and to combine the physical and informational properties of macromolecules.

The conference also features an impressive line-up of 30 invited speakers from leading institutions around the world, including Brandeis University, Brown University, Cornell University, Duke University, Ecole Polytechnique Federale de Lausanne, IBM, Institute of Bioengineering and Nanotechnology, Jilin University, Korea Advanced Institute of Science and Technology, KTH - Royal Institute of Technology, Massachusetts Institute of Technology, National Cancer Institute Alliance for Nanotechnology in Cancer, National Taiwan University, Rutgers University, Sandia National Laboratories, Seoul National University, University of Aarhus, University of California, Berkeley, University of California, Santa Barbara, University of Illinois at Chicago, University of Melbourne, University of Pennsylvania, University of Queensland, University of Rochester, University of Washington, and US Naval Research Laboratory.
To inspire and engage young researchers, 28 students from 18 countries have been granted the Nano Today 2009 Student Travel Awards to present their research results at the conference. The award recipients were selected from over 170 applications, and they received travel funding along with a waiver of the conference registration fee. The international exposure and opportunity to confer with leading nanoscience researchers will be an invaluable experience for these budding scientists.


For media queries and interview requests, please contact:

Elena Tan
Phone: 65 824 7042
Email: elenatan@ibn.a-star.edu.sg

Laura Lau
Phone: 65 6824 7040
Email: sslau@ibn.a-star.edu.sg

Nidyah Sani
Phone: 65 6824 7005
Email: nidyah@ibn.a-star.edu.sg

About Nano Today

Nano Today: An International Rapid Reviews Journal provides a peer-reviewed forum for the publication of authoritative review articles, rapid communications, news and opinions to shape and define the frontiers of nanoscience and nanotechnology through their multidisciplinary applications. Nano Today publishes six print issues per year covering all aspects of nanoscience and nanotechnology. Nano Today is covered by Thompson Reuters Journal Citation Reports for 2007 with an impact factor of 8.795. For more information, please log on to www.nanotoday.com.

About Elsevier

Elsevier is the world’s leading publisher of science and health information, serving more than 30 million scientists, students, and health and information professionals worldwide. Elsevier publishes trusted, leading-edge Scientific, Technical and Medical (STM) information - comprising 2,000 journals and 19,000 books, as well as other products - pushing the frontiers and fueling a continuous cycle of exploration, discovery and application. Find out more from www.elsevier.com.

About the Institute of Bioengineering and Nanotechnology

Co-Organizers

Nano Today
Impact Factor 8.795

www.nanotoday2009.com
The Institute of Bioengineering and Nanotechnology (IBN) was established in 2003 as a national research institute under the Agency for Science, Technology and Research, Singapore, by Executive Director, Professor Jackie Yi-Ru Ying. Prof. Ying was a Professor of Chemical Engineering at the Massachusetts Institute of Technology (1992–2005). In 2008, Professor Ying was recognized as one of "One Hundred Engineers of the Modern Era" by the American Institute of Chemical Engineers for her groundbreaking work on nanostructured systems, nanoporous materials and host matrices for quantum dots and wires. Under her direction, IBN conducts research at the cutting-edge of bioengineering and nanotechnology. IBN's research programs are geared towards linking multiple disciplines across engineering, science and medicine to produce research breakthroughs that will improve healthcare and our quality of life.

IBN's research activities are focused in the following areas:

- **Drug and Gene Delivery**, where the controlled release of therapeutics involve the use of functionalized polymers, hydrogels and biologics for targeting diseased cells and organs, and for responding to specific biological stimuli.

- **Cell and Tissue Engineering**, where biomimicking materials, stem cell technology, microfluidic systems and bioimaging tools are combined to develop novel approaches to regenerative medicine and artificial organs.

- **Biosensors and Biodevices**, which involve nanotechnology and microfabricated platforms for high-throughput biomarkers screening, automated biologics synthesis, and rapid disease diagnosis.

- **Pharmaceuticals Synthesis and Nanobiotechnology**, which encompasses the efficient catalytic synthesis of chiral pharmaceuticals, and new nanocomposite materials for sustainable technology and alternative energy generation.

IBN's innovative research is aimed at creating new knowledge and intellectual properties in the emerging fields of bioengineering and nanotechnology to attract top-notch researchers and business partners to Singapore. Since 2003, IBN researchers have published a total of 502 papers. IBN also plays an active role in technology transfer and spinning off companies, linking the research institute and industrial partners to other global institutions. As of June 2009, IBN has filed 714 patent applications on its inventions and the Institute is currently looking for partners for collaboration and commercialization of its portfolio of technologies. IBN's current staff strength stands at ~ 180 scientists, engineers and medical doctors. With its multinational and multidisciplinary research staff, the institute is geared towards generating new biomaterials, devices, systems, equipment and processes to boost Singapore’s economy in the fast-growing biomedical sector.

IBN is also committed to nurturing young minds, and the institute acts as a training ground for PhD students and undergraduates. In October 2003, IBN initiated a Youth Research Program to open its doors to university students, as well as students and teachers from various secondary schools and junior colleges. It has since reached out to more than 31,075 students and teachers from 205 local and overseas schools and institutions.

For more information, please log on to [www.ibn.a-star.edu.sg](http://www.ibn.a-star.edu.sg)

**APPENDIX**
Conference Topics

- Synthesis and Self-Assembly of Thin Films and Nanocrystals/Nanoparticles
- Functionalization and Size-Dependent Properties of Nanocrystals, Quantum Dots and Nanowires
- Processing and Templating of Nanotubes and Nanoporous Materials
- Tailoring of Polymeric Nanoparticles, Organic-Inorganic Nanocomposites and Biohybrids
- Design and Engineering of Structural and Functional Nanomaterials
- Nanosystems for Biological, Medical, Chemical, Catalytic, Energy, Environmental, Sensing, Diagnostic, Imaging and Magnetic Applications

Abstracts of Plenary Lectures

Plenary Lecture 1:

Herbert Gleiter
Senior Scientist and Institute Professor
Institute of Nanotechnology, Research Center Karlsruhe, Germany

Nanoscience and Nanotechnology: The Key to New Studies in Other Areas of Science and Technology

In recent years a new branch of nanoscience/nanotechnology (NS/NT) seems to emerge. This branch is characterized by the application of preparation methods and/or the diagnostic tools developed in nanoscience/nanotechnology in order to perform either new, decisive experiments or to open the way to novel applications in areas of science that were originally not related to nanoscience/nanotechnology, such as cancer research, molecular biology, astronomy or the synthesis of new types of materials.

In order to highlight the diversity of this new branch, the following two areas in which methods of nanoscience/nanotechnology are applied to other areas of science will be discussed.

(i) Self-assembled nanometer-sized materials the atomic structure of which may be modified so that switches of atomic size are formed. The conductance of these switches is entirely controlled by an externally applied voltage without any mechanical movement of electrodes etc. Reproducible switching was performed between an electrically insulating ("off") state and many "on" states each of which is characterized by a pre-selectable conductance. Materials of this kind may open new perspectives for quantum electronics and the development of logics on an atomic scale.

(ii) Probing the limits of quantum physics addresses one of the basic and still open questions of physics: The applicability of quantum physics to systems of macroscopic size (e.g. a size
of 50 nm or more). NS/NT may contribute to the solution of this question. In fact, NS/NT seems to enable us to perform interference experiments by using beams consisting of clusters with identical mass and moving in parallel with the same velocity in UHV. By utilizing methods of NS/NT, the mass of these clusters may be varied in a controlled manner from about 103 amu up to about 109 amu. If a cluster beam of this kind is transmitted though a suitable diffraction grid, the intensity pattern produced on a screen behind the grid indicates if the movement of the clusters through the grid can be predicted by the laws of quantum physics even if the clusters have macroscopic sizes. (A spherical cluster with a mass of 109 amu has a diameter of about 50 nm). If this would be so, it would have basic consequences for the conceptual understanding of what we call reality. Alternatively, if quantum physics would apply only to objects up to a certain size, this size would be indicted by a change of the intensity pattern on the screen behind the diffraction grid. This change may not only probe the limits of quantum physics but it may also tell us if a transition to classical physics occurs beyond a certain cluster size and which parameters control this size.

This plenary lecture will be held on Monday, August 3, 2009 from 9.30am to 10.15am.

Plenary Lecture 2:

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

Graphene, The New Nanocarbon

Graphene is a fascinating new nanocarbon possessing, single-, bi- or few- (≤ ten) layers of carbon atoms forming six-membered rings. Different types of graphene have been investigated by X-ray diffraction, atomic force microscopy, transmission electron microscopy, scanning tunneling microscopy and Raman spectroscopy. The extraordinary electronic properties of single-and bi-layer graphenes are indeed most unique and unexpected. Other properties of graphene such as gas adsorption characteristics, magnetic and electrochemical properties and the effects of doping by electrons and holes are equally noteworthy. Interestingly, molecular charge-transfer also markedly affects the electronic structure and properties of graphene. Many aspects of graphene are yet to be explored including synthetic strategies which can yield sufficient quantities of graphene with the desired number of layers.

This plenary lecture will be held on Tuesday, August 4, 2009 from 9.30am to 10.15am.
Proteins that Nature Never Made

Macromolecular chemistry has traditionally been divided into two fields, with biochemists and biochemical engineers working on proteins and nucleic acids while polymer chemists and materials scientists have concerned themselves with synthetic polymers. These two classes of macromolecules are profoundly different from one another; proteins and nucleic acids are uniform, well folded, and evolvable, whereas polymers are heterogeneous and for the most part adopt random-coil conformations. These differences in molecular structure and behavior have led to striking differences in the ways in which natural and synthetic polymers are used – largely for information storage and transfer in biology, and largely as materials in the technological world. This lecture will describe an ongoing attempt to bridge the gap between polymers and proteins by using artificial genes to direct the synthesis of artificial proteins in bacterial cells, and to combine the physical and informational properties of macromolecules.

This plenary lecture will be held on Wednesday, August 5, 2009 from 9.30am to 10.15am.