

*Program*

**Nanoscience and Nanotechnology  
for  
Biological/Biomedical/Chemical Sensing**

**June 3-8, 2007  
City University of Hong Kong, Hong Kong**

*Conference Chair*

**Professor S. Tong Lee**

*Conference Co-Chairs*

**Dr. Orlando Auciello  
Dr. Masataka Hasegawa  
Professor Kian Ping Loh  
Professor Robert J. Nemanich  
Professor Dr. Martin Stutzmann  
Professor Paul S. Weiss**

**ECI**

Engineering Conferences International  
6 MetroTech Center  
Brooklyn, NY 11201

T: 1-718-260-3743; F: 1-718-260-3754; [info@eci.poly.edu](mailto:info@eci.poly.edu); [www.engconfintl.org](http://www.engconfintl.org)

Engineering Conferences International (ECI) is a global engineering conferences program, originally established in 1962, that provides opportunities for the exploration of problems and issues of concern to engineers and scientists from many disciplines. ECI is a not-for-profit partnership between the Engineering Conferences Foundation (ECF) and Polytechnic University.

#### ECF BOARD MEMBERS

Barry C. Buckland

Mark Green

Allen I. Laskin

Raymond McCabe

Eli Pearce

David K. Robinson

P. Somasundaran

Chair of ECI Conferences Committee: Jules Routbort

ECI Technical Liaison for this conference: Nghi Lam

Polytechnic University President: Jerry Hultin

Polytechnic Liaison to ECF: T.C. Westcott

ECI Director: Barbara K. Hickernell

ECI Associate Director: Kevin Korpics

## **Conference Sponsors:**

*K. C. Wong Education Foundation, Hong Kong SAR*

*US Army International Technology Center – Pacific*

*City University of Hong Kong, Hong Kong*

## **Invited Speakers:**

USA & Canada:

- R. J. Hamers (University of Wisconsin, USA)
- A. Andrews (Pennsylvania State University, USA)
- N. Kotov (University of Michigan, Ann Arbor, USA)
- N. Petersen (NRC National Institute for Nanotechnology, Canada)
- Y. Qiang (University of Idaho, USA)
- H. R. Tseng (University of California, Los Angeles (UCLA), USA)
- J. Xu (Brown University, USA)

Europe:

- M. Eickhoff (WSI, Technical University of Munich, Germany)
- M. Foss (University of Aarhus, Denmark)
- Th. Frauenheim (Universität Bremen, Germany)
- J. A. Garrido (WSI, Technical University of Munich, Germany)
- A. L. Spetz (Linköping University, Sweden)
- M. Tornow (University of Braunschweig, Germany)

Asia:

- C. H. Fan (Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai)
- M. Y. Gao (Institute of Chemistry, Chinese Academy of Sciences, Beijing)
- H. E. Horng (National Taiwan Normal University, Taipei)
- L. Hsu (National Chiao Tung University, Hsinchu)
- J. R. Hwu (National Tsing Hua University, Hsinchu)
- Y. R. Jeng (National Chung Cheng University, Chia-Yi)
- L. Jiang (Institute of Chemistry, Chinese Academy of Sciences, Beijing)
- H. Kawarada (Waseda University, Japan)
- F. Y. Li (National University of Singapore, Singapore)
- C. T. Lim (National University of Singapore, Singapore)
- C. E. Nebel (AIST, Japan)
- D. B. Shieh (National Cheng-Kung University, Tainan)
- M.S. Yang (City University of Hong Kong, Hong Kong)

## **International Advisory Committee:**

- C. L. Bai (VP, Chinese Academy of Sciences, Beijing)  
Sunney I. Chan (Institute of Chemistry, Academia Sinica, Taipei)  
K. Chong (National Science Foundation, Washington D.C, USA)  
R. Hamers (University of Wisconsin, Madison, Wisconsin, USA)  
U. Goesele (Max Planck Inst. of Micro. Phys., Germany)  
R. Jackman (Univ. College, London, UK)  
N. Kotov (University of Michigan, Ann Arbor, Michigan, USA)  
N. Q. Lam (Applied Physics Letters, ANL, Argonne, Illinois, USA)  
W. K. Liu (Northwestern University, Evanston, Illinois, USA)  
W. Milne (Univ. of Cambridge, Cambridge, UK)  
C. Mirkin (Northwestern University, Evanston, Illinois, USA)  
S. M. Peng (National Taiwan University, Taipei)  
C. N.R. Rao (Jawaharlal Nehru Centre for Advanced Science Research, India)  
S. Y. Tong (City University of Hong Kong, Hong Kong)  
T. Wong (US Army International Technology Center - Pacific, Japan)  
M. K. Wu (Institute of Physics, Academia Sinica, Taipei)  
S. S. Xie (Institute of Physics, CAS, Beijing)

## **Local Organizing Committee:**

- M. K. Fung (City University of Hong Kong, Hong Kong)  
H. P. Ho (Chinese University of Hong Kong, Hong Kong)  
C. S. Lee (City University of Hong Kong, Hong Kong)  
S. T. Lee (City University of Hong Kong, Hong Kong)  
D. D. D. Ma (City University of Hong Kong, Hong Kong)  
R. Renneberg (Hong Kong University of Science and Technology, Hong Kong)  
N. B. Wong (City University of Hong Kong, Hong Kong)  
M. S. Yang (City University of Hong Kong, Hong Kong)  
S. H. Yang (Hong Kong University of Science and Technology, Hong Kong)  
A. Zapien (City University of Hong Kong, Hong Kong)  
R. Q. Zhang (City University of Hong Kong, Hong Kong)  
W. J. Zhang (City University of Hong Kong, Hong Kong)

## **Conference Location:**

Venue: *Chan Kei Biu Lecture Theatre (LT-6)*  
4/F, Academic Building  
City University of Hong Kong  
83 Tat Chee Avenue  
Kowloon Tong  
Kowloon, Hong Kong

Phone No.: 852-2784-4209

Fax. No.: 852-2784-4696

**Sunday, June 3, 2007**

16:00 – 19:00

Registration

18:00 – 19:00

Opening Reception

19:00 – 21:30

Opening Dinner

## **Monday, June 4, 2007**

Breakfast (on your own)

08:30 – 09:00 Registration (continued)

09:00 – 09:15 Conference Welcome and Overview from the Chairs

### **Session I – Biological and Chemical Sensors I**

Session Chair: N. Lam, Argonne National Lab., USA

09:15 – 09:45 *Challenges and Opportunities in Electrically-Based Nanoscale Sensing*  
J. R. Hamers, University of Wisconsin-Madison, USA

09:45 – 10:15 *Wide Band Gap Materials for Multifunctional Bio and Chemical Sensors*  
A. L. Spetz, Linköping University, Sweden

10:15 – 10:45 *Integrated Chemistry and Biology Laboratory in a Stand-Alone Microchip*  
H. R. Tseng, University of California, Los Angeles, USA

10:45 – 11:00 Coffee Break

### **Session II – Chemistry of Nanomaterials I**

Session Chair: P. S. Weiss, The Pennsylvania State University, USA

11:00 – 11:30 *Chemical and Sensing Properties of Silicon Nanostructures*  
S. T. Lee, City University of Hong Kong, Hong Kong

11:30 – 12:00 *Monitoring Biochemical Processes with Group III-Nitride Devices*  
M. Eickhoff, M. Stutzmann, Technische Universität München, Germany

12:00 – 12:15 *Nanoscale Photovoltaics and Artificial Sight*  
E. Greenbaum, Oak Ridge National Laboratory, USA

12:15 – 12:30 Group photograph

12:30 – 14:00 Lunch

### **Session III – Biomedical Sensors and Devices**

Session Chair: N. A. Kotov, University of Michigan, Ann Arbor, USA

14:00 – 14:30 *Bionano Bullets for Drug Delivery*  
R. J. R. Hwu, National Tsing Hua University, Hsinchu

**Monday, June 4, 2007 (continued)**

- 14:30 – 14:45                      *Magnetic Color for Biomedical Applications*  
J. P. Wang, University of Minnesota, USA
- 14:45 – 15:00                      *Biomedical Applications of Multifunctional Composite Nanoparticles*  
Y. Hung, National Taiwan University, Taipei
- 15:00 – 15:15                      *Detection of HIV1 Virion Infectivity Factor with Piezoimmunosensors Based on Recombinant Single-chain and Single Domain Antibodies*  
J. M. Encarnação, Universidade do Algarve, Portugal
- 15:15 – 15:30                      Coffee Break

**Session IV - Nanoparticles and Carbon Nanotubes for Sensing Applications I**

Session Chair: K. P. Loh, National University of Singapore, Singapore

- 15:30-16:00                      *Magnetic Nanocrystals: from Preparations to Bio-applications*  
M. Y. Gao, Institute of Chemistry, Chinese Academy of Sciences, Beijing
- 16:00-16:30                      *Interactions of Lung Surfactants with Au and Ag Nanoparticles*  
N. O. Petersen, National Institute for Nanotechnology, Canada
- 16:30-17:00                      *Nanoparticle-based Biodetection: Enhanced Performance by Exploiting Nanoparticle -Biomolecules Interactions*  
C. H. Fan, Shanghai Institute of Applied Physics, Chinese Academy of Sciences, Shanghai
- 17:00-17:15                      *Hydrogen Sensors Fabricated from Palladium Nanoclusters*  
A Lassesson, Nano Cluster Devices Ltd., New Zealand
- 17:15-17:30                      *Electrical Detection of Biomolecules Using Nanoparticles*  
P. H. Chen, National Taiwan University, Taipei
- 17:30-17:45                      *Carbon Nanotube Based Sensors for Ammonia Gas and Real-time Organophosphate Detections*  
Q. Zhang, Nanyang Technological University, Singapore
- 17:45-18:00                      *Squid Systems for Immunomagnetic Detection with Magnetic Nanoparticles*  
H. C. Yang, Herng-Er Horng, National Taiwan University, Taipei
- 18:00-18:15                      *Carbon Nanotubes for Light Sensing*  
J. Q. Wei, Tsinghua University, Peking
- 18:15                                      Dinner

**Tuesday, June 5, 2007**

Breakfast (on your own)

**Session V - Biological and Chemical Sensors II**

Session Chair: J. R. Hamers, University of Wisconsin-Madison, USA

- 09:30 – 10:00                      *Interactions Between Nanomaterials and Biological Systems: Effects and Applications*  
M. S. Yang, City University of Hong Kong, Hong Kong
- 10:00 – 10:30                      *Using Nanotechniques to Explore Bacteria-host Cell Interaction*  
L. Hsu, National Chaio Tung University, Hsinchu
- 10:30 – 11:00                      *DNA-Programmed Scalable, Renewable Array of Nanoelectric-Redox Protein Transducers*  
J. Xu, Brown University, USA
- 11:00 – 11:15                      Coffee Break

**Session VI - Diamond Sensors and Devices**

Session Chair: O. Auciello, Argonne National Laboratory, USA

- 11:15 – 11:45                      *Diamond for Bio-sensing Applications*  
C. E. Nebel, AIST, Japan
- 11:45 – 12:15                      *Diamond Surfaces: A Novel Platform for Biosensors*  
J. A. Garrido, Technische Universität München, Germany
- 12:15 – 12:45                      *Ultra-Low Temperature Nano-Diamond Film Synthesis by Microwave Plasma Assisted Chemical Vapor Deposition*  
M. Hasegawa, National Institute of Advanced Industrial Science and Technology, Japan
- 12:45 – 14:00                      Lunch

**Session VII - Manipulation, Processing and Instrumentation**

Session Chair: A. L. Spetz, Linköping University, Sweden

- 14:00 – 14:30                      *Micro and Nanotopographical Influence on Protein Adsorption and Cellular Behaviour*  
M. Foss, University of Aarhus, Denmark
- 14:30 – 15:00                      *Single Molecule Study of Human Plasma Fibrinogen Adsorbed onto Silicon Surfaces*  
X. H. Kong, North Carolina State University, USA  
R. Nemanich, Arizona State University, USA



**Tuesday, June 5, 2007 (continued)**

- 15:00 – 15:15                      *Chemical Composition and Protein Adsorption of a Nano Functionally Graded Thin Film of Stainless Steel / Poly(tetrafluoroethylene)*  
J. Nunes, ICEMS, Portugal
- 15:15 – 15:30                      *Directed Metallization of Single Enzyme Molecules with Preserved Biocatalytic Activity*  
D. M. Hila, Tel Aviv University, Israel
- 15:30 – 15:45                      *Solid State Powder Processing and Mechanical Characteristics of Nanocrystalline Hydroxyapatite*  
H. Kimura, National Defense Academy, Japan

**Session VIII – Poster Session**

Session Chairs: M. K. Fung, City University of Hong Kong, Hong Kong; D. D. Ma, City University of Hong Kong, Hong Kong

- 15:45 – 17:30                      Posters are listed at the end of the program.
- 17:45                                      Dinner

Wednesday, June 6, 2007

Breakfast (on your own)

**Session IX - Chemistry of Nanomaterials II**

Session Chair: M. Stutzmann, Technische Universität München, Germany

09:30 – 10:00

*Designing, Measuring and Controlling Molecular- and Supramolecular-Scale Properties for Molecular Devices*  
P. S. Weiss, The Pennsylvania State University, USA

10:00 – 10:30

*Nanosensors for Online Monitoring of Water Supplies*  
S. F. Y. Li, National University of Singapore, Singapore

10:30 – 11:00

*The Neurochip: An Advanced Nanomaterial for the Development of Novel Biosensors and Functionally-directed Proteomics*  
A. M. Andrews, Pennsylvania State University, USA

11:15

**Excursion (including lunch & dinner)**

**Thursday, June 7, 2007**

Breakfast (on your own)

**Session X - Nanoparticles and Carbon Nanotubes for Sensing Applications II**

Session Chair: M. Hasegawa, National Institute of Advanced Industrial Science and Technology, Japan

- 09:30 - 10:00                    *Self-Organization and Molecular Assemblies of Nanoparticles and Nanowires*  
N. A. Kotov, University of Michigan, Ann Arbor, USA
- 10:00 – 10:30                    *Magnetic Nanoparticles and Their Applications in Biomedicine*  
H. E. Horng, National Taiwan Normal University, Taipei
- 10:30 – 11:00                    *Transistor Type DNA Sensor for SNPs Detection Using Diamond Surface*  
H. Kwarada, Waseda University, Japan
- 11:00 – 11:15                    *Electrical Detection of DNA and Gas Molecules by Carbon Nanotubes Network Transistors*  
L. J. Li, Nanyang Technological University, Singapore
- 11:15 – 11:30                    Coffee Break

**Session XI - Modelling and Computation**

Session Chair: R. Q. Zhang, City University of Hong Kong, Hong Kong

- 11:30 – 12:00                    *Characterizing the Mechanical Property of Nano-Structures Using Nanoindentation*  
Y. R. Jeng, National Chung Cheng University, Chia-Yi
- 12:00 – 12:30                    Atomic, electronic and optical properties of hybrid biomolecule-semiconductor nanostructures using the the density-functional based tight-binding method  
Th. Frauenheim, Universität Bremen, Germany
- 12:45 - 14:00                    Coffee Break

**Session XII – Chemistry of Nanomaterials III**

Session Chair: S. T. Lee, City University of Hong Kong, Hong Kong

- 14:00 – 14:30                    *Surface Nano-Engineering, Molecular Functionalization and Manipulation for Applications in Bio-electronics*  
M. Tornow, Technical University of Braunschweig, Germany
- 14:30 – 15:00                    *Composite Nanofibers for Biomedical Applications*  
C. T. Lim, National University of Singapore, Singapore

**Thursday, June 7, 2007** (continued)

15:00 – 15:15                      *Atomic and Electronic Properties of Bare and Hydrogen Passivated ZnO Nanowires*  
A. L. Rosa, Universität Bremen, Germany

15:15 – 15:30                      Coffee Break

**Session XIII – Chemistry of Nanomaterials IV**

Session Chair: M. Tornow, Technical University of Braunschweig, Germany

15:30 – 16:00                      *Design and Creation of Bioinspired Surfaces with Special Wettability*  
L. Jiang, Institute of Chemistry, Chinese Academy of Sciences, Beijing

16:00 – 16:15                      *A New Approach for Biosensing through CNT Arrays*  
N. Mureau, University of Surrey, UK

16:15 – 16:30                      *?-Pleated Non-native Protein Aggregates: from Alzheimer Disease to Building Blocks for Molecular Devices*  
W. Dzwolak, Institute of High Pressure Physics, Polish Academy of Sciences, Poland

17:00                                      Banquet

**Friday, June 8, 2007**

Breakfast (on your own)

**Session XIII - Diamond & Nanoparticles for Biodevices & Biosensors**

Session Chair: F.Y. Li, National University of Singapore, Singapore

- |               |  |
|---------------|--|
| 09:30 – 10:00 | <i>Science and Technology of Ultrananocrystalline Diamond Hermetic, Bioinert Coatings for Encapsulation of Implantable Artificial Retina Microchip and other Biodevices</i><br>O. Auciello, Argonne National Laboratory, USA |
| 10:00 – 10:30 | <i>Chemical Functionalization of Diamond</i><br>K. P. Loh, National University of Singapore, Singapore   |
| 10:30 – 10:45 | Coffee Break   |
| 10:45 – 11:15 | <i>Functional Nanoparticles for Theranostic Applications</i><br>D. B. Shieh, National Cheng Kung University, Tainan  |
| 11:15 – 11:45 | <i>Novel Core-Shell Magnetic Nanoparticles for Biological and Biomedical Applications</i><br>Y. Qiang, University of Idaho, USA  |
| 11:45 – 12:00 | <i>Functionalization of Nanoparticles for Biomolecule Immobilization in Optical Nanosensing</i><br>R Baltazer, Universidade do Algarve, Portugal   |
| 12:00 – 12:15 | <i>YVO4:Eu Nanoparticles as a New Fluorescent Label for Microarrays Imaging</i><br>J. Shen, Peking University, Beijing   |
| 12:15         | Closing Remark by Chairs   |
| 12:30         | Lunch  |