

Program

Innovative Dynamic Studies of Materials at the Nanoscale

June 29 – July 3, 2008
Gyeong-ju, Korea

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T: 1-718-260-3743 – F: 1-718-260-3754

E: info@eci.poly.edu – www.engconfintl.org

Innovative Dynamic Studies of Materials at the Nanoscale

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Sunday, 29 June 2008

- 16:00 – 18:00 Registration
18:00 – 21:30 Dinner and Welcome Party

Monday, 30 June 2008

- 07:00 – 08:00 Breakfast
08:10 – 08:30 Conference Opening Ceremony

Opening Remarks:
Dr. Dongwha Kum, President, Korea Institute of Science and Technology

Dr. Nghi Lam, Argonne National Laboratory

Prof. Robert Sinclair, Stanford University
Conference Chair

Session 1: Advanced Characterization Techniques

Session Chairs: Robert Sinclair and Dongwha Kum

- 08:30 – 09:00 THE 1Å DOUBLE ABERRATION CORRECTED IN SITU TEM/STEM PROJECT AT YORK
Pratibha Gai and Edward Boyes, University of York, UK
(Invited talk)
- 09:00 – 09:20 IN-SITU VAPOR SORPTION APPARATUS FOR SMALL ANGLE NEUTRON/X-RAY SCATTERING AND ITS APPLICATIONS
Man-Ho Kim, Korea Institute of Science Technology, Korea
- 09:20 – 09:40 SMALL-ANGLE NEUTRON AND X-RAY SCATTERING STUDY ON THE NANOSTRUCTURES OF STEELS
Masato Ohnuma *et al.*, National Institute for Materials Science, Japan
- 09:40 – 10:10 FEMTOSECOND X-RAY STUDIES OF NANOSCALE NUCLEATION DYNAMICS
Aaron Lindenberg *et al.*, Stanford University, USA
(Invited talk)
- 10:10 – 10:40 Break
- 10:40 – 11:10 DYNAMIC IN-SITU OBSERVATION OF MATERIALS RESPONSE AT FAR-FROM-EQUILIBRIUM USING MULTIBEAM HVEM
Seiichi Watanabe and Heishichirou Takahashi, Hokkaido University, Japan
(invited talk)

- 11:10 – 11:40 IN-SITU DYNAMIC STUDIES WITH STM-TEM AND AFM-TEM
Eva Olsson, Chalmers Institute of Technology, Sweden
(*Invited talk*)
- 11:40 – 12:00 UNPRECEDENTED ABILITY IN QUANTITATIVELY EXPLORING THE
MECHANICAL RESPONSE OF INDIVIDUAL NANO-STRUCTURES
INSIDE TEM
Zhiwei Shan, Hysitron Inc., USA
- 12:10 – 13:30 Lunch
- 13:30 – 13:50 NM-SCALE STRUCTURE AND DYNAMICS OF LEVITATED LIQUID
BORON AND SILICON
David L. Price *et al.*, Centre de Recherche sur les Matériaux à Haute
Température, France
- 13:50 – 14:20 DYNAMIC HIGH-RESOLUTION ELECTRON MICROSCOPY TO
PROBE THE SECRETS OF PHASE TRANSFORMATION
PHENOMENA IN CHALCOGENIDE ALLOYS
Se Ahn Song, Samsung Advanced Institute of Technology, Korea
(*Invited talk*)

Session 2: Computer Simulations

Session Chairs: Marie-Louise Saboungi and Dae-Hong Ko

- 14:20 – 14:50 QUANTUM CONDUCTANCE OF ULTRATHIN NANOWIRES,
NEGATIVE DIFFERENTIAL RESISTANCE OF MOLECULAR WIRES,
AND CARBON-BASED SPIN-VALVE DEVICES
Kwang S. Kim and Woo Youn Kim, Pohang University of Science and
Technology, Korea
(*Invited talk*)
- 14:50 – 15:20 MULTIMILLION-TO-BILLION ATOM MOLECULAR DYNAMICS
SIMULATIONS OF SHEAR DEFORMATION, FRACTURE AND
NANOINDENTATION IN SILICA GLASS
Rajiv Kalia *et al.*, University of Southern California, USA
(*Invited talk*)
- 15:20 – 15:40 ATOMIC SCALE UNDERSTANDING OF INTERFACIAL PHENOMENA
USING MOLECULAR DYNAMICS SIMULATION
Kwang-Ryeol Lee *et al.*, Korea Institute of Science and Technology,
Korea
- 15:40 – 16:00 MOLECULAR DYNAMICS STUDY OF IRRADIATION-INDUCED
STRUCTURAL CHANGE IN MAGNESIUM ALUMINATE SPINEL
COMPOUND
Syo Matsumura *et al.*, Kyushu University, Japan

16:00 – 16:20 OXYGEN VACANCY CLUSTERING IN PEROVSKITE OXIDES
Jaichan Lee *et al.*, Sungkyunkwan University, Korea

19:00 – 20:30 Dinner

Tuesday, 1 July 2008

07:00 – 08:30 Breakfast

Session 3: Nanotubes, Nanowires and Nanoparticles

Session Chairs: Toyohiko Konno and V. Lien Nguyen

08:30 – 09:00 IMAGING THE DEFECTS IN CARBON NANOSTRUCTURES
Kazutomo Suenaga and Sumio Iijima, National Institute of Advanced
Industrial Science and Technology, Japan
(*Invited talk*)

09:00 – 09:30 NANOSTRUCTURED MATERIALS DEVELOPMENT IN KOREA
Sang-Hee Suh, Center for Nanostructured Materials Technology, Korea
(*Invited talk*)

09:40 – 10:00 OXIDATION BEHAVIORS OF Si/Si_{1-x}Ge_x NANOWIRES
Sang-Yeon Kim *et al.*, Yonsei University, Korea

10:00 – 10:30 Break

Session 4: Biological / Polymeric Dynamics

Session Chairs: Seiichi Watanabe and Kee-Won Kwon

10:30 – 11:00 DYNAMICS OF SUGAR SOLUTIONS
Gerald Lelong *et al.*, Cornell University, USA
(*Invited talk*)

11:00 – 11:30 SURPRISING PARALLELS IN PROPERTIES BETWEEN
NANOPARTICLES AND PROTEINS
Nicholas A. Kotov, University of Michigan – Ann Arbor, USA
(*Invited talk*)

11:30 – 12:00 (*Session 6 preview*)
NOVEL POWDER PROCESSING FOR ADVANCED CERAMIC
COMPOSITES AS SOLID OXIDE FUEL CELL COMPONENTS
Hae-Weon Lee, Korea Institute of Science and Technology, Korea
(*Invited talk*)

12:10 – 13:50 Lunch

14:00 – 16:00

Poster Session

OSCILLATION DYNAMICS STUDY OF DOUBLE-WALLED CARBON NANOTUBE ENCAPSULATING COPPER NANOWIRE

Jeong Won Kang *et al.*, Chungju National University, Korea

ATOMIC AND ELECTRONIC STRUCTURES OF METAL/OXIDE INTERFACE

Yoshinori Suzuki *et al.*, Hokkaido University, Japan

RACTAL CHARACTERISTIC OF DENDRITE PATTE RN IN SOLIDIFYING MULTI-COMPONENT ALLOYS FORMED BY PHASE-FIELD SIMULATION

Kenichi Ohsasa and Toshihisa Itoh, Hokkaido University, Japan

MEASUREMENT OF FIBER ORIENTATION ANGLE USING INTERSECTION COUNTING METHOD

Jin-Woo Kim and Dong-Gi Lee, Chosun University, Korea

GROWTH OF AMORPHOUS SILICON OXIDE NANOWIRE FROM SILICON SUBSTRATE AS A FUNCTION OF Ti AMBIENT AND SURFACE TREATMENT OF Si

E. S. Oh *et al.*, Yonsei University, Korea

FORMATION OF METALLIC AND ALLOYED NANOBALLS BY SUBMERGED GLOW DISCHARGE AND ITS CONTROL

Shigeo Yatsu *et al.*, Hokkaido University, Japan

DYNAMIC MECHANICAL PROPERTY OF NANOCELLULOSE REINFORCED BIOCOMPOSITES

Seong Ok Han *et al.*, Korea Institute of Energy Research, Korea

MECHANICAL AND ELECTRICAL CHARACTERIZATION OF Cu-TiB₂ COMPOSITES FABRICATED BY TURBULENT IN-SITU MIXING PROCESS

Jonghoon Kim, Pusan National University, Korea

TRANSFORMATION OF C₆₀ FULLERENE INTO POLYMERIZED PHASE AND AMORPHOUS DIAMOND UNDER SHOCK COMPRESSION

Keisuke Niwase *et al.*, Hyogo University of Teacher Education, Japan

ATHERMAL MARTENSITIC TRANSFORMATION IN ZIRCONIA ALLOYS

Jae-Hwan Pee *et al.*, Korea Institute of Ceramic Engineering and Technology, Korea

EVALUATION OF MECHANICAL PROPERTIES OF Cu/Sn – Ag/Cu JOINTS FOR 3D PACKAGING

Byunghoon Lee *et al.*, Sungkyunkwan University, Korea

INVESTIGATION OF PHASE TRANSITION CHARACTERISTICS OF Ge₂Sb₂Te₅ and n-INCOPORATED Ge₂Sb₂Te₅

M. -H. Jang *et al.*, Yonsei University, Korea

FABRICATION AND PROPERTY OPTIMIZATION OF THIN FILM
SOLID OXIDE FUEL CELL COMPONENTS BY PULSED LASER
DEPOSITION.

Ho-Sung Noh *et al.*, Korea Institute of Science and Technology, Korea

CHARACTERIZATION OF MULTI-FILM DEPOSITED BIPOLAR
PLATES FOR A PEM (PROTON EXCHANGE MEMBRANE) FUEL
CELL APPLICATION

Gwang-Yeon Jeon *et al.*, Dongshin University, Korea

THE EFFECTS OF POST-ANNEALING TEMPERATURES ON
ELECTRICAL CHARACTERISTICS OF ZnO TFTS

B.-I. Hwang *et al.*, Sungkyunkwan University, Korea

HOLOGRAPHIC PATTERNING WITH CHALCOGENIDE MATERIALS
Yong Woon Koo *et al.*, Kwangwoon University, Korea

ACCUMULATION OF THERMALLY STABLE DEFECTS IN GRAPHITE
EXPOSED TO PLASMA IN THE TEXTOR TOKAMAK

Keisuke Niwase *et al.*, Hyogo University of Teacher Education, Japan

IN-SITU OBSERVATION OF NANOSTRUCTURAL BEHAVIOR IN Si
AND SUS BY IRRADIATION OF NS-PULSE LASER BY TEM.

Satoshi Katashima *et al.*, Hokkaido University, Japan

KINETICS ON PHASE TRANSFORMATION OF GST MATERIALS
CHARACTERIZED BY STATIC LASER TESTS

Kihoon Do, Yonsei University, Korea

Wednesday, 2 July 2008

07: 00 – 08:30 Breakfast

Session 5A: Phase Change Materials and Phase Transformations

Session Chair: Pratibha Gai

08:30 – 09:00 IN-SITU TEM STUDY OF PHASE-CHANGE NANOWIRES
Yi Cui, Stanford University, USA
(*Invited talk*)

09:00 – 09:20 OPTICAL INVESTIGATION ON Ag/Ge₁Se₁Te₂ THIN FILM FOR NEXT-
GENERATION MEMORY DEVICE APPLICATION
Hyun-Koo Kim *et al.*, Kwangwoon University, Korea

09:20 – 09:40 RECENT PROGRESS IN TEM OBSERVATIONS ON THE PHASE
TRANSFORMATION IN METALS AND ALLOYS
Toyohiko Konno, Tohoku University, Japan

09:40 – 10:00 DYNAMIC STUDY ON ABSORPTION AND CONDENSATION
BEHAVIOR OF SUPERSATURATED VACANCIES IN B2-TYPE
ALUMINIDES
Kiyosuke Yoshimi *et al.*, Tohoku University, Japan

10:00 – 10:30 PHASE SEPARATION AND RELATED MICROSTRUCTURAL EVOLUTION IN METALLIC GLASS ALLOYS
Do Hyang Kim, Yonsei University, Korea
(Invited talk)

10:30 – 11:00 Break

Session 5B: Switching Phenomena

Session Chair: Eva Olsson

11:00 – 11:30 SWITCHING TRANSPORT MECHANISMS IN A NEM-SET
Norihiko Nishiguchi, Hokkaido University, Japan
(Invited talk)

11:30 – 12:00 SWITCHING PHENOMENA IN MAGNETIC MATERIALS AND DEVICES STUDIED USING ELECTRON HOLOGRAPHY
Rafal Dunin-Borkowski, Technical University of Denmark, Denmark
(Invited talk)

12:00 – 12:30 NON CHARGE BASED MEMORIES FOR 10nm ~ 20nm TECHNOLOGY NODE AND THEIR SWITCHING MECHANISMS
U-In Chung, Samsung Electronics Co., Korea
(Invited talk)

12:30 – 13:30 Lunch

OPTIONAL AFTERNOON EXCURSION: Local Historic Sites (Bulguksa Temples, Seokkuram Grotto, Gyeongju Museum)

19:30 – 21:00 Dinner followed by social hour

Thursday, 3 July 2008

07:00 – 08:30 Breakfast

Session 6: Fuel Cells and Environmental Materials

Session Chairs: Hoo-Jeong Lee and Kyosuke Yoshimi

08:30 – 09:00 INFLUENCE OF NANO-IN-HOMOGENEITY IN DOPED CeO₂ SOLID ELECTROLYTES
Toshiyuki Mori *et al.*, National Institute for Materials Science, Japan
(Invited talk)

09:00 – 09:20 RECENT RESEARCH ACTIVITIES FOR MINIATURIZED SOLID OXIDE FUEL CELLS AT KOREA INSTITUTE OF SCIENCE AND TECHNOLOGY
Ji-Won Son, Korea Institute of Science and Technology, Korea

09:20 – 09:40 ANALYSIS OF THE TRANSIENT BEHAVIOR OF A PASSIVE AIR BREATHING DIRECT METHANOL FUEL CELL
Seungbum Ha *et al.*, Seoul National University, Korea

- 09:40 – 10:00 NANOPOROUS TiO₂ THIN FILM ON HOLLOW GLASS BEADS FOR THE REMOVAL OF ORGANIC POLLUTANTS IN WATER
Dong-Keun Lee, Gyeongsang National University, Korea
- 10:00 – 10:20 ELECTRODE POLARIZATION OF Y-DOPED BaZrO₃ WITH SEVERAL METAL ELECTRODES
Jong-Sung Park *et al.*, Korea Institute of Science and Technology, Korea
- 10:20 – 10:50 Break

Session 7: Nanoelectronics and Laser Dynamics

Session Chairs: Kwang-Ryeol Lee and Robert Sinclair

- 10:50 – 11:20 IN SEARCH OF “FOREVER”: HISTORICAL TRENDS AND FUTURE DIRECTIONS OF TRANSISTOR SCALING
Seok-Hee Lee, Intel Corporation, US
(Invited talk)
- 11:20 – 11:50 SMALL MOLECULAR ORGANIC NONVOLATILE MEMORY CELLS FABRICATED WITH IN SITU O₂ PLASMA OXIDATION
Jea-Gun Park *et al.*, Hanyang University, Korea
(Invited talk)
- 11:50 – 12:20 HOT-WALLED PULSED LASER DEPOSITION FOR CONTROLLED SYNTHESIS OF ZnO NANOWIRES
Yong-Won Song and Sang Yeol Lee, Korea Institute of Science and Technology, Korea
(Invited talk)
- 12:20 – 12:40 ULTRA-HIGH-SPEED OPTICAL SPECTROSCOPY IN TIME-WAVELENGTH TECHNIQUE WITH A STRETCHED PULSE SUPERCONTINUUM SOURCE
Dug Young Kim and Sucbei Moon, Gwangju Institute of Science and Technology, Korea
- 12:40 – 13:00 NANO-STRUCTURE IMBEDDED OPTICAL FIBERS AND THEIR APPLICATIONS IN EMERGING MARKETS
Kyunghwan Oh *et al.*, Yonsei University, Korea
- 13:00 – 14:30 Lunch
- 19:00 – 21:00 Conference Banquet

Korean Night

Friday, 4 July 2008

- 07:00 – 08:30 Breakfast and Departure