

# Third International Symposium on Atomically Controlled Fabrication Technology

November 24-26, 2010  
Osaka University Nakanoshima Center, Osaka, Japan

## Wednesday, 24 November 2010

14:00PM **Poster Session 1**

15:30PM **Tutorial Session**

16:30PM **Poster Session 2**

18:00PM **Welcome Party**

## Thursday, 25 November 2010

### **Session 1: "Advanced Optics and Photonics"**

- 9:10AM **Opening Remark** K. Yamauchi *Osaka University*
- 9:30AM 1.1 *Invited* – Next Generation Neutron Focusing Optics G. E. Ice<sup>1</sup>, O. M. Barabash<sup>1,2</sup> and J. W. L. Pang<sup>1</sup> <sup>1</sup>*Oak Ridge National Laboratory*  
<sup>2</sup>*University of Tennessee Knoxville*
- 10:10AM 1.2 *Invited* – High-speed Atomic Force Microscopy and Nano-visualization of Dynamic Processes and Structural Changes of Proteins T. Ando, T. Uchihashi and N. Kodera *Kanazawa University*
- 10:40AM 1.3 Development of a New High-speed Nano-profiler Using Normal Vector Tracing Method for Next-generation Ultraprecision Mirrors K. Endo<sup>1</sup>, J. Uchikoshi<sup>1</sup> and Y. Higashi<sup>2</sup> <sup>1</sup>*Osaka University*  
<sup>2</sup>*KEK*
- 11:05AM 1.4 Development and Application of High-resolution X-ray Diffraction Microscopy Using Advanced Mirror Optics Y. Takahashi *Osaka University*

11:25AM **Lunch**

### **Session 2: "Challenges in Catalytic Nanoscience"**

- 13:30PM 2.1 *Invited* – Catalysis Informatics T. Bligaard *Technical University of Denmark*
- 14:10PM 2.2 *Invited* – Growth Control of Single-Walled Carbon Nanotubes for Device Applications S. Maruyama *The University of Tokyo*
- 14:40PM 2.3 Promoting O<sub>2</sub> Activation on Metal Surfaces by Spin Manipulation H. Kasai and M. C. S. Escaño *Osaka University*
- 15:05PM 2.4 Theoretical Study of Electronic Properties at Organic/Metal Interfaces: Interface Dipole and Nature of Organic-metal Interaction S. Yanagisawa<sup>1</sup>, T. Saigo<sup>1</sup>, K. Toyoda<sup>2</sup>, I. Hamada<sup>3</sup>, K. Lee<sup>4</sup> and Y. Morikawa<sup>1</sup> <sup>1</sup>*Osaka University*  
<sup>2</sup>*Panasonic Corp.*  
<sup>3</sup>*Tohoku University*  
<sup>4</sup>*Rutgers University*

15:25PM **Break**

### **Session 3: Student Session**

- 15:45PM 3.1 Force Spectroscopy Measurements on Cu(110)-O Surface With Low Temperature Atomic Force Microscopy Y. Kinoshita, T. Satou, Y. Naitoh, Y. J. Li, and Y. Sugawara *Osaka University*
- 16:00PM 3.2 Development of Wavefront Measurement Method for Hard X-ray Adaptive Optics System T. Kimura<sup>1</sup>, S. Handa<sup>1</sup>, H. Mimura<sup>1</sup>, H. Yumoto<sup>2</sup>, H. Yokoyama<sup>1</sup>, Y. Sano<sup>1</sup>, K. Tamasaku<sup>1,3</sup>, Y. Nishino<sup>3</sup>, M. Yabashi<sup>2</sup>, T. Ishikawa<sup>2,3</sup> and K. Yamauchi<sup>1</sup> <sup>1</sup>*Osaka University*  
<sup>2</sup>*SPRING-8/JASRI*  
<sup>3</sup>*SPRING-8/RIKEN*
- 16:15PM 3.3 Thermal Robustness and Improved Electrical Properties of Ultrathin Germanium Oxynitride Gate Dielectric K. Kutsuki, I. Hideshima, T. Hosoi, T. Shimura and H. Watanabe *Osaka University*
- 16:30PM 3.4 Role of Correlation Effects in Many-Electron System: Toward Overcoming Unreliability Problems of Density Functional Theory M. Kojo and K. Hirose *Osaka University*

16:45PM	3.5	Impact of La and Al Composition Ratio on the Electrical Properties of La-Al-O Higher- <i>k</i> Gate Dielectrics	H. Arimura <sup>1</sup> , T. Ando <sup>1,2</sup> , S. L. Brown <sup>2</sup> , A. Kellock <sup>3</sup> , A. Callegari <sup>2</sup> , M. Copel <sup>2</sup> , R. Haight <sup>2</sup> , H. Watanabe <sup>1</sup> and V. Narayanan <sup>2</sup>	<sup>1</sup> Osaka University <sup>2</sup> IBM T. J. Watson <sup>3</sup> IBM Almaden
17:00PM	3.6	Processing Characteristics in Catalyst-Referred Etching of 4H-SiC (0001) Substrates	T. Okamoto <sup>1</sup> , Y. Sano <sup>1</sup> , K. Tachibana <sup>1</sup> , K. Arima <sup>1</sup> , A. N. Hattori <sup>1</sup> , K. Yagi <sup>2</sup> , J. Murata <sup>1</sup> , S. Sadakuni <sup>1</sup> and K. Yamauchi <sup>1</sup>	<sup>1</sup> Osaka University <sup>2</sup> Ebara Corp.
17:15PM	3.7	Simultaneous Measurement of Tunneling Current and Force of The Cu (110)-O Surface Using Low Temperature Noncontact AFM	Z. Ma, Y. Naitoh, Y. J. Li and Y. Sugawara	Osaka University
17:30PM	3.8	TEM Observation of Surface Atomic Structure of Cobalt Nanocatalysts Producing Graphite	T. Yahiro and Y. Takai	Osaka University

18:00PM **Banquet**

**Friday, 26 November 2010**

**Plenary Session**

9:00AM		State-of-the-art Wide Band-gap Semiconductor SiC for Power Devices	H. Matsunami	Innovation Plaza Kyoto, JST
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**Session 4: "Frontiers of Material Science and Device Physics in ULSI Technology"**

9:45AM	4.1	<i>Invited</i> – Can Electrons in Ge Move Faster than Those in Si ? - A Challenge to Ge CMOS -	A. Toriumi <sup>1,2</sup> , C. H. Lee <sup>1</sup> , S. K. Wang <sup>1</sup> , M. Yoshida <sup>1</sup> , T. Tabata <sup>1</sup> , T. Nishimura <sup>1,2</sup> , K. Nagashio <sup>1,2</sup> and K. Kita <sup>1,2</sup>	<sup>1</sup> The University of Tokyo <sup>2</sup> JST/CREST
10:25AM	4.2	<i>Invited</i> – First-principles Study of the Passivation of Ge Interfaces for Advanced MOSFETs	M. Houssa <sup>1</sup> , V. V. Afanas'ev <sup>1</sup> , A. Stesmans <sup>1</sup> , G. Pourtois <sup>2</sup> and M. M. Heyns <sup>2</sup>	<sup>1</sup> University of Leuven <sup>2</sup> IMEC
10:55AM	4.3	Photonic and Biosensing Devices Using Silicon Technologies	M. Morita, J. Uchikoshi and K. Arima	Osaka University
11:20AM	4.4	Fabrication of Shape Controlled Metal Nanodot Arrays by Autonomous Liquid-phase Nanoscale Processing as well as Their Charge Injection Characteristics for Floating Nanodot Gate Memory	N. Zettsu, S. Matsuura, A. Watanabe, K. Yamamura, T. Hosoi and H. Watanabe	Osaka University

11:40AM **Lunch**

**Session 5: "Innovative Technology for Post-silicon Materials and Devices"**

13:30PM	5.1	<i>Invited</i> – Application of Force Spectroscopy to Understand Atomic Contrast in Kelvin Probe Force Microscopy on Semiconductor Surfaces	O. Custance <sup>1</sup> , S. Sadewasser <sup>2</sup> , P. Jelinek <sup>3</sup> , C.K. Fang <sup>1</sup> , Y. Sugimoto <sup>4</sup> , M.Abe <sup>4</sup> and S. Morita <sup>4</sup>	<sup>1</sup> NIMS <sup>2</sup> Helmholtz Zentrum Berlin für Materialien und Energie <sup>3</sup> Academy of Sciences of the Czech Republic <sup>4</sup> Osaka Univ.
14:10PM	5.2	<i>Invited</i> – Plasmonic Light-Emitting Devices	T. Okamoto	RIKEN
14:40PM	5.3	Atom Manipulation and Force Spectroscopy on Cu(110)-O Surface with Low Temperature AFM	Y. Sugawara, Y. Kinoshita, Y. Naitoh and Y. J. Li	Osaka University
15:05PM	5.4	<i>Ab initio</i> Study on Transport Properties of Nanostructures	T. Ono	Osaka University

15:25PM **Break**

**Session 6: "Development in Sustainable Energy Technologies"**

15:45PM	6.1	Plasma Enhanced Chemical Transport Technique at High Pressure for Si Based Photovoltaic Device Fabrication - Technology Status and Prospect -	H. Ohmi	Osaka University
16:05PM	6.2	Development of Chemical Processing Methods for Silicon Carbide Wafering and Device Processing	Y. Sano, K. Yamamura, K. Arima and K. Yamauchi	Osaka University
16:25PM	6.3	Water Adsorption, Deliquescence and Ion Segregation of Alkali Halide Thin Films on SiO <sub>2</sub>	K. Arima	Osaka University

16:45PM **Closing remark**