



# 3<sup>rd</sup> ACCMS Working Group Meeting on Advances in Nano-device Simulation

Asian Consortium for Computational Materials Science ([ACCMS](#)) has entered into 10<sup>th</sup> year of its existence. Five successful conferences and four general meetings of virtual organization has boosted the computational materials research in the Asian region. In order to optimally utilize our resources and manpower, it is widely felt that we should have working group meetings on the emerging areas of materials simulation. Scientists not only from Asian region but also from all around the world had exchanged their state-of-the-art research results in the previous working group meetings in Japan, 2006 (on clusters and nanomaterials) and in Singapore, 2008 (on hydrogen storage materials).

In view of the rapidly growing demand of integrated simulation technology to design nano-devices and relevant processes, the third Working Group Meeting (ACCMS-WGM3) on "Advances in the Nano-device Simulation" will be held in Korea. The scope of this meeting will encompass fundamentals as well as application aspects of all process and device simulation studies ranging from future molecular devices, low-dimensional nano-devices to Si nano CMOS. Both bottom-up and top-down approaches to implement a nano-device are discussed.

## Topics covered will include (but will not be limited to)

- Quantum and Semi-Quantum Transport Simulation
- Structure and Property Simulation for Nanometer Scale Channel Stacks
- Defects and Interface Modeling for Nano-devices
- Modeling Technology for Low-dimensional Nano-devices
- Correlated and Spintronics Materials for Nano-devices
- Multiscale Simulation for Technology Driven CAD

**Dates** : March 31 – April 2, 2011

**Pre-Registration and Abstracts Submission : March 15<sup>th</sup>, 2011**

**Hotel Reservation : March 9<sup>th</sup>, 2011**

**Venue** : [Seogwipo KAL Hotel](#), [Jeju Island](#), KOREA

**Registration** : US\$ 200 (incl. Banquet and Guided Hiking of [Jeju Olle-gil](#))  
US\$ 250 (after March 15)

**Conference Website** : <http://accms-wgm3.kist.re.kr>





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## Advisory and Executive Committee :

Prof. Jisoon Ihm (Seoul National Univ., Korea) : Chair  
Prof. Yoshiyuki Kawazoe (IMR, Tohoku Univ., Japan) : Chair  
Prof. Gour Prasad Das (IACS, India) : Chair  
Prof. Young June Park (Seoul National Univ., Korea)  
Mr. Young-Kwan Park (Samsung, Korea)  
Dr. Suk Hee Han (KIST, Korea)  
Prof. Feng Yuan Ping (NUS, Singapore)  
Prof. Kee-Joo Chang (KAIST, Korea)  
Prof. Kaoru Ohno (Yokohama National Univ., Japan)  
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## Secretary General

Dr. Kwang-Ryeol Lee (KIST, Korea)

## Organizing Committee

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## Secretary

Ms. Joo-Hee Hur (KIST, Korea)

## Contact

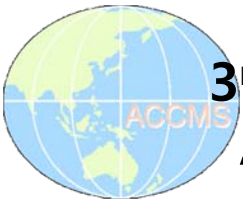
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## Sponsors

- Global KIST Program, [Korea Institute of Science and Technology](#)
- [NT based Information and Energy Technology Project](#), [NRF](#), Korea
- [The Korean Institute of Metals and Materials](#)



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## Invited Speakers

### • Advanced TCAD Technology for Nano Devices

- Prof. Young June Park (Seoul National Univ., Korea)  
*Transient simulation of the electrical double layer: a New path to bio-sensing*
- Prof. Asen Asenov (Univ. Glasgow, UK)  
*Simulation of statistical variability and reliability in advanced CMOS devices*
- Prof. Ziping Yu (Tsinghua Univ., China)  
*Density-gradient modeling and complex bandstructure simulation of tunneling current in device simulation*
- Dr. Terry Ma (Synopsys, USA)  
*The role of TCAD for developing present and future nano-devices*
- Dr. Young Kwan Park (Samsung Inc., Korea)  
*Advanced TCAD simulation beyond 1x nm devices*
- Prof. Mark Lundstrom (Purdue Univ., USA)  
*Computational Electronics in the 21<sup>st</sup> Century: Status, Challenges and Opportunities*
- Dr. Ohkura Yasuyuki (SELETE, Japan)  
*Development and challenge on 3D device and process simulation*
- Dr. Seong-Dong Kim (IBM Semicond. R&D Center, USA)  
*To be available*

### • Transport Simulation for Nano Devices

- Prof. Chen Hao (Fudan Univ., China)  
*Quantum transport in zigzag graphene nanoribbons*
- Prof. Hiroshi Mizuseki (Inst. Mater. Res., Tohoku Univ., Japan)  
*First-principles study on transport properties of nanoscale conjugated molecules*
- Prof. Hyoung Joon Choi (Yonsei Univ., Korea)  
*Self-energy corrected scattering-state approach for electrical and thermal transport properties in nanostructures*
- Prof. Yong-Hoon Kim (KAIST, Korea)  
*Resolving controversies on the multiple conductance peaks in single-molecule junction experiments by multiscale simulations*
- Prof. Mincheol Shin (KAIST, Korea)  
*Quantum transport of holes in nanoscale FETS: Dependence on channel orientation and impact of heavy-hole light-hole coupling*
- Dr. Sang-Uck Lee (LG Chemical., Korea)  
*Nanodesign and simulations toward nanoelectronic devices*
- Prof. Satoshi Watanabe (Univ. Tokyo, Japan)  
*Simulations on time-varying nanoscale electronic transport*



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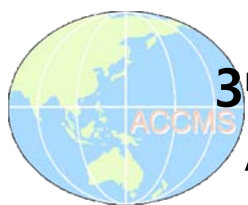
## Invited Speakers (Continue)

### • Process Optimization by Computer Simulation

- Prof. Heiji Watanabe (Osaka Univ., Japan)  
*Understanding and Control of Metal-Oxide-Semiconductor Interfaces for Advanced Nanoelectronics*
- Prof. Takano Watanabe (Waseda Univ., Japan)  
*Force field approaches for modeling oxide-semiconductor interface*
- Dr. Alexander Schmidt (Samsung Inc., Korea)  
*Atomistic stochastic simulation of front end process*
- Prof. Hiroshi Watanabe (Nat. Chiao Tung Univ., Taiwan)  
*On possibility for new interface state of Si-dot surrounded by oxide*
- Prof. Scott Dunham (Univ. Washington, USA)  
*Atomistic Modeling of Nanodevice Fabrication*
- Dr. Kwang-Ryeol Lee (KIST, Korea)  
*Reactive molecular dynamics simulation of gate oxide formation and its electronic structures*

### • Novel Materials for Next Generation Devices

- Prof. Jisoon Ihm (Seoul National Univ., Korea)  
*Anomalous current-voltage characteristics in defected carbon nanotubes*
- Prof. Yoshiyuki Kawazoe (Inst. Mater. Res., Tohoku Univ., Japan)  
*How to predict new novel materials for next generation devices with theoretical confidence?*
- Prof. Kee-Joo Chang (KAIST, Korea)  
*Role of O-vacancy defects in devices based on high-k dielectrics and amorphous oxide semiconductors*
- Prof. G. P. Das (IACS, India)  
*How to functionalize boron nitride sheet and nanotube for device applications*
- Prof. Yuan-Ping Feng (Nat. Univ. Singapore, Singapore)  
*Graphene-based spin logic gates*
- Dr. Hyunju Chang (KRICT, Korea)  
*First principle studies on interface models for HfO<sub>2</sub> gate stack*
- Prof. Umesh V. Waghmare (JNCASR, India)  
*To be available*
- Prof. Young Woo Son (KIAS, Korea)  
*Pseudo gauge fields in graphitic materials*
- Prof. Seungwu Han (Seoul Nat. Univ., Korea)  
*Ab initio approach to calculate capacitance of nanocapacitors*
- Prof. Gang Zhang (Peking Univ., China)  
*Simulation design of nanowires for thermoelectric device applications*
- Prof. Vijay Kumar (Vijay Kumar Foundation, India)  
*Atomic structure and band gap engineering in graphene-BN hybrid nanostructures*



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## Program at a Glance

	Mar. 30 (Wed)	Mar. 31 (Thu)	Apr. 1 (Fri)	Apr. 2 (Sat)
8:30		Opening		
9:00		Advanced TCAD Technology for Nano Devices I	Transport Simulation for Nano Devices I	Process Optimization by Computer Simulation I
9:30				
10:00				
10:30	Coffee Break			
11:00		Advanced TCAD Technology for Nano Devices II	Transport Simulation for Nano Devices II	Process Optimization by Computer Simulation II
11:30				
12:00				
12:30	Lunch			
14:00	Registration	Novel Materials for Next Generation Devices I	Novel Materials for Next Generation Devices II	Guided Hiking (Jeju Ole-gil)
14:30				
15:00				
15:30				
16:00		Coffee Break		
16:30		Poster Session	Novel Materials for Next Generation Devices III	
17:00				
17:30				
18:00				
19:00	Reception	Banquet		