

MANA International Symposium 2026

Frontier of Semiconductors and Neuromorphic Materials



Plenary speaker
James Hone
Professor of Mechanical
Engineering
Columbia University

October 8-9, 2026

Auditorium, WPI-MANA Bldg., Namiki-site,
National Institute for Materials Science(NIMS)
1-1 Namiki, Tsukuba, Ibaraki 305-0044 JAPAN

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DAY 1 **10.8**

Opening Session

9:00-9:10 opening remarks

9:10-11:50 Session1 2D Semiconductors

Plenary Talk

9:10-10:10 Quantum Circuits and Applications of 2D Material **James Hone** (Professor, Columbia University)



Photo session & Coffee Break



10:30-11:00 Defect Suppression in CVD-grown Monolayer Transition Metal Dichalcogenides
Yi Wan (Assistant Professor, National University of Singapore)

11:00-11:30 MOCVD-Grown MoS₂ Wafers as a Transfer-Free Platform for Top-Gate Devices
Kosuke Nagashio (Professor, The University of Tokyo)

11:30-11:50 Solid-phase epitaxy of NbSe₂ electrodes on WSe₂ for p-type FETs
Ryotaro Sakakibara (Researcher, MANA, NIMS)



Lunch

13:30-14:50 Session2 Oxide Semiconductors

13:30-14:00 Advanced oxide semiconductor transistor with gate-all-around nanosheet structure
Masaharu Kobayashi (Professor, The University of Tokyo)

14:00-14:30 Metal oxide-based thin-film transistors and thermal transistors
Hiromichi Ohta (Professor, Hokkaido University)

14:30-14:50 Interface engineering of ferroelectric HfO₂-based devices using oxide semiconductor interfacial layer
Takashi Onaya (Researcher, MANA, NIMS)



Coffee Break

15:20-16:40 Session3 Group IV Semiconductors

15:20-15:50 Toward Heterogeneous Ge CFETs: Wafer-Bonded Front-End Devices and Monolithic BEOL-Compatible SnO/IGZO
Yao-Jen Lee (Professor, National Yang Ming Chiao Tung University)

15:50-16:20 Materials and Device Technology Development Using a 300 mm Pilot Line for Si Nanosheet Gate-All-Around Transistors
Toshifumi Irisawa (Team Leader, AIST)

16:20-16:40 High-Hole-Mobility Diamond Transistor
Takahide Yamaguchi (Principal Researcher, MANA, NIMS)



Coffee Break

17:00-18:30 Poster Session

18:30-20:30 Banquet

Host Organization

Research Center for Materials Nanoarchitectonics (MANA), NIMS

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DAY 2 10.9

9:00-10:20 Session4 Organic semiconductors

9:00-9:30 Organic electrochemical transistors and artificial synapses based on conducting polymer blends
Felix Sunjoo Kim (Professor, Chung-Ang University)

9:30-10:00 Low-Noise Wearable Sweat Sensing with Flexible Complementary Organic Circuits
Takahumi Uemura (Professor, Osaka University)

10:00-10:20 Tailoring Low-Dimensional Organic Electronics via Precise Control of Molecular Self-Assembly
Shunto Arai (Independent Researcher, NIMS)



10:30-11:50 Session5 Interconnection

10:30-10:50 Perspectives of CoSn kagome metal as interconnects for advanced semiconductor nodes
Tomoya Nakatani (Principal Researcher, MANA, NIMS)

10:50-11:20 Photochemical Bond-Scission-Driven Surface Activation of Copper by 172 nm Vacuum Ultraviolet Irradiation
Jun Mizuno (Professor, National Cheng Kung University)

11:20-11:50 BBCube™ Large-Scale 3DI using WOW/COW Hybrid Processes
Takayuki Ohba (Professor, Institute of Science Tokyo)



13:00-14:50 Session6 Neuromorphic 1 Iontronics-based neuromorphic computing

13:00-13:30 From Iontronic Materials to Neuromorphic Systems: Memristive Devices for Intelligent Hardware
Seung Ju Kim (University of Southern California)

13:30-14:00 Harnessing intrinsic dynamics of memristive nanowire networks for reservoir computing
Zdenka Kuncic (Professor, The University of Sydney)

14:00-14:30 Neuromorphic, In-memory, and Reservoir Computing as Foundations for Future AI electronics
Takao Marukame (Professor, Hokkaido University)

14:30-14:50 Ion-Gating Reservoirs for Sensor-Integrated Neuromorphic Edge AI
Daiki Nishioka (ICYS Research Fellow, NIMS)



15:10-16:30 Session7 Neuromorphic 2 Spintronics-based neuromorphic computing

15:10-15:40 Magnetic Vortices as a Platform for Magnonic Neuromorphic Computing
Christopher Heins (Helmholtz-ZDR)

15:40-16:10 Recent progress in spin-wave reservoir computing
Akira Hirose (Professor, The University of Tokyo)

16:10-16:30 Advancing spin wave utilization toward the realization of physical reservoir computing devices
Ryo Iguchi (Senior Researcher, MANA, NIMS)

16:40-16:50 Closing

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