



**The AIMR International Symposium 2016  
(AMIS2016)  
Program & Abstracts**

**“Harmonious Collaborations between Mathematics and Materials  
Science”**

**February 21 (Sunday) The Westin Sendai**

<b>Registration</b>	<b>16:00 -</b>
<b>Reception</b>	<b>17:00 - 19:00</b>

**February 22 (Monday) Sendai International Center**

<b>Registration</b>	<b>08:30 -</b>
<b>Opening Remarks</b>	<b>09:00 - 09:20</b> at HAGI (2nd floor) <b>Susumu Satomi</b> , President of Tohoku University <b>Toshio Kuroki</b> , WPI Program Director <b>Motoko Kotani</b> , Director of AIMR

<b>Opening Session 09:20 - 12:10</b> at HAGI (2nd floor)		
<b>Chair: Motoko Kotani</b>		
Mon. - 1	<b>09:20 - 09:50</b>	<b>Alexander S. Mikhailov</b> (Fritz Haber Institute of the Max Planck Society) “Design Principles of Molecular Machines”
Mon. - 2	<b>09:50 - 10:20</b>	<b>Akira Fujishima</b> (Tokyo University of Science) “Water photolysis and photocatalysis”
<b>Coffee Break 10:20 - 10:40</b>		
Mon. - 3	<b>10:40 - 11:10</b>	<b>Teruo Kishi</b> (ISMA) “Materials Integration of Structural Materials”
Mon. - 4	<b>11:10 - 11:40</b>	<b>Kenichiro Itami</b> (ITbM, Nagoya University) “Single-molecule carbon nanotube, nanoribbon, and a new form of carbon”
Mon. - 5	<b>11:40 - 12:10</b>	<b>Li-Jun Wan</b> (AIMR) “Two-Dimensional Organic Materials-From Non-Covalent Bonding to Covalent Bonding”

**Lunch/ Poster Session\*/ Free Discussion 12:10 - 14:20**

**\*The posters are displayed until 14:20 on February 23 at SAKURA 1 (2nd floor).**

<b>Session 1      14:20 - 15:50    at HAGI (2nd floor)</b>		
<b>-Mathematics for Materials Science-</b>		
<b>Chair: Yasumasa Nishiura</b>		
Mon. - 6	<b>14:20 – 14:50</b>	<b>Andrea Louise Bertozzi</b> (University of California Los Angeles) “Singular behavior in interfacial problems from material science ”
Mon. - 7	<b>14:50 – 15:20</b>	<b>Matthew Kahle</b> (The Ohio State University) “Topology of the phase space of a hard spheres gas”
Mon. - 8	<b>15:20 – 15:50</b>	<b>Jan Carl Budich</b> (University of Innsbruck) “Strongly Correlated Topological Insulators”

**Coffee Break            15:50 – 16:10**

<b>Session 2      16:10 – 17:40    at HAGI (2nd floor)</b>		
<b>-Computation and Modeling for Materials-</b>		
<b>Chair: Tomasz Dietl</b>		
Mon. - 9	<b>16:10 – 16:40</b>	<b>Mikio Furuta</b> (The University of Tokyo) “Topological Invariants and Partial Differential Equations”
Mon. - 10	<b>16:40 – 17:10</b>	<b>Shinji Tsuneyuki</b> (The University of Tokyo) “Atomistic Modeling of Materials from First Principles”
Mon. - 11	<b>17:10 – 17:40</b>	<b>Mark Owen Robbins</b> (Johns Hopkins University) “Contact, Friction and Adhesion from Atomic to Macroscopic Scales”

**Poster Reception at SAKURA 1 (2nd floor) 17:50 – 18:50**

## February 23 (Tuesday) Sendai International Center

<b>Session 3</b> <b>09:00 – 10:30</b> at HAGI (2nd floor)		
<b>-Energy Materials and Devices I-</b>		
<b>Chair: Thomas Gessner</b>		
Tue. - 1	<b>09:00 – 09:30</b>	<b>Zhong Lin Wang</b> (Georgia Institute of Technology) “Triboelectric nanogenerator for self-powered systems and large-scale blue energy”
Tue. - 2	<b>09:30 – 10:00</b>	<b>Yury Gogotsi</b> (Drexel University) “Experimental and Computational Study of Synthesis of 2D Carbides (MXenes) and Their Electrochemical Energy Storage”
Tues. - 3	<b>10:00 – 10:30</b>	<b>Seiji Samukawa</b> (AIMR) “High Efficiency Nano Energy Devices Using Bio-template Ultimate Top-down Process”

**Coffee Break**                      **10:30 – 10:50**

<b>Session 4</b> <b>10:50 – 12:20</b> at HAGI (2nd floor)		
<b>-Energy Materials and Devices II-</b>		
<b>Chair: Tomokazu Matsue</b>		
Tue. - 4	<b>10:50 – 11:20</b>	<b>Chun-Yen Chang</b> (National Chiao Tung University) “New Horizon of FinFETs with Internal Gate and Negative Capacitance”
Tue. - 5	<b>11:20 – 11:50</b>	<b>Kiyoshi Kanamura</b> (Tokyo Metropolitan University) “New Generation Lithium Batteries by Using Li Metal Anode”
Tue. - 6	<b>11:50 – 12:20</b>	<b>Tetsuya Osaka</b> (Waseda University) “Energy Materials for LIB and its Control System”

**Lunch/ Poster Session\*/ Free Discussion**    **12:20 - 14:20**

**\*The posters are displayed until 14:20 on February 23 at SAKURA 1 (2nd floor).**

<b>Session 5</b> <b>14:20 – 15:50</b> at HAGI (2nd floor)		
<b>-Materials Physics-</b>		
<b>Chair: Katsumi Tanigaki</b>		
Tue. - 7	<b>14:20 – 14:50</b>	<b>John Michael David Coey</b> (Trinity College Dublin) “Giant orbital paramagnetism at the surface of oxide insulators”
Tue. - 8	<b>14:50 – 15:20</b>	<b>Peter B Littlewood</b> (Argonne National Laboratory) “Competition between charge order and superfluidity in

		polaritons and polarons”
Tue. - 9	<b>15:20 – 15:50</b>	<b>Hilbert von Löhneysen</b> (Karlsruhe Institute of Technology) “Entropy Landscape of Materials with Strong Electronic Correlations Near Quantum Criticality”

**Coffee Break 15:50 - 16:10**

<b>Session 6 16:10 – 17:40</b> at HAGI (2nd floor)		
<b>-Soft Materials-</b>		
<b>Chair: Hiroyuki Isobe</b>		
Tue. - 10	<b>16:10 – 16:40</b>	<b>James J. Watkins</b> (University of Massachusetts Amherst) “Electronic and Optical Hybrid Materials via Self-Assembly and Nanoimprint Lithography”
Tue.- 11	<b>16:40 – 17:10</b>	<b>Tomokazu Matsue</b> (AIMR) “High-Resolution Electrochemical Imaging for Biomaterials”
Tue.- 12	<b>17:10 – 17:40</b>	<b>Kazue Kurihara</b> (AIMR) “Development of Surface Forces Measurement for Materials Science”

**Banquet at SAKURA 17:50 – 19:20**

## February 24 (Wednesday) Sendai International Center

<b>Session 7      09:00 – 10:30</b> at HAGI (2nd floor)		
<b>-Catalyses/Porous Materials-</b>		
<b>Chair: Dmitri V. Louzguine</b>		
Wed. - 1	<b>09:00 – 09:30</b>	<b>Mingwei Chen</b> (AIMR) “Three-dimensional Bicontinuous Nanoporous Materials for Energy Related Applications”
Wed. - 2	<b>09:30 – 10:00</b>	<b>Tadafumi Adschiri</b> (AIMR) “Supercritical Route for Green Materials (Nano Catalyst) ”
Wed. - 3	<b>10:00 – 10:30</b>	<b>Naoki Asao</b> (AIMR) “Fabrication and Application of Fine Metal Oxide 1D-Nanomaterials for Green Chemistry”

**Coffee Break      10:30 - 10:50**

<b>Session 8      10:50 - 12:20</b> at HAGI (2nd floor)		
<b>-Inorganic Materials/Nano-Particles/Surface and Interface-</b>		
<b>Chair: Taro Hitosugi</b>		
Wed. - 4	<b>10:50 - 11:20</b>	<b>Matthew Jonathan Rosseinsky</b> (The University of Liverpool) “Design of Advanced Materials?”
Wed. - 5	<b>11:20 - 11:50</b>	<b>Chang-Beom Eom</b> (University of Wisconsin-Madison) “Oxide Nanoelectronics”
Wed. - 6	<b>11:50 - 12:20</b>	<b>Yuichi Ikuhara</b> (AIMR) “Grain Boundary Atomic Structures and <i>In Situ</i> TEM observation of Dislocation/GB Interaction”

<b>Poster Award Ceremony</b>	<b>12:20 - 12:30</b>
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<b>Closing Remarks</b>	<b>12:30- 12:40</b> <b>Masaru Tsukada</b> , Administrative Director of AIMR
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