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The 9th International Symposium on Surface Science (ISSS-9)
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**Program Table**

**Nov. 29 (Mon)**

**Break / Breakout Session**

**Plenary 1**

29aA-PL  H. Peng 9:20-10:20

**Break / Breakout Session**

**Plenary 2**

29aA-PL  M. Scheffler 17:00-18:00

**Break / Breakout Session**

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<td>18:00-18:20</td>
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Welcome Message

Welcome to the 9th International Symposium on Surface Science, ISSS-9, organized by the Japan Society of Vacuum and Surface Science (JVSS), Public Interest Incorporated Association. This symposium takes place from November 29 to December 1, 2021, online. At first ISSS-9 was planned to hold in Takamatsu, Kagawa, Japan, but due to the COVID-19 pandemic, we decided to hold the ISSS-9 as an online-meeting. Technical program of the ISSS-9 includes eight basic sessions; Surface and interface structures, Data-driven surface science, Nanotechnology and nanomaterials, Surface chemistry, Physics at surfaces and thin films, Advanced surface engineering and characterization, Vacuum technology, Biomaterial interfaces, Energy and environmental science, and five focused topical ones; Cutting-edge of data-driven surface science, Operando surface science, Breakthroughs in 2D materials, Surface science in hydrogenomics, Vacuum and surface technology of big science.

In 1989, the Surface Science Society of Japan (SSSJ, it was later merged with the Vacuum Society of Japan on April, 2018 for the founding of JVSS) organized the ISSS-1 -New Developments and Trends in Surface Science- as the 10-year anniversary of SSSJ, which launched international activities of the society. Through the symposia in 1996 and 1999, SSSJ began to organize the international symposium every three years from 2005. The last symposium, the 8th International Symposium on Surface Science (ISSS-8) was held at the Tsukuba International Congress Center (EPOCHAL TSUKUBA) in Tsukuba, Ibaraki, Japan in 2017, where we had 692 participants from 21 countries. Today, ISSS is one of the largest international conferences held in Japan in the field related to science and nanotechnology at surfaces and interfaces.

The Heinrich Rohrer Medal, which is composed of the Grand Medal and the Rising Medal, was established in 2013 to celebrate Dr. Rohrer’s great achievements in surface science. The medals are awarded to outstanding researchers in this symposium. We express our gratitude to the IBM Research - Zurich Lab, JEOL Ltd., Scienta Omicron, Inc., and UNISOKU Co., Ltd for their contribution to fundraising. In particular, we would like to express sincere thanks to Ms. Rose-Marie Rohrer, Dr. Rohrer’s wife, for her thoughtful support and huge donation.

We would like to thank the Japan Society for the Promotion of Science (JSPS) for financial support. We hope you will enjoy the exciting sessions, scientific discussion during the whole meeting.

Sincerely,

Hiroshi Daimon
Conference Chair, ISSS-9 2021
Plenary Speakers

Matthias Scheffler (Fritz Haber Institute, Germany)
Artificial Intelligence for Surface Science and Heterogeneous Catalysis: Learning Rules and Creating Maps of Materials Properties

Huisheng Peng (Fudan University, China)
Fiber Sensors and Systems

Yoshihiro Iwasa (The University of Tokyo, Japan)
Emergent van der Waals heterostructures of transition metal dichalcogenides

Andreas Heinrich (Ewha Womans University, Korea, The 3rd Heinrich Rohrer Medal (Grand Medal))
Investigating the Quantum Magnetism of Atoms on Surfaces with Scanning Tunneling Microscopy

Invited Speakers

Takashi Toyao (Hokkaido University)
Toward Discovery of Novel Heterogeneous Catalysts using Extrapolative Machine Learning Method

Kenji Nagata (NIMS)
Bayesian Estimation for Spectral Analysis

Joshua C. Agar (Lehigh University)
Real-Time Physics-Constrained Machine Learning in Multimodal Scanning Probe Microscopy

Seungwu Han (Seoul National University)
Multi-scale simulation of atomic layer deposition of W and TiN thin film

Nongnuch Artrith (Columbia University and Brookhaven National Laboratory)
Modelling of Complex Energy Materials with Machine Learning

Peter Amann (Stockholm university)
Catalytic Reactions Explored by the High Pressure X-ray Photoelectron Spectroscopy (HPXPS) Endstation POLARIS

Jian Wang (Peking University)
The observation of in-plane quantum Griffiths singularity in two-dimensional crystalline superconductors

Kehui Wu (CAS Beijing)
Manipulation of Quantum Well States in Two-dimensional Semiconductors

Yuanbo Zhang (Fudan University)
Electronic Properties of Novel Two-dimensional Materials

Hiroshi Sakai (KEK)
The advanced technologies of Energy Recovery Linac (ERL)

Eshraq Al-Dmour (MAX-IV)
MAX IV Vacuum System: Design and Operation.

Oleg B. Malyshev (ASTeC, STFC Daresbury Laboratory)
Non-evaporable getter coating development

Paolo Milani (University of Milan)
All-Printed Green Micro-Supercapacitors Based on a Natural-derived Ionic Liquid for Flexible Transient Electronics
<table>
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<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Nov. 29 (Mon)</td>
<td>Beatriz Roldán Cuenya (Fritz Haber Institute of the Max Planck Society)</td>
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<tr>
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<td>Dynamic Catalysts under Operando Conditions</td>
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<td>Nov. 29 (Mon)</td>
<td>Jörg Libuda (Friedrich Alexander University)</td>
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<td>Complex model interfaces for energy storage and conversion: From surface science to the solid/liquid and the electrified interface</td>
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<tr>
<td>Nov. 30 (Tue)</td>
<td>Yossi Partiel (Hebrew University of Jerusalem Israel)</td>
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<td>Chiral molecules and the electron spin</td>
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<td>Nov. 30 (Tue)</td>
<td>Stefan Eisbitt (Max-Born-Institut)</td>
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<td>Ultrafast optical generation and control of magnetic skyrmions</td>
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<tr>
<td>Dec. 1 (Wed)</td>
<td>Marco Rolandi (University of California, Santa Cruz)</td>
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<td>Bioelectronic devices for control of cell function</td>
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<tr>
<td>Dec. 1 (Wed)</td>
<td>Xiaojie Duan (Peking University)</td>
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<td>Materials and technologies for soft and multi-modal neural interfacing</td>
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<tr>
<td>Dec. 1 (Wed)</td>
<td>Tzu-En Lin (National Chiao Tung University)</td>
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<td>Electrochemical detection and cleaning of the contaminated contact lens by using scanning electrochemical microscopy (SECM)</td>
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<td>Dec. 1 (Wed)</td>
<td>Andrew A. Gewirth (University of Illinois at Urbana-Champaign)</td>
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<td>Controlling CO₂ Electrolyzer Reactivity Using Alloy and Polymer-modified Electrodes</td>
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<td>Dec. 1 (Wed)</td>
<td>Scott L. Anderson (The University of Utah)</td>
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<td>Size- and Composition-Selected Cluster Catalysts and Electrocatalysts</td>
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<td>Dec. 1 (Wed)</td>
<td>Clemens Walther (Leibniz University Hannover)</td>
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<td>Quasi non-destructive ultra-trace characterization and isotope imaging of natural and anthropogenic nanoparticles by SN MS</td>
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<td>Dec. 1 (Wed)</td>
<td>Jerzy Sadowski (Brookhaven National Laboratory)</td>
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<td>Spectro-Microscopy of Twisted Bilayer Graphene Structures</td>
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<td>Dec. 1 (Wed)</td>
<td>Michael Trenary (University of Illinois at Chicago)</td>
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<td>Selective hydrogenation reactions over a Pd-Cu(111) single-atom alloy studied with ambient pressure infrared spectroscopy</td>
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<td>Dec. 1 (Wed)</td>
<td>Ikutaro Hamada (Osaka University)</td>
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<td>Adsorption and reaction of formic acid on Cu(111): The importance of the intermolecular interaction</td>
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<td>Dec. 1 (Wed)</td>
<td>Masashi Nakamura (Chiba University)</td>
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<td>Effect of interfacial hydrophilicity/hydrophobicity on the fuel cell reactions</td>
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<td>Dec. 1 (Wed)</td>
<td>Alec Wodtke (Max-Planck-Institut)</td>
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<td>Pump-probe experiments with neutral matter: A new approach to the kinetics of surface reactions</td>
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<tr>
<td>Dec. 1 (Wed)</td>
<td>Vincent Baglin (CERN)</td>
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<td>Qualifications for the upgraded High-Luminosity Large Hadron Collider Vacuum System</td>
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<td>Dec. 1 (Wed)</td>
<td>Stefan Wippermann (Max-Planck-Institut)</td>
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<td>Electrified surfaces at constant electrode potential: an ab initio perspective</td>
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<td>Dec. 1 (Wed)</td>
<td>Li-Chyong Chen (National Taiwan University)</td>
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<td>Probing the Photo-catalytic CO₂ Reduction on Low-dimensional Nano-catalysts via in situ and Operando Spectroscopies</td>
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</tbody>
</table>
Jörg Kröger (Technische Universität Ilmenau)
Quantum excitations and forces explored by scanning probe methods

Ulrich Höfer (Philipps-Universität Marburg)
Ultrafast Dynamics of Lightwave-Driven Currents in Topological Surface States

Takashi Ito (Japan Atomic Energy Agency)

Nobuyuki Ishida (NIMS)
Dynamically visualizing battery reactions by operando Kelvin probe force microscopy

Jinghua Guo (Lawrence Berkeley National Laboratory)
Operando soft x-ray spectroscopy characterization of surfaces and interfaces

Jan-Gerrit Horstmann (University of Göttingen)
Ultrafast Probing and Coherent Vibrational Control of a Surface Structural Phase Transition

Soo-Hyon Phark (IBS)
Double Electron Spin Resonance of Engineered Atomic Structures on a Surface

Giovanna Fragneto (Institut Laue-Langevin)
Structural Characterization of Biomembranes by Neutron Scattering

Takashi Kumagai (IMS, The 3rd Heinrich Rohrer Medal (Rising Medal))
Atomic-Scale Optical Spectroscopy in Plasmonic Scanning Tunneling Microscope Junctions
The Third Awarding of The Heinrich Rohrer Medals

February 1, 2020
The Japan Society of Vacuum and Surface Science (JVSS)

It is our great pleasure to announce the winners of the third awarding of The Heinrich Rohrer Medals. The Medal was established after the name of Late Dr. Heinrich Rohrer, one of the Laureates of Nobel Prize in Physics in 1986, for recognizing researchers who have made the world-top level achievements in the fields of nanoscience and nanotechnology.

The 3rd Heinrich Rohrer Medal –Grand Medal–
- Andreas Heinrich, Ewha Womans University, Korea
  “For his ground-breaking development of scanning tunneling microscope methods to study the spin properties of magnetic atoms on surfaces for revealing the quantum nature of the magnetism at the atomic scale”

The 3rd Heinrich Rohrer Medal –Rising Medal–
- Takashi Kumagai (born in 1984), Fritz Haber Institute of the Max Planck Society, Germany
  “For his outstanding achievements in the field of near-field physics and chemistry in plasmonic STM junctions ”

Award Committee Member
- Seizo Morita (Osaka University, Japan, Committee Chair)
- Flemming Besenbacher (Aarhus University, Denmark)
- Masaharu Oshima (Tokyo University, Japan)
- Heike E. Riel (IBM Zurich, Switzerland)
- Wolf-Dieter Schneider (EPFL, Switzerland)
- Patrick Soukiassian (University of Paris-Sud/Orsay, France)
- Joseph A. Stroscio (National Institute of Standard Technology, U.S.A.)
- Roland Wiesendanger (University of Hamburg, Germany)

Award Ceremony
The award ceremony will be held at The 9th International Symposium on Surface Science, ISSS-9 (https://www.jvss.jp/issss9/), which is organized by The Japan Society of Vacuum and Surface Science (JVSS). The laureates will deliver the award lectures on their research achievements during ISSS-9.
Official Collaborators and Sponsors

Operated with

IBM Research – Zurich IBM Research Europe

Cosponsored by

JEOL Ltd., Scienta Omicron Inc., UNISOKU Co., Ltd.

Awards for Young Researchers

ISSS-9 conference will offer poster awards, titled “Young Researchers’ Award”, on a competitive basis. Anyone 36 years old or younger on November 14, 2021, is encouraged to apply as eligible.

The award winners will be selected by the participants’ voting during the poster session. We request the applicant to prepare one screen poster that summarizes the research. This will help the voting by many participants.

We plan to announce the winners during the conference. The winner is recommended to submit a conference paper to publish the work widely.

Instructions for presentations

The conference presentation language is English.

<Oral Presentations>

All the oral presentations will take place at online rooms.

Presentation time

Duration of the individual types are summarized in the following table. Short questions or comments are made in the discussion time of 5 mins after each presentation.

<table>
<thead>
<tr>
<th>Type</th>
<th>Talk</th>
<th>Discussion</th>
<th>Total</th>
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<tr>
<td>Contributed</td>
<td>15 min</td>
<td>5 min</td>
<td>20 min</td>
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<tr>
<td>Invited</td>
<td>35 min</td>
<td>5 min</td>
<td>40 min</td>
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<tr>
<td>Plenary</td>
<td>55 min</td>
<td>5 min</td>
<td>60 min</td>
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Breakout session

Break time is shared with breakout sessions to have more discussion with the speakers.
**Preparation room**

Additional online rooms will be prepared to meet participants and to check the appearance of their presentation files.

**<Poster presentations>**

The poster sessions will take place online in the evening (19:00-20:40 JST) on Nov. 30 and in the morning (10:20-12:00 JST) on Dec. 01.

An online room will be offered to each poster presentation. The presentation style is flexible and the poster can be described with a conventional A0 poster, an oral-presentation-style slide show, or a movie.

In addition to the above-mentioned presentation material, we recommend the presenter to prepare one screen page that summarizes the research. This will help to make discussions with many participants.
Committees

**Conference Chair**

Hiroshi Daimon (Japan)

**International Organizing Committee**

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<thead>
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<th>Chair</th>
<th>D. Fujita (Japan)</th>
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<tr>
<td>E. Bauer (USA)</td>
<td>Y. Iwasawa (Japan)</td>
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<td>C.-S. Chang (Taiwan)</td>
<td>W. Knoll (Austria)</td>
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<td>S. Chiang (USA)</td>
<td>S. Morita (Japan)</td>
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<td>R. Garcia (Spain)</td>
<td>E. Meyer (Switzerland)</td>
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<td>P. Soukiassian (France)</td>
<td>K. Takayanagi (Japan)</td>
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<td>M. Tsukada (Japan)</td>
<td>Q.-K. Xue (China)</td>
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**International Program Advisory Board**

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<td>M. S. Altman (Hong Kong)</td>
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<td>W. Ho (USA)</td>
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<td>R. Berndt (Germany)</td>
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<td>F. Besenbacher (Denmark)</td>
<td>J. Hou (China)</td>
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<td>C. Bai (China)</td>
<td>G.-Y. Hsiung (Taiwan)</td>
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<td>J. J. Boland (Ireland)</td>
<td>H. J. Kang (Korea)</td>
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<td>T.-C. Chiang (USA)</td>
<td>B. Kasemo (Sweden)</td>
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<td>M. Kawai (Japan)</td>
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<td>Z. Dong (China)</td>
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<td>S. D. Evans (UK)</td>
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<td>H.-J. Freund (Germany)</td>
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<td>A. Fujishima (Ireland)</td>
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<td>G. Pacchioni (Italy)</td>
<td>A. A. Saranin (Russia)</td>
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<td>M. Scheffler (Germany)</td>
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<td>J. A. Stroscio (USA)</td>
<td>S. Tougaard (Denmark)</td>
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<td>M. A. van Hove (Hong Kong)</td>
<td>A. T. S. Wee (Singapore)</td>
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<td>J. M. van Ruitenbeek (Netherlands)</td>
<td>P. S. Weiss (USA)</td>
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<td>R. A. Wolkow (Canada)</td>
<td>H. W. Yeom (Korea)</td>
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<td>A. V. Zotov (Russia)</td>
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**Steering Committee**

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<th>K. Fukui Osaka Univ.</th>
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<td>Vice-Chair</td>
<td>K. Fukutani Univ. Tokyo</td>
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<td>Secretaries</td>
<td>K. Watanabe Kyoto Univ.</td>
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<td>I. Tanabe Osaka Univ.</td>
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<td>Treasures</td>
<td>H. Okuyama Kyoto Univ.</td>
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<td>Treasures</td>
<td>R. Kokawa Shimadzu</td>
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Program
Chair  I. Matsuda *Univ. Tokyo*
Vice-Chairs  H. Kondoh *Keio Univ.*
Vice-Chairs  T. Mizoguchi *Univ. Tokyo*
Vice-Chairs  R. Tero *Toyoashi Univ. Tech.*
Vice-Chairs  T. Uchihashi *NIMS*
Advisory  Y. Hasegawa *Univ. Tokyo*

Publication
Chair  A. Hirano-Iwata *Tohoku Univ.*
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Vice-Chairs  T. Sugimoto *IMS*

Local Arrangement
Chair  H. Onishi *Tohoku Univ.*
Vice-Chairs  T. Ishii *Kagawa Univ.*
Vice-Chairs  N. Takahashi *Kagawa Univ.*
Vice-Chairs  T. Okuda *Hiroshima Univ.*

Exhibition
Chair  R. Oiwa *ScientaOmicron*
Vice-Chairs  S. Hasegawa *Univ. Tokyo*
Vice-Chairs  Y. Miyatake *Unisoku*
Vice-Chairs  R. Tamoshi *Hitach Hightech*
Vice-Chairs  H. Yamada *JEOL*
Member  T. Sato *JEOL*

Audit
T. Ogino *Yokohama Natl. Univ.*

International Organizing Committee
Chair  D. Fujita (Japan)
E. Bauer (USA)  Y. Iwasawa (Japan)  P. Soukiassian (France)
C.-S. Chang (Taiwan)  W. Knoll (Austria)  K. Takayanagi (Japan)
S. Chiang (USA)  S. Morita (Japan)  M. Tsukada (Japan)
R. Garcia (Spain)  E. Meyer (Switzerland)  Q.-K. Xue (China)
A. Heinrich (Korea)  M. Oshima (Japan)
Sponsors

• The Japan Society for the Promotion of Science (JSPS) for Grants-in-Aid for Scientific Research

Supporting Organizations

ISSS-9 is supported by
• The Japan Society of Applied Physics
• The Japanese Society of Microscopy
• The Surface Finishing Society of Japan
• The Electrochemical Society of Japan
• The Mass Spectrometry Society of Japan
• The Spectroscopical Society of Japan
• The Society of Chemical Engineers, Japan
• The Society of Powder Technology, Japan
• Japan Society of Powder and Powder Metallurgy
• The Society of Materials Science, Japan
• The Materials Science Society of Japan
• The Japan Institute of Light Metals
• Japanese Society of Tribologists
• The Japan Society of Mechanical Engineers
• The Institute of Electrical Engineers of Japan
• The Institute of Electronics, Information, and Communication Engineers
• The Society of Polymer Science, Japan
• Japan Vacuum Industry Association
• The Institute of Image Information and Television Engineers
• Cryogenics and Superconductivity Society of Japan
• The Japan Titanium Society
• Semiconductor Equipment Association of Japan
• The Japan Society of Plasma Science and Nuclear Fusion Research
• The Japan Society for Precision Engineering
• The Society of Nano Science and Technology
• The Crystallographic Society of Japan
• The Japanese Association for Crystal Growth
• Particle Accelerator Society of Japan
• The Atomic Collision Society of Japan
• The Japanese Society for Synchrotron Radiation Research
• The Iron and Steel Institute of Japan
• Atomic Energy Society of Japan
### Nov. 29 (Mon)

**Online Room A, B, C, D**

#### 29aA  
**Plenary Session**  
Chair: I. Matsuda (The Univ. of Tokyo)  
H. Peng  
*Fudan Univ., China*

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#### 29aA  
**Cutting-edge of data-driven surface science**  
Chair: Y. Ando (National Inst. of Advanced Industrial Science and Technology)  
J. C. Agar  
*Lehigh Univ., USA*

N. Artrith  
*Utrecht Univ., The Netherlands*

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#### 29pA  
**Cutting-edge of data-driven surface science**  
Chair: M. Kotsugi (Tokyo Univ. Sci.)  
T. Toyao, S. Mine, S. Takakusagi, I. Takigawa, and K. Shimizu  
1*Hokkaido Univ., Japan, 2Kyoto Univ., Japan, 3RIKEN, Japan*

**13:40-14:00  29p-A-2 Data-driven approaches for materials characterization: core-loss spectroscopy and surface adsorption**  
T. Mizoguchi, K. Shibata, E. Suzuki, and K. Kikumasa  
*The Univ. of Tokyo, Japan*

**14:00-14:20  29p-A-3 Unsupervised Learning for Identifying Surface Inhomogeneity on Electronic Structures of High-Tc Cuprate**  
H. Iwasawa, T. Ueno, T. Masui, and S. Tajima  
1*Synchrotron Radiation Research Center, National Institutes for Quantum and Radiological Science and Technology, Japan, 2Hiroshima Synchrotron Radiation Center, Hiroshima Univ., Japan, 3Kindai Univ., Japan, 4Osaka Univ., Japan*

**14:20-15:00  29p-A-4 (I) Multi-scale simulation of atomic layer deposition of W and TiN thin film**  
S.Kim, H. An, S. Oh and S. Han  
*Seoul National Univ., Republic of Korea*

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#### 29pA  
**Cutting-edge of data-driven surface science**  
Chair: K. Hukushima (The Univ. of Tokyo)  
M. Shiga and S. Muto  
1*Gifu Univ., Japan, 2RIKEN, Japan, 3Nagoya Univ., Japan*

**15:40-16:00  29p-A-6 Automatic analysis of RHEED patterns using machine learning techniques**  
A. Yoshinari, Y. Iwasaki, M. Kotsugi, and N. Nagamura  
1*Tokyo Univ. of Science, Japan, 2National Inst. for Materials Science, Japan, 3JST PRESTO, Japan*
16:00-16:40  29pA-7 (I)  Bayesian Estimation for Spectral Analysis
   K. Nagata
   National Inst. for Materials Science, Japan

Online Room B

29aB  Biomaterial interfaces
Chair: T. Miyake (Waseda Univ.)
10:40-11:20  29aB-1 (I)  Bioelectronic devices for control of cell function
   M. Rolandi
   Department of Electrical and Computer Engineering Univ. of California, USA

11:20-11:40  29aB-2  A wireless, stretchable sensor lens for intraocular pressure measuring
   T. Xiao¹, Q. Zhang¹, T. Takamatsu¹, L. Hu¹ and T. Miyake¹,²
   ¹Waseda Univ., Japan, ²JST-PRESTO, Japan

11:40-12:00  29aB-3  Liquid-ordered phase formation in freestanding bilayer lipid membranes by
   modifying the edge shape of microwell aperture
   A. Oshima¹, M. Yamaguchi¹ and K. Sumitomo²
   ¹NTT Basic Research Laboratories and Bio-Medical Informatics Research Center, NTT
   Corporation, Japan, ²Univ. of Hyogo, Japan

29pB  Biomaterial interfaces
Chair: R. Tero (Toyohashi Univ. Tech.)
13:00-13:40  29pB-1 (I)  Materials and technologies for soft and multi-modal neural interfacing
   X. Duan¹, G. Li¹, S. Zhao¹, X. Liu¹, L. Lu¹ and Z. Liang²
   ¹Peking Univ., China, ²Inst. of Neuroscience, CAS Center for Excellence in Brain Sciences
   and Intelligence Technology, Chinese Academy of Sciences, China

13:40-14:00  29pB-2  Transient fibrous nascent adhesion at initial stage of cell adhesion visualized on a
   plasmonic metasurface
   S. T. Lee, T. Kuboki, S. Kidoaki, Y. Aida, S. Ryuzaki, Y. Arima and K. Tamada
   Kyushu Univ., Japan

14:00-14:20  29pB-3  Non-mydriatic near-infrared fundus imaging with light illumination from
   electric contact lens
   Y. Cui¹, K. Shimizu¹ and T. Miyake¹,²
   ¹Waseda Univ., Japan, ²PRESTO, Japan Science and Technology Agency, Japan

14:20-15:00  29pB-4 (I)  Electrochemical detection and cleaning of the contaminated contact lens by
   using scanning electrochemical microscopy (SECM)
   T.-E. Lin¹, Y.-T. Hsu¹, Y. Zhu², S. Darvishi² and H. Girault²
   ¹College of Electrical and Computer Engineering, National Yang Ming Chiao Tung Univ.,
   Taiwan, ²École Polytechnique Fédérale de Lausanne, Switzerland

29pB  Biomaterial interfaces
Chair: T. Shimanouchi (Okayama Univ.)
15:20-15:40  29pB-5  Establishment of a method for visualizing nanometer-scale three-dimensional
   structures of chromosomes by three-dimensional atomic force microscopy
   R. Kojima¹, K. Miyazawa¹, M. Meguro², T. Sumikama¹, K. Imadate¹, N. Okano¹, S. Horike²,
   K. Hirahara¹ and T. Fukuma¹
   ¹Kanazawa Univ., Japan, ²Research Center for Experimental Modeling of Human Disease,
   Japan, ³Osaka Univ., Japan
15:40-16:00 29pB-6  Specific Detection of Biological Nanoparticles by Microparticles with Molecularly-coated Surface under Optical Condensation in Microflow System


1Graduate School of Science, Osaka Prefecture Univ., Japan, 2Research Inst. for Light-induced Acceleration System (RILACS), Osaka Prefecture Univ., Japan, 3Graduate School of Engineering, Osaka Prefecture Univ., Japan, 4Osaka Univ., Japan

16:00-16:40 29pB-7 (I)  Structural Characterization of Biomembranes by Neutron Scattering

G. Fragneto
Institut Laue-Langevin, France

29aC  Physics at surfaces and thin films
Chair: Y. Yamashita (National Inst. for Materials Science)

10:40-11:00 29aC-1  Temperature dependence of internal magnetic field on the Fe₃O₄(111) surface
K. Asakawa, T. Kawauchi and K. Fukutani

1Inst. of Industrial Science, the Univ. of Tokyo, Japan, 2Tokyo Univ. of Agriculture of Technology, Japan, 3Japan Atomic Energy Agency (JAEA), Japan

11:00-11:20 29aC-2  Spin polarization measurement of metastable He atoms scattered from Fe₃O₄(100)
H. Maruyama, M. Kurahashi, K. Asakawa and A. Hatakeyama

1Tokyo Univ. of Agriculture and Technology, Japan, 2National Inst. for Materials Science, Japan

11:20-11:40 29aC-3  Multiferroic interfaces studied by first-principles electron theory
Y. Gohda, R. C.-Amaral and A. M. Yatmeidhy

Tokyo Tech, Japan

11:40-12:00 29aC-4  Organic Ferroelectric Tunnel Junctions at Nanoscale
P. Viswanath, T. Ikeda, K. K. H. De Silva and M. Yoshimura

Surface Science Laboratory, Graduate School of Engineering, Toyota Technological Inst., Japan

29pC  Physics at surfaces and thin films
Chair: T. Kinoshita (Japan Synchrotron Radiation Research Inst.)

13:00-13:20 29pC-1  Recent Achievements in Materials Science at SACLA
Y. Kubota

RIKEN SPring-8 Center, Japan

13:20-13:40 29pC-2  Photothermal perfect absorbers based on the extraordinary high refractive index of semimetal bismuth for spectroscopic infrared photodetection
O. S. Handegard, D. H.-Pinilla, T. D. Dao, N. Furuhata, Y. Wada and T. Nagao

1Hokkaido Univ., Japan, 2International Center for Materials Nanoarchitectonics (MANA), National Inst. for Materials Science (NIMS), Japan, 3Research Center for Functional Materials, National Inst. for Materials Science (NIMS), Japan

13:40-14:00 29pC-3  Spectrally-selective ultra-narrowband devices with multilayer photonic structures
D. H. Pinilla, N. Furuhata and T. Nagao

1International Center for Materials Nanoarchitectonics (NIMS), Japan, 2Hokkaido Univ., Japan

14:00-14:20 29pC-4  Interfacial Atomic Structures and Interface States at SiO₂/4H-SiC
Y. Yamashita, E. D. Indari and R. Hasunuma

1NIMS, Japan, 2Kyusyu Univ., Japan, 3The Univ. of Tsukuba, Japan
14:20-14:40 29pC-5  Comparison of the oxidation reaction kinetics between SiO$_2$/n- and p-Si(001) interfaces
Y. Tsuda$^1$, S. Ogawa$^2$, A. Yoshigoe$^1$, T. Sakamoto$^1$ and Y. Takakuwa$^1$
$^1$MSRC, JAEA, Japan, $^2$SRIS, Tohoku Univ., Japan, $^3$μSIC, Tohoku Univ., Japan

14:40-15:00 29pC-6  Controlled 2D Materials Growth via Impurity Surface Segregation
D. Fujita
National Inst. for Materials Science, Japan

29pC  Physics at surfaces and thin films
Chair: Y. Kubota (RIKEN SPring-8 Center)

15:20-15:40 29pC-7  Quantitative analysis of energy loss process for the core level intensities in Hard X-ray Photoemission
T. Konishi$^1$, S. Ueda$^2$ and T. Kinoshita$^3$
$^1$Chiba Univ., Japan, $^2$National Inst. for Materials Science (NIMS), Japan, $^3$Japan Synchrotron Radiation Research Inst.(JASRI), Japan

15:40-16:00 29pC-8  Angle-resolved Electron Energy-loss Measurements on the Single Crystal Surface of an Organic Semiconductor Pentacene
Y. Nakayama$^1$, F. C. Bocquet$^2$, R. Tsuruta$^1$, S. Soubatch$^2$ and F. S. Tautz$^2$
$^1$Tokyo Univ. of Science, Japan $^2$Forschungszentrum Jülich GmbH, Germany

16:00-16:20 29pC-9  Measurement of LUMO Band Structure of Organic Semiconductor
H. Sato, H. Orio and H. Yoshida
Chiba Univ., Japan

16:20-16:40 29pC-10  Evidence of Polaron Formation in Organic Semiconductor Proved by Temperature-Dependent HOMO/LUMO bandwidths
S. A. Ab. Rahman$^1$, Y. Yamada$^1$, H. Sato$^1$, H. Ishii$^2$ and H. Yoshida$^1$
$^1$Chiba Univ., Japan, $^2$Tsukuba Univ., Japan

29aD  Nanotechnology and nanomaterials
Chair: J. T. Sadowski (Brookhaven National Laboratory)

10:40-11:00 29aD-1  Graphene nanoribbon growth on Au(100)
M. Yano and H. Asaoka
ASRC, JAEA, Japan

11:00-11:20 29aD-2  Carrier scattering mechanism of CVD graphene
Y. Okigawa$^1$, T. Masuzawa$^2$, K. Watanabe$^3$, T. Taniguchi$^4$ and T. Yamada$^1$
$^1$AIST, Japan, $^2$Shizuoka Univ., Japan, $^3$NIMS, Japan

11:20-11:40 29aD-3  Van Hove Singularity in Thickness Controlled Li-Intercalated Graphene
S. Ichinokura$^1$, M. Toyoda$^1$, M. Hashizume$^1$, K. Horii$^1$, S. Kusaka$^1$, S. Ideta$^1$, K. Tanaka$^2$, R. Shimizu$^1$, T. Hitosugi$^1$, S. Saito$^1$ and T. Hirahara$^1$
$^1$Department of Physics, Tokyo Inst. of Technology, Japan, $^2$UVSOR Facility, Inst. for Molec. Sci., Japan, $^3$Department of Applied Chemistry, Tokyo Inst. of Technology, Japan

11:40-12:00 29aD-4  Interface hot carrier dynamics in quasi-crystalline twisted bilayer graphene and epitaxial graphene
Y. Zhao$^1$, T. Suzuki$^1$, T. Iimori$^1$, S. J. Ahn$^1$, J. R. Ahn$^2$, J. Xu$^1$, Q. Ren$^1$, T. Kanai$^1$, J. Itatani$^1$, K. Okazaki$^1$, S. Shin$^1$, H. Fukidome$^2$, S. Tanaka$^5$, F. Komori$^1$ and I. Matsuda$^1$
$^1$Inst. for Solid State Physics, Univ. of Tokyo, Japan, $^2$Sungkyunkwan Univ., Republic of Korea, $^3$Office of Univ. Professor, the Univ. of Tokyo, Japan, $^4$Tohoku Univ., Japan, $^5$Kyushu Unive., Japan
29pD  Surface and interface structures
Chair: A. Takayama (Waseda Univ.)

13:00-13:20  29pD-1  Electronic Structure of Borophane, studied by X-ray spectroscopy
X. Zhang1, Y. Tsujikawa1, M. Niibe2, N. T. Cuong1, M. Horio1, S. Okada1, T. Kondo3 and
I. Matsuda1
1The Univ. of Tokyo, Japan, 2Univ. of Hyogo, Japan, 3Univ. of Tsukuba, Japan

R. Kawamura1, R. Ishibiki1, Y. Fujimoto2, T. Goto1, S. Ito1, T. Fujita1, T. Tokunaga2, M. Miyauchi1, S. Imura2, A. Yamamoto1, D. Umeyama1, S. Tominaka6, S. Saito1, H. Hosono2,6 and T. Kondo1,2
1Univ. Tsukuba, Japan, 2Tokyo Tech., Japan, 3Kouchi Univ. Tech., Japan, 4Nagoya Univ, Japan, 5TAT, Japan, 6NIMS, Japan

13:40-14:00  29pD-3  Nanoscale Turing patterns in bismuth monolayer
Y. Fuseya1, H. Katsuno2, K. Behnia3 and A. Kapitulnik4
1Univ. of Electro-Communications, Japan, 2Hokkaido Univ., Japan, 3ESPCI Paris, PSL
Research Univ., France, 4Stanford Univ., USA

14:00-14:20  29pD-4  Revealing complete three-dimensional structure of Si(110)×2-Bi surface
H. Aoyama1 and T. Abukawa1,2
1IMRAM, Tohoku Univ., Japan, 2SRIS, Tohoku Univ., Japan

14:20-14:40  29pD-5  Catalytic activity of FeN4 and CoN4 embedded graphene for oxygen reduction reaction: a comparative density functional theory study
A. F. Z. Abidin1 and I. Hamada
Osaka Univ., Japan

14:40-15:00  29pD-6  Density functional theory on nitrogen (N) doped graphdiyne as electrocatalyst for oxygen reduction reaction (ORR)
Y. Wang1, T. N.Pham1, L. Yan1 and Y. Morikawa1,2,3
1Department of Precision Engineering, Graduate School of Engineering, Osaka Univ., Japan,
2Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto Univ., Japan,
3Research Center for Ultra-Precision Science and Technology, Graduate School of
Engineering, Osaka Univ., Japan, 4Northeast Normal Univ., China

29pD  Advanced surface engineering and characterization
Chair: J. Peng (Tsukuba Univ.)

15:20-16:00  29pD-7 (I)  Double Electron Spin Resonance of Engineered Atomic Structures on a Surface
S.-h. Phark1,2,3, Y. Chen1,2, H. T. Bui1,2, Y. Wang1,2, M. Haze1, C. Wolf1,3, J. Kim1,3, C. P. Lutz2, A. J. Heinrich1,3 and Y. Bae1,3
1Center for Quantum Nanoscience, IBS, Republic of Korea, 2IBM Almaden Research Center,
3Stanford Univ., USA, 4Ewha Womans Univ., Republic of Korea

16:00-16:20  29pD-8  Effects of magnetron sputtering on ion bombardment of Sm-Fe thin films
M. Kamiya1, R. Kataoka2, S. Ono2, H.T. Uchida1, Y. Matsumura1 and R. Gemma1
1Course of Applied Science, Graduate School of Engineering, Tokai Univ., Japan, 2Department
of Nuclear Engineering, School of Engineering, Tokai Univ., Japan, 3Course of Mechanical
Engineering, Graduate School of Engineering, Tokai Univ., Japan

16:20-16:40  29pD-9  Observing Soft X-ray Second Harmonic Generation from a GaAs Crystal
T. Sumi1, T. Senoo1, M. Horio1, Y. Kabota1, Y. Hirata1, K. Yamamoto1,2, Y. Sato1, T. Wada1, Y. Tsujikawa1, X. Zhang1, H. Akai1, S. Owada2,6, K. Tono2,6, M. Yabashi2,6 and I. Matsuda1
1The Univ. of Tokyo, Japan, 2RIKEN SPring-8 Center, Japan, 3National Defense Academy
of Japan, Japan, 4Inst. for Molecular Science, Japan, 5SOKENDAI, the Graduate Univ. for
Advanced Studies, Japan, 6Japan Synchrotron Radiation Research Inst., Japan
## 29pA  Plenary Session

Chair: I. Matsuda (The Univ. of Tokyo)

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<tr>
<td>17:00-18:00</td>
<td>29pA-PL</td>
<td>Artificial Intelligence for Surface Science and Heterogeneous Catalysis: Learning Rules and Creating Maps of Materials Properties</td>
<td>M. Scheffler</td>
<td>The NOMAD Laboratory at the Fritz Haber Inst. of the Max Planck Society, Germany</td>
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## 29nA  Vacuum and surface technology of big science

Chair: Y. Tanimoto (KEK)

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<td>19:00-19:40</td>
<td>29nA-1 (I)</td>
<td>Non-evaporable getter coating development</td>
<td>O. Malyshev and R. Valizadeh</td>
<td>UKRI/STFC Daresbury Laboratory, UK</td>
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<td>20:20-21:00</td>
<td>29nA-3 (I)</td>
<td>Qualifications for the upgraded High-Luminosity Large Hadron Collider Vacuum System</td>
<td>V. Baglin</td>
<td>European Organisation for Nuclear Research CERN, Switzerland</td>
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## 29nB  Surface and interface structures

Chair: P. Krüger (Chiba Univ.)

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<tr>
<td>19:00-19:40</td>
<td>29nB-1 (I)</td>
<td>Ultrafast Probing and Coherent Vibrational Control of a Surface Structural Phase Transition</td>
<td>J. G. Horstmann¹, H. B.-Clemens¹, B. Wit¹, F. Kurtz¹, G. Storeck¹ and C. Ropers¹²</td>
<td>¹W. Physical Inst., Univ. of Göttingen, Germany, ²Max Planck Inst. for Biophysical Chemistry, Germany</td>
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<tr>
<td>19:40-20:00</td>
<td>29nB-2</td>
<td>Investigation of Subnanometer-Scale Structures of Ionic Liquid/Au Electrode Interfaces by 3D-SFM</td>
<td>T. Ikarashi¹, R. Sakakibara¹, T. Yoshino¹, K. Miyazawa¹, T. Sumikama¹, K. Miyata¹, S. Shimizu², Y. Iwasa³, and T. Fukuma¹</td>
<td>¹Kanazawa Univ., Japan, ²CRIEPI, Japan, ³The Univ. of Tokyo, Japan, ⁴RIKEN CEMS, Japan</td>
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<tr>
<td>20:00-20:20</td>
<td>29nB-3</td>
<td>Analyses of the interfacial ionic liquid on Au(111) electrode using electrochemical XPS through the precursor film region</td>
<td>T. Sato¹, H. Ueda¹, A. Takahashi¹, Y. Hirota¹, I. Tanabe¹, A. Imanishi¹ and K. Fukui¹²</td>
<td>¹Osaka Univ., Japan, ²Inst. for Molecular Science, Japan</td>
</tr>
<tr>
<td>20:20-21:00</td>
<td>29nB-4 (I)</td>
<td>Electrified surfaces at constant electrode potential: an ab initio perspective</td>
<td>F. Deißenbeck, C. Freysoldt, M. Todorova, J. Neugebauer, F. Deißenbeck and S. Wippermann</td>
<td>Max-Planck-Institut für Eisenforschung GmbH, Germany</td>
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</table>
Online Room C

29nC  Surface chemistry

Chair: H. Kondoh (Keio Univ.)

19:00-19:40  29nC-1 (I)  Complex model interfaces for energy storage and conversion: From surface science to the solid/liquid and the electrified interface
   J. Libuda
   *Interface Research and Catalysis, Universität Erlangen-Nürnberg, Germany*

19:40-20:00  29nC-2  Single-molecule precise laser nanospectroscopy
   *RIKEN, Japan, PRESTO, JST, Japan, Inst. for Molecular Science, Japan, Osaka Prefecture Univ., Japan, Hokkaido Univ., Japan, The Univ. of Tokyo, Japan, Osaka Univ, Japan*

20:00-20:20  29nC-3  Atomic-scale investigation of single-molecule photocurrent generation
   *SISL, RIKEN, Japan, PRESTO, JST, Japan, Inst. for Molecular Science, Japan, Advanced Elements Chemistry Laboratory, RIKEN, Japan, The Univ. of Tokyo, Japan, Seoul National Univ., Republic of Korea*

20:20-20:40  29nC-4  Surface action spectroscopy with inert gas messenger atoms
   H. J. Freund
   *Fritz Haber Inst. of the MPG, Germany*

20:40-21:00  29nC-5  Starting from a Fixed Geometry: Real-Time XPS Investigation of a Surface Reaction with Controlled Molecular Configurations
   *Institut für Angewandte Physik, Justus-Liebig-Univ. Giessen, Germany, Fachbereich Chemie, Philipps-Univ. Marburg, Germany, Synchrotron SOLEIL, France*

Online Room D

29nD  Advanced surface engineering and characterization

Chair: Y. Kubota (RIKEN)

19:00-19:40  29nD-1 (I)  Atomically resolved single-molecule triplet quenching
   *Univ. of Regensburg, Germany, Weizmann Inst. of Science, Israel, IBM Research–Zurich, Switzerland*

19:40-20:00  29nD-2  Self-restoring single-molecule junction by a DNA zipper.
   T. Harashima, T. Terakawa, N. Kurita and T. Nishino
   *Tokyo Inst. of Technology, Japan, Kyoto Univ., Japan, Toyohashi Univ. of Technology, Japan*

20:00-20:20  29nD-3  100 ps time resolution realized with optical-pump bias-voltage-probe scanning tunneling microscopy
   *Univ. of Tsukuba, Japan*

20:20-21:00  29nD-4 (I)  Ultrafast optical generation and control of magnetic skyrmions
   S. Eisebitt
   *Max Born Inst., Germany*
Nov.30 (Tue)

30aA  Plenary Session
Chair: I. Matsuda (The Univ. of Tokyo)
8:40-9:40  30aA-PL  Emergent van der Waals heterostructures of transition metal dichalcogenides
Y. Iwasa1,2
1The Univ. of Tokyo, Japan, 2RIKEN Center for Emergent Matter Science, Japan

Online Room A

30aA  Breakthroughs in 2D materials
Chair: Y. Takamura (Japan Advanced Inst. of Science and Technology)
9:40-10:00  30aA-1  Gate-Controlled Chemical Reactions at Graphene Surfaces
R. Nouchi1,2, M. Matsumoto1, K. Ikeda1 and N. Mitoma1,3
1Osaka Prefecture Univ., Japan, 2PRESTO, Japan Science and Technology Agency, Japan
3Center for Emergent Matter Science, RIKEN, Japan
10:00-10:40  30aA-2 (I)  Spectro-Microscopy of Twisted Bilayer Graphene Structures
J. T. Sadowski
Center for Functional Nanomaterials, Brookhaven National Laboratory, USA

30aA  Breakthroughs in 2D materials
Chair: D. Fujita (National Inst. for Materials Science)
11:00-11:20  30aA-3  Creation of Beyond 6G devices using high-quality epitaxial graphene on affordable device-type wafers
H. Fukidome
Tohoku University, Japan
11:20-11:40  30aA-4  First principles Study on Absorbance of Triple Layer Graphene in a Far-infrared or Tera-Hz Frequency Region
T. Hamada, T. Ohno and J. Nara
National Inst. for Materials Science, Japan
11:40-12:00  30aA-5  PEEM study of the growth process of h-BN and graphene on Ni foil for fabrication of graphene/h-BN heterostructures
R. Yusa1, T. Shimizu1, S. Ogawa1,2 and T. Abukawa1,2
1IMRAM, Tohoku Univ., Japan, 2SRIS, Tohoku Univ., Japan

30pA  Breakthroughs in 2D materials
Chair: T. Uchihashi (National Inst. for Materials Science)
13:00-13:20  30pA-1  Theoretical Study on Role of Edge Termination in CVD Growth of hBN/Graphene Heterostructure on Cu Surface
H. Kageshima1, S. Wang2 and H. Hibino3
1Shimane Univ., Japan, 2NTT Basic Research Labs., Japan, 3Kwansei Univ., Japan
Y. Fukaya1, C.-C. Lee1,2, A. Fleurence4, Y. Hasegawa2, T. Ozaki2 and Y. Y.-Takamura4
1Japan Atomic Energy Agency, Japan, 2The Univ. of Tokyo, Japan, 4Tamkang Univ., Taiwan,
4Japan Advanced Inst. of Science and Technology (JAIST), Japan
13:40-14:20  30pA-3 (I)  Manipulation of Quantum Well States in Two-dimensional Semiconductors
K. Wu, L. Chen and B. Feng
Inst. of Physics, Chinese Academy of Sciences, China
14:20-15:00  30pA-4 (I) The observation of in-plane quantum Griffiths singularity in two-dimensional crystalline superconductors

J. Wang  
*Peking Univ., China*

### 30pA Breakthroughs in 2D materials

Chair: S. Ichinokura (Tokyo Inst. of Technology)

15:20-15:40  30pA-5 STM-IETS study of FePc molecule in 2D Molecular Lattice at 77K

P. Amrit1, N. Kawakami1, Y. -Y. Lai1, E. Minamitani1, R. Arafune1, N. Takagi1 and C. -L. Lin1

1National Yang Ming Chiao Tung Univ., Taiwan, 2Inst. for Molecular Science, Japan, 3International Center for Materials Nanoarchitectonics (MANA), National Inst. for Materials Science (NIMS), Japan, 4Kyoto Univ., Japan

15:40-16:00  30pA-6 Nonlinear mechanical response of rippled MoS2 nanosheet

L. Xie and Y. Oshima

Japan Advanced Inst. of Science and Technology, Japan

16:00-16:20  30pA-7 Crystalline boron monosulfide nanosheets with tunable bandgaps

H. Kusaka1, R. Ishibiki1, M. Toyoda1, T. Fujita1, T. Tokunaga1, A. Yamamoto2,5, M. Miyakawa4, K. Matsushima4, K. Miyazaki2, L. Li1, S. S. Laxman1, T. Sakurai1, E.Nishibori1, T. Masuda1, K. Horiba3, K. Watanabe5, S.Saito1, M. Miyauuchi2, T. Taniguchi2, H. Hosono4, K. Miyazaki2, T. Taniguchi6

1Univ. of Tsukuba, Japan, 2Tokyo Inst. of Technology, Japan, 3Kochi Univ. of Technology, Japan, 4Nagoya Univ., Japan, 5Tokyo Univ. of Agriculture & Technology, Japan, 6National Inst. for Materials Science, Japan, 7High Energy Accelerator Research Organization (KEK), Japan

16:20-16:40  30pA-8 Revealing Local Exciton Dynamics on a Monolayer WS2 probed by Time-resolved Multiprobe STM

H. Mogi1, R. Mizuno1, N. Wada2, Y. Miyata2, Y. Arashida1, A. Taninaka1, S. Yoshida1, O. Takeuchi1 and H. Shigekawa1

1Univ. of Tsukuba, Japan, 2Tokyo Metropolitan Univ., Japan

### 30pA Breakthroughs in 2D materials

Chair: J. Wang (Peking Univ.)

17:00-17:20  30pA-9 Atomic-layer Rashba-type superconductor protected by dynamic spin-momentum locking

S. Yoshizawa1, T. Kobayashi2, Y. Nakata1, K. Yaji4, K. Yokota1, F. Komori1, S. Shin1, K. Sakamoto1 and T. Uchihashi1,6

1National Inst. for Materials Science, Japan, 2Department of Material and Life Science, Osaka Univ., Japan, 3Chiba Univ., Japan, 4The Univ. of Tokyo, Japan, 5Department of Applied Physics, Osaka Univ., Japan, 6Hokkaido Univ., Japan

17:20-18:00  30pA-10 (I) Electronic Properties of Novel Two-dimensional Materials

Y. Zhang

*Fudan Univ., China*

### Online Room B

#### 30aB Vacuum and surface technology of big science

Chair: M. Yamamoto (KEK)

9:40-10:00  30aB-1 Titanium vacuum chamber as repetitively used UHV getter pump

J. Kamiya1, K. Takano1, H. Yuzai and K. Wada2

1Japan Atomic Energy Agency/J-PARC, Japan, 2Tokyo Electronics Co. LTD., Japan
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<td>10:00-10:20</td>
<td>30aB-2</td>
<td>Development of a Flange Mountable TiZrV Non-evaporable Getter Coating Device</td>
<td>Y. Tanimoto\textsuperscript{1,2}, M. Okano, X. Jin, T. Uchiyama, and T. Honda\textsuperscript{2}</td>
</tr>
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<td></td>
<td>\textsuperscript{1}High Energy Accelerator Research Organization (KEK), Japan, \textsuperscript{2}Graduate Univ. for Advanced Studies (SOKENDAI), Japan, \textsuperscript{3}JEOL Ltd., Japan</td>
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<td>\textsuperscript{1}Univ. of Tokyo, Japan, \textsuperscript{2}Inst. of Materials Structure Science, KEK, Japan, \textsuperscript{3}SOKENDAI (The Graduate Univ. for Advanced Studies), Japan, \textsuperscript{4}National Inst. for Materials Science, Japan, \textsuperscript{5}Univ. of Tsukuba, Japan</td>
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### 30aB Vacuum and surface technology of big science

Chair: T. Abukawa (Tohoku Univ.)

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<td>11:00-11:20</td>
<td>30aB-4</td>
<td>A novel measurement approach for near-edge x-ray absorption fine structure: continuous 2π angular rotation of linear polarization</td>
<td>Y. Kudo, Y. Hirata, M. Horio, M. Niibe, and I. Matsuoka</td>
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<td>\textsuperscript{1}Inst. for Solid State Physics, the Univ. of Tokyo, Japan, \textsuperscript{2}National Defense Academy, Japan, \textsuperscript{3}Univ. of Hyogo, Japan, \textsuperscript{4}Trans-scale Quantum Science Inst., Univ. of Tokyo, Japan</td>
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### 30pB Nanotechnology and nanomaterials

Chair: K. Nakajima (Tokyo Inst. of Technology)

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<td>13:00-13:20</td>
<td>30pB-1</td>
<td>Modulation of metal-insulator transition properties of VO\textsubscript{2} in the three-dimensionally controlled nano-micro space</td>
<td>A. N. Hattori, A. I. Osaka, R. Li, X. Q. Shi, F.Z. Guo, K. Hattori, and H. Tanaka</td>
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<td></td>
<td></td>
<td></td>
<td>\textsuperscript{1}SANKEN, Osaka Univ., Japan, \textsuperscript{2}Dalian Jiaotong Univ., China, \textsuperscript{3}Nara Inst. of Science and Technology, Japan</td>
</tr>
<tr>
<td>13:20-13:40</td>
<td>30pB-2</td>
<td>Morphology of nanostructured VO\textsubscript{2} films fabricated by sputtering and annealing process</td>
<td>K. Nishikawa, M. Yoshimura, and Y. Watanabe</td>
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<td>Toyota Technological Inst., Japan</td>
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<td>13:40-14:00</td>
<td>30pB-3</td>
<td>In-situ Formation of Micro- and Nanobubbles by Water Radiolysis in a Scanning Electron Microscope</td>
<td>K. Takahara and S. Suzuki</td>
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<td>Univ. of Hyogo, Japan</td>
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<td>14:00-14:20</td>
<td>30pB-4</td>
<td>Energy dependence of energy-filtered secondary electron images based on image data using HSA detector</td>
<td>K. Ikita, T. Uchida, K. Yokouchi, A. Tanaka, K. Tsutsumi, N. Ikeo, and N. Taguchi</td>
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<td>\textsuperscript{1}JEOL Ltd., Japan, \textsuperscript{2}National Inst. of Advanced Industrial Science and Technology (AIST), Japan</td>
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<td>\textsuperscript{1}Department of Applied Chemistry, Meijo Univ., Japan, \textsuperscript{2}Nanomaterial Research Center, Meijo Univ., Japan, \textsuperscript{3}Department of Materials Science and Engineering, Meijo Univ., Japan</td>
</tr>
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</table>
30pB  Nanotechnology and nanomaterials
Chair: K. Miki (Univ. of Hyogo)
15:20-16:00  30pB-7 (I)  Chiral molecules and the electron spin
Y. Paltiel
The Hebrew Univ., Israel

16:00-16:40  30pB-8 (I)  All-Printed Green Micro-Supercapacitors Based on a Naturalderived Ionic Liquid for Flexible Transient Electronics
L. Migliorini,1 C. Piazzoni,1 K. P.-Esko,2 M. D. Girolamo1, A. Vitaloni1, F. Borghi1,
T. Santaniello1, A. Aabloo2 and P. Milani1
1Università degli Studi di Milano, Italy; 2Univ. of Tartu, Estonia

30pB  Nanotechnology and nanomaterials
Chair: S. Ohno (Yokohama National Univ.)
17:00-17:40  30pB-9 (I)  Ultrafast Dynamics of Lightwave-Driven Currents in Topological Surface States
U. Höfer
Philipps-Univ. of Marburg, Germany

17:40-18:00  30pB-10  Time-, spin- and angle-resolved photoemission spectroscopy of solids in the 10.7-eV extreme-ultraviolet at 1-MHz repetition rate
K. Kawaguchi1, K. Kuroda,1, Y. Fukushima1, Z. Zhao1, S. Tani1, H. Tanaka1, A. Harasawa1,
T. Iimori1, R. Noguchi1, K. Yaji2, S. Shin1, F. Komori1, Y. Kobayashi1 and T. Kondo1
1Inst. for Solid State Physics, The Univ. of Tokyo, Japan, 2Office of Univ. Professor, The Univ. of Tokyo, Japan

Online Room C

30aC  Surface and interface structures / Surface science in hydrogenomics
Chair: T. Abukawa (Tohoku Univ.)
9:40-10:00  30aC-1  Theoretical analysis of resonant Auger electron diffraction patterns in ferromagnets
R. Sagehashi, G. Park and P. Krüger
Chiba Univ., Japan

10:00-10:20  30aC-2  RHEED intensity analysis of H on metal surfaces by enhancing H contribution
T. Kawamura1,2, Y. Fukaya3 and K. Fukutani1,3
1Univ. of Tokyo, Japan, 2Tokyo Denki Univ., Japan, 3Adv. Sci. Res. Center, JAEA, Japan

10:20-10:40  30aC-3  Structural stability of II-V compound ultrathin films
L. G. Arellano1,2, T. Suga1, M. C. -Irisson2 and J. Nakamura1
1The Univ. of Electro-Communications (UEC Tokyo), Japan, 2Instituto Politécnico Nacional, ESIME-Culhuacán, México

30aC  Surface science in hydrogenomics
Chair: A. Itakura (National Inst. for Materials Science)
11:00-11:40  30aC-4 (I)  Adsorption and reaction of formic acid on Cu(111): The importance of the intermolecular interaction
I. Hamada
Osaka Univ., Japan
11:40-12:00  30aC-5  Self-Induction of Radicals in a Self-Assembled Proton-Donor/Acceptor Bilayer on Au(111)  
H. S. Kato¹, A. Ueda², T. Fujino³, Y. Kanematsu⁴, T. Yamada¹, M. Tachikawa³, J. Yoshinobu¹ and H. Mori¹ 
¹Osaka Univ., Japan, ²Kumamoto Univ., Japan, ³ISSP, The Univ. of Tokyo, Japan, ⁴Hiroshima Univ., Japan, ⁵Yokohama City Univ., Japan

30pC  Surface science in hydrogenomics
Chair: K. Fukutani (The Univ. of Tokyo)
13:00-13:40  30pC-1 (I)  Effect of interfacial hydrophilicity/hydrophobicity on the fuel cell reactions  
M. Nakamura  
Chiba Univ., Japan
13:40-14:00  30pC-2  First-Principles Study for Quantum Diffusion of Hydrogen on Various Metal Surfaces  
Y. Kataoka, J. Haruyama, T. Kawatsu and O. Sugino  
Inst. for Solid State Physics, Japan
14:00-14:20  30pC-3  First-Principles Thermodynamics of Hydrogen Defects in LiCoO₂:  
E. F. Arguelles¹, K. Shimizu¹, S. Kasamatsu², A. Nakanishi¹, E. Minamitani¹, Y. Ando¹, S. Kobayashi³, K. Nishio³, R. Shimizu³ and S. Watanabe¹  
¹The Univ. of Tokyo, Japan, ²Yamagata Univ., Japan, ³Inst. of Molecular Science, Japan, ⁴National Inst. of Advanced Industrial Science and Technology, Japan, ⁵Tokyo Inst. of Technology, Japan
14:20-15:00  30pC-4 (I)  Positive Muons in SrTiO₃: Electronic Structure of the Hydrogen-Like Defects and Their Potential Use in Depth-Resolved Detection of Oxygen Vacancies  
T. U. Ito¹,², W. Higemoto¹,²,³, A. Koda²,⁴ and K. Shimomura²,⁴  
¹Advanced Science Research Center, Japan Atomic Energy Agency, Japan, ²Muon Science Section, MLF Division, J-PARC Center, Japan, ³Tokyo Inst. of Technology, Japan, ⁴Inst. of Materials Structure Science, High Energy Accelerator Research Organization, Japan

30pC  Surface science in hydrogenomics
Chair: H. S. Kato (Osaka Univ.)
15:20-15:40  30pC-5  Diffusion Model of Hydrogen Permeating in Stainless Steel  
A. N. Itakura¹, M. Murase², T. Yakabe¹, M. Kitajima¹, N. Miyuchi¹ and S. Aoyagi²  
¹National Inst. for Materials Science, Japan, ²Seikei Univ., Japan
15:40-16:00  30pC-6  Measurement of Spin Polarization of Spin-Polarized Atomic Hydrogen Beam  
H. Nakatsu¹, K. Shimazaki¹, Y. Nagaya¹, H. Ueta², S. Ogura² and K. Fukutani¹,²  
¹The Univ. of Tokyo, Japan, ²Advanced Science Research Center, Japan Atomic Energy Agency (JAEA), Japan, ³Tokyo Denki Univ., Japan
16:00-16:40  30pC-7 (I)  Pump-probe experiments with neutral matter: A new approach to the kinetics of surface reactions  
A. M. Wodtke¹,²,³  
¹Inst. for Physical Chemistry, Georg-August Univ. of Goettingen, Germany, ²Max Planck Inst. for Biophysical Chemistry, Germany, ³International Center for Advanced Studies of Energy Conversion, Georg-August Univ. of Goettingen, Germany
30pC  Surface chemistry
Chair: A. Nakayama (Univ. of Tokyo)
17:00-17:20  30pC-8  Real-time Observation of the Electrochemical Reaction at a Solid-liquid Interface by Fluorescence-yield Wavelength-dispersive Soft X-ray Absorption Spectroscopy
  K. Sakata and K. Amemiya
  High Energy Accelerator Research Organization (KEK), Japan
17:20-18:00  30pC-9 (I) Dynamic Catalysts under Operando Conditions
  B. R. Cuenya
  Fritz-Haber-Inst. of the Max Planck Society, Germany

Online Room D

30aD  Energy and environmental science
Chair: I. Yagi (Hokkaido Univ.)
9:40-10:00  30aD-1  Distribution of water and its chemical states inside the fuel cell electrolyte membranes under transient conditions during power generation analyzed by operando time-resolved CARS spectroscopy
  H. Nishiyama¹, S. W. Wakolo¹, A. Iiyama¹ and J. Inukai¹²
  ¹Univ. of Yamanashi, Japan, ²Univ. Kebangsaan, Malaysia
10:00-10:40  30aD-2 (I) Controlling CO₂ Electrolyzer Reactivity Using Alloy and Polymer-modified Electrodes
  A. A. Gewirth and X. Chen
  Univ. of Illinois, USA

30aD  Energy and environmental science
Chair: J. Inukai (Univ. of Yamanashi)
11:00-11:40  30aD-3 (I) Size- and Composition-Selected Cluster Catalysts and Electrocatalysts
  S. L. Anderson, G. Li, T. Masubuchi, A. Cass, M. Malek and A. Fuchs
  Univ. of Utah, USA
11:40-12:00  30aD-4  Hydrogen Oxidation Reaction Activity for Vacuum-prepared Ru/Ir(111) Bimetallic Alloy Surfaces
  K. Hayashi, K. Kusunoki, T. Tomimori, N. Todoroki and T. Wadayama
  Tohoku Univ., Japan

30pD  Energy and environmental science / Surface and interface structures
Chair: Y. Hasegawa (The Univ. of Tokyo)
13:00-13:20  30pD-1  Growth of two dimensional cuprous fluoride on Cu(100)
  P. Krüger¹, M. N. Petukhov², A. Oreshkin¹ and D. Muzychenco³
  ¹Chiba Univ., Japan, ²ICB, France, ³Lomonosov Moscow State Univ., Russia
  S. E.M. Putra¹, Y. Morikawa¹² and I. Hamada¹²
  ¹Department of Precision Engineering, Graduate School of Engineering, Osaka Univ., Japan, ²Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto Univ., Japan, ³Research Center for Precision Engineering, Graduate School of Engineering, Osaka Univ., Japan
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<td>13:40-14:00</td>
<td>30pD-3</td>
<td>Surface Structure of Ice-I revealed by Atomic Force Microscope</td>
<td>K. Iwata, N. Kawakami, A. Shiotari and Y. Sugimoto</td>
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<td>14:00-14:20</td>
<td>30pD-4</td>
<td>Structure analysis of oxygen layer on Ag(111) by scanning probe microscopy</td>
<td>M. Kimura and Y. Sugimoto</td>
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<td>14:40-15:00</td>
<td>30pD-6</td>
<td>Manipulation of C60 molecules on Ag(111) by non-contact atomic force microscopy</td>
<td>L. Feng, T. Iizuka, Y. Yasui and Y. Sugimoto</td>
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**30pD** Energy and environmental science / Surface and interface structures

Chair: H. Yasumatsu (Toyota Technological Inst.)

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<td>15:20-16:00</td>
<td>30pD-7 (I)</td>
<td>Quasi non-destructive ultra-trace characterization and isotope imaging of natural and anthropogenic nanoparticles by SN MS</td>
<td>C. Walther, H. Bosco, P. Hanemann, L. Holtmann, L. Leiermann, M. Raiwa, M. Weiss and K. Wendt</td>
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<td>16:00-16:20</td>
<td>30pD-8</td>
<td>Semitransparent Ta3N5-nanorods Enabled Unbiased Water Splitting Efficiency of 9.1%</td>
<td>Y. Pihosh, V. Nandal, T. Higashi, K. Seki and K. Domen</td>
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**30pD** Energy and environmental science / Surface and interface structures

Chair: T. Yokoyama (Yokohama City Univ.)

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<tr>
<td>17:00-17:20</td>
<td>30pD-10</td>
<td>STM / UPS study of two-dimensional host-guest molecule array</td>
<td>F. Nishino, R. Nemoto, C.-H. Wang, M. Horie, T. Hosokai, Y. Hasegawa, S. Kera and T. K. Yamada</td>
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<td>17:20-17:40</td>
<td>30pD-11</td>
<td>DFT simulations of the mechanical tuning of thermopower in single molecule junctions</td>
<td>E. Montes, H. Cho, T. Nishino, S. Fuji and H. Vázquez</td>
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30PS  Poster Session

Surface and interface structures
Chair: T. Shirasawa (Inst. of Advanced Industrial Science and Technology)

30PS-1* STM observation of Bi-intercalated graphene on the Cu(111) substrate
T. Kasai1, T. Yamagami1, K. Takatsuji2 and H. Hirayama1
1Department of Physics, Tokyo Inst. of Technology, Japan, 2Department of Materials Science and Engineering, Tokyo Inst. of Technology, Japan

30PS-2* Multi-scale Simulation of Equilibrium Step Fluctuations on Cu(111) Surfaces
H. H. Halim1, S. E. M. Putra1, F. Muttapiem2, I. Hamada1,3, K. Inagaki1,3, Y. Hamamoto1,3 and Y. Morikawa1,3,4
1Department of Precision Engineering, Graduate School of Engineering, Osaka Univ., Japan, 2Faculty of Mathematics and Natural Sciences, Bandung Inst. of Technology, Indonesia, 3Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto Univ., Japan, 4Research Center for Ultra-Precision Science and Technology, Graduate School of Engineering, Osaka Univ., Japan

30PS-3 Simulated STM Images of 2, 4, 6-Tris(4-bromophenyl)-1, 3, 5-triazine on Au(111)
A. Okada1, S. Hara2, S. Hasui1, M. Yoshimura2 and K. Kadono1
1Kyoto Inst. of Technology, Japan, 2National Inst. of Information and Communications Technology, Japan, 3Toyota Technological Inst., Japan

30PS-4 Epitaxial growth and structure determination of borophene on Ag(111)
Y. Tsujikawa1, M. Shoji2, M. Hamada2, T. Takeda2, I. Mochizuki1, F. Komori1, I. Matsuda1 and A. Takayama2
1Univ. of Tokyo, Japan, 2Waseda Univ., Japan, 3Inst. of Material Structure Science, KEK, Japan

30PS-5 STM observation of CuPc on Au(110)-(1x2) : from isolated monomer to periodic chains
H. Koshida, H. Okuyama, S. Hatta and T. Aruga
Kyoto Univ., Japan

30PS-6* One-dimensional chain of water molecules on Pt(533) surfaces studied by heterodyne-detected vibrational sum-frequency generation spectroscopy
N. Nagatsuka, T. Muratani, N. Shibata and K. Watanabe
Kyoto Univ., Japan

30PS-7 Nucleation of ultrathin Bi(110) film on the Si(111)-(3\times 3\times 3)-B substrate in the two step growth
M. Shimura1, R. Ushioda1, K. Nakatsuji2 and H. Hirayama1
1Department of Physics, Tokyo Inst. of Technology, Japan, 2Department of Materials Science and Engineering, Tokyo Inst. of Technology, Japan

30PS-8* Structure of Bi(111) terraces nucleated on the Bi(110) island
N. Sasagawa1, R. Ushioda1, K. Nakatsuji2 and H. Hirayama1
1Department of Physics, Tokyo Inst. of Technology, Japan, 2Department of Materials Science and Engineering, Tokyo Inst. of Technology, Japan

30PS-9 Self-Assembly of HB-HBC molecules on the Si(111)-Ag surface
T. Yokoyama, J. Motojima, N. Suzuki and H. Tsukada
Yokohama City Univ., Japan

30PS-10* Interlayer distances of graphene structure on SiC studied by TRHEPD
T. Takeda1, M. Hamada1, Y. Tsujikawa1, I. Mochizuki2, T. Hoshi2,3, T. Hyodo2 and A. Takayama1
1Waseda Univ., Japan, 2Inst. of Materials Structure Science, KEK, Japan, 3Tottori Univ., Japan

30PS-11* Observation of metal-free phthalocyanine adsorbed on SiC reconstructed surface
S. Emoto1, A. Isobe1, K. Kawanuma2, S. Kuroki2, M. Naitoh3 and T. Ikari1
1National Inst. of Technology (KOSEN), Ube College, Japan, 2Hiroshima Univ., Japan, 3Kyushu Inst. of Technology, Japan
30PS-12* Surface Decomposition of Pt pre-adsorbed SiC surface studied by metastable atom induced electron spectroscopy
S. Masuda1, T. Watanabe2, F. Yamanaka1, Y. Yamada1, M. Watanabe1, M. Naitoh3 and T. Ikari1
1National Inst. of Technology (KOSEN), Ube College, Japan, 2Graduate School of Life Science and Systems Engineering Kyushu Inst. of Technology, Japan, 3Department of Electrical Engineering and Electronics, Kyushu Inst. of Technology, Japan

30PS-13 Bias effect on surface chemical states of CH3NH3PbBr3 hybrid perovskite single crystal
1Yonsei Univ., Republic of Korea, 2POSTECH, Republic of Korea, 3The Univ. of Queensland, Australia, 4Nara Inst. of Science and Technology, Japan, 5Univ. of Tsukuba, Japan

30PS-14* Gap inhomogeneity in High-Tc cuprate superconductor studied by high resolution micro-ARPES
T. Sugiyama1, H. Iwasawa2,3, S. Ozawa1, H. Oda1, T. Kono1, T. Okuda1, K. Miyamoto1, S. Ishida4, Y. Yoshida4, H. Eisaki4 and A. Kimura1
1Hiroshima Univ., Japan, 2National Insts for Quantum and Radiological Science and Technology, Japan, 3Hiroshima Synchrotron Radiation Center, Hiroshima Univ. Japan, 4National Inst. of Advanced Industrial Science and Technology, Japan

30PS-15* Surface morphologies and band alignments of NiO layers grown on β-Ga2O3 surfaces
Y. Seki, A. Okada, Y. Kajita, H. Nishinaka and K. Kadono
Kyoto Inst. of Technology, Japan

30PS-16* Non-Contact Atomic Force Microscopy Observation of Charge Ordering on Reconstructed FeOx (001) Surface
S. Ishikawa1, A. Subagyo1, H. Hosoi2 and K. Sueoka1
1Graduate School of Information Science and Technology, Japan, 2Creative Research Institution Sosei, Japan

30PS-17 Nanoscale spatial distribution of strain in VO2 structural phase transition
Y. Ashida1, T. Ishibe1, J. Yang2, N. Naruse3 and Y. Nakamura1
1Osaka Univ., Japan, 2The Inst. of Scientific and Industrial Research, Osaka Univ., Japan, 3Shiga Univ. of Medical Science, Japan

30PS-18 Structural analysis of VO2 thin films prepared on r-plane sapphire substrates by mist CVD
H. Maeda1, E. Nakayama1, O. Kubo1, Y. Matamura2, M. Kimura1, T. Ikenoue1, H. Tabata1 and M. Katayama1
1Osaka Univ., Japan, 2Kyoto Univ., Japan

30PS-19 Realization of Verwey Transition in 50 nm Fe3O4 Ultrathin Film Grown on Atomically Smooth Substrate
A. I. Osaka1, D. Toh1, K. Yamauchi2, K. Hattori1, X. Q. Shi1, F. Z. Guo4, H. Tanaka1 and A. N. Hattori1
1SANKEN, Osaka Univ., Japan, 2Graduate School of Engineering, Osaka Univ., Japan, 3Graduate School of Science and Technology, Nara Inst. of Science and Technology, Japan, 4Dalian Jiaotong Univ., China

30PS-20* Theoretical investigation of carrier doping of topological insulator Be2Se3 by surface adsorption
C. Fan1, K. Sakamoto2 and P. Krüger1
1Chiba Univ., Japan, 2Osaka Univ., Japan

30PS-21 Oxygen Reduction Reaction Activity and Electrochemical Structural Stability of Nb-modified Pt/Co/Pt(111) Surfaces
H. Kasumi, T. Takano, D. Kudo, N. Todoroki and T. Wadayama
Tohoku Univ., Japan

30PS-22 Microstructures and Oxygen Reduction Reaction Properties of Pt/Nb-doped-SnO2/Pt(111) Surfaces
Y. Chida, J. Adachi, N. Todoroki and T. Wadayama
Tohoku Univ., Japan

30PS-23 Stacking effect on Oxygen Reduction Reaction of Nitrogen-doped Graphene
T. Takashima and J. Nakamura
The Univ. of Electro-Communications (UEC Tokyo), Japan
30PS-24  Fabrication of Ferroelectric PVDF Films on Monolayer Graphene
R. Matsumoto, P. Viswanath, M. Hara and M. Yoshimura
Toyota Technological Inst., Japan

30PS-25*  Boiling behaviour from surface by microwave local heating of different power
R. Yakata¹, S. Sonobe¹, Y. Asakuma¹, A. Hyde² and C. Phan²
¹Univ. of Hyogo, Japan, ²Curtin Univ., Australia

30PS-26*  New approach for maintenance of interfacial modification by two-stage microwave irradiation
Y. Watanabe¹, K. Saiuchi¹, S. Sonobe¹, Y. Asakuma¹, A. Hyde² and C. Phan²
¹Univ. of Hyogo, Japan, ²Curtin Univ., Australia

30PS-27  Surface tension for emulsion of oil-in-water during and after microwave irradiation
Y. Watanabe¹, S. Ueda¹, A. Shibatani¹, Y. Asakuma¹ and C. Phan²
¹Univ. of Hyogo, Japan, ²Curtin Univ., Australia

Nanotechnology and nanomaterials
Chair: K. Ozawa (Tokyo Inst. of Technology)

30PS-28  Theoretical study on thermoelectric power of Pd-adsorbed carbon nanotubes
M. Miyabe, N. Araki and T. Yamamoto
Tokyo Univ. of Science, Japan

30PS-29  Influence of Surface Roughness on Phonon-Drag Phenomenon in Thin Si Layers
A. Yamaguchi¹, R. Kasagi², Y. Kato¹, K. Fauzia³, Y. Ono¹, A. Ogino¹ and H. Ikeda¹
¹Shizuoka Univ., Japan, ²Agency for the Assessment and Application of Technology, Japan

30PS-30  Fabrication of a Nitrogen-Vacancy (NV) hosted diamond pillars for scanning magnetometry probes
A. Ideguchi, Y. Kainuma, K. Hayashi and T. An
Japan Advanced Inst. of Science and Technology (JAIST), Japan

30PS-31  Fine control of colloidal catalyst nanoparticles for ultra-high-density carbon nanotube forest
K. Tabata¹, Y. Kono¹, T. Nakano¹ and Y. Inoue
Shizuoka Univ., Japan

30PS-32  Development of thermoelectric circuit simulation method for carbon nanotube film
J. Kobayashi and T. Yamamoto
Tokyo Univ. of Science, Japan

30PS-33  Ion Irradiation Induced Synthesis of Novel Amorphous Double-Thick-Walled Silicon Carbide Nanotubes
T. Taguchi¹, S. Yamamoto² and H. Ohba¹
¹National Institutes for Quantum and Radiological Science and Technology, Japan, ²National Institutes for Quantum and Radiological Science and Technology, Japan

30PS-34  In situ transmission electron microscopy of carbon nanotubes and molybdenum during laser heating
T. Egoshi, N. Uemura and T. Kizuku
Univ. of Tsukuba, Japan

30PS-35  New boride materials consisting of H, Ca, and B
H. Yoshioka¹, S. Tominaka², B. Slater³, H. Hosono⁴ and T. Kondo⁵
¹Graduate school of Univ. of Tsukuba, Japan, ²International Center for Materials Nanoarchitectonics, NIMS, Japan, ³Univ. College London, UK, ⁴MCES, Tokyo Inst. of Technology, Japan, ⁵Faculty of Pure and Applied Sciences, Univ. of Tsukuba, Japan

30PS-36  High-resolution imaging of small peptides on HOPG using scanning tunneling microscopy
K. Fujii¹, Y. Shinohara¹, A. Matsui, N. Naruse and Y. Mera
Shiga Univ. of Medical Science, Japan
30PS-37 Intracellular Cargo Delivery with Au nanotube Membrane
K. Oyama1, B. Zhang1, Z. Chen1, D. Zhuang1, D. Pan1, H. Ma1 and T. Miyake1,2
1Waseda Univ. IPS, Japan, 2JST-PRESTO, Japan

30PS-38 Structural changes in graphite oxide during thermal annealing in air and in vacuum
K. K. H. De Silva, K. Nishikawa, T. Shimizu and M. Yoshimura
Toyota Technological Inst., Japan

30PS-39 Self-folded Multilayer Graphene
T. Goto, T. F. Teshima, K. Sakai and M. Yamaguchi
NTT Basic Research Laboratories and Bio-Medical Informatics Research Center, NTT Corporations, Japan

30PS-40 Direct growth of patterned Ge on insulators using graphene
T. Tsukamoto1, N. Hirose2, A. Kasamatsu3, T. Matsui4 and Y. Suda1
1The Univ. of Electro-Communications, Japan, 2National Inst. of Information and Communications Technology, Japan, 3Tokyo Univ. of Agriculture and Technology, Japan

30PS-41 Transient photocapacitance measurement for characterization of deep level defects in borondoped (001) and (111) diamond films
O. Maida, T. Kodama, D. Kanemoto and T. Hirose
Osaka Univ., Japan

30PS-42 Antiaromaticity as p-doping: electronic and conducting properties of antiaromatic single molecule junctions
N. P. Arasu and H. Vázquez
Inst. of Physics, Czech Academy of Sciences, Czech Republic

30PS-43 Mechanically Tuned Thermopower of Single-Molecule Junctions
S. Fujii1, E. Montes2, H. Cho1, Y. Yue1, M. Koike1, M. Kiguchi1, H. Vázquez2 and T. Nishino1
1Tokyo Tech., Japan, 2Inst. of Physics, Czech Academy of Sciences, Czech Republic

30PS-44 The surface tension of nanodroplets: molecular dynamics calculations
G. V. Kharlamov1,2
1Siberian State Univ. of Telecommunications and Information Sciences, Russia, 2Siberian Transport Univ., Russia

30PS-45 Adsorption site identification in single molecule junctions
E. Montes and H. Vázquez
Inst. of Physics, Czech Academy of Sciences, Czech Republic

30PS-46* Electronic Structure of a Single-Molecule Junction during the Junction-Breaking Process
Y. Isshiki1, E. Montes2, N. P. Arasu2, T. Nishino1, H. Vázquez2 and S. Fujii1
1Tokyo Inst. of Technology, Japan, 2Inst. of Physics, Czech Academy of Sciences, Czech Republic

30PS-47 Development of an UHV-LT scanning magnetic imaging microscope using diamond NV-center probe
K. Hayashi, A. Ideguchi, K. Nakashita, Y. Kainuma, T. An
Japan Advanced Inst. of Science and Technology, Japan

Surface chemistry / Surface science in hydrogenomics
Chair: Y. Nakayama (Tokyo Univ. Sci.), I. Hamada (Osaka Univ.)

30PS-48* A mechanism study on the incorporation of sub-nanometer vacancy defects in graphene lattice by scanning tunneling microscopy
S. Li1, S. Huang1, T. V. Mohammad1,2, N. Marzari2 and K. V. Agrawal1
1Laboratory of Advanced Separations, École Polytechnique Fédérale de Lausanne (EPFL), Switzerland, 2Theory and Simulation of Materials, National Centre for Computational Design and Discovery of Novel Materials (MARVEL), EPFL, Switzerland
30PS-49* Electronic state changes of Cu nanoparticles on rutile TiO$_2$(110) by O$_2$ and CO exposure
K. Mitsuhashi$^1$, K. Ide$^2$, H. Takatani$^2$ and M. Takizawa$^2$
$^1$Ritsumeikan Global Innovation Research Organization, Ritsumeikan Univ., Japan, $^2$Department of Physical Sciences, Faculty of Science and Engineering, Ritsumeikan Univ., Japan

30PS-50* Photocatalytic Activity and the Valence Band Structure of Edge and Terrace Sites of Natural Anatase TiO$_2$: Crystal
K. Hiromori$^{1,2}$, Y. Aiura$^2$, K. Mase$^{3,4}$, N. Nakajima$^1$ and K. Ozawa$^{1,5}$
$^1$Hiroshima Univ., Japan, $^2$Research Inst. for Advanced Electronics and Photonics, National Inst. of Advanced Industrial Science and Technology (AIST), Japan, $^3$Inst. of Materials Structure Science, High Energy Accelerator Research Organization (KEK), Japan, $^4$SOKENDAI (The Graduate Univ. for Advanced Studies), Japan, $^5$Tokyo Inst. of Technology, Japan

30PS-51* X-ray photoelectron spectroscopy study of anatase TiO$_2$(001) using oxygen supersonic seeded molecular beam
$^1$Nagoya Univ. of Technology, Japan, $^2$Yokohama National Univ., Japan, $^3$Osaka Univ., Japan, $^4$Materials Sciences Research Center, Japan Atomic Energy Agency, Japan, $^5$Kochi Univ. of Technology, Japan

30PS-52* First principles Investigation of electronic structure of Pd clusters on ZrO$_2$
K. Nakada and T. Homma
Japan Synchrotron Radiation Research Inst., Japan

30PS-53* Molecular beams study on satellite peak observed in O1s photoelectron spectra for Si(001)$\times 2$ surface oxidation at room temperature
A. Yoshigoe$^1$, Y. Tsuda$^1$, A. Tomino$^1$, T. Sakamoto$^1$, S. Ogawa$^2$ and Y. Takakuwa$^3$
$^1$IAEA Materials Sciences Research Center, Japan, $^2$Tohoku Univ. SRIS, Japan, $^3$Tohoku Univ. µSIC, Japan

30PS-54* High-order overtone-mediated dissociation mechanism of a single O$_2$ molecule chemisorbed on Ag(110)
M. Lee$^{1,2}$, E. Kazuma$^1$, C. Zhang$^1$, M. Trenal$^3$, J. Takeya$^3$, J. Jung$^4$ and Y. Kim$^1$
$^1$Surface and Interface Science Laboratory, RIKEN, $^2$The Univ. of Tokyo, Japan, $^3$Univ. of Illinois at Chicago, USA, $^4$Univ. of Ulsan, Republic of Korea

30PS-55* A flat-lying dimer as a key intermediate in NO reduction on Cu(100)
K. Kuroishii$^1$, M. R. A. Fauzan$^1$, T. N. Pham$^2$, Y. Wang$^2$, Y. Hamamoto$^2$, K. Inagaki$^2$, A. Shiotari, H. Okuyama$^1$, S. Hatta$^1$, T. Aruga$^1$ and Y. Morikawa$^1$
$^1$Kyoto Univ., Japan, $^2$Osaka Univ., Japan, $^3$Fritz-Haber Inst. of the Max-Planck Society, Germany

30PS-56* First-principles analysis of stearic acid adsorption on calcite (104) surface
N. Machida$^1$, M. Misawa$^1$, Y. Keszuk$^2$ and K. Tsuruta$^1$
$^1$Okayama Univ., Japan, $^2$Shiraishi Central Laboratories Co., Ltd., Japan

30PS-57* Photochemical Processes in H$_2^{18}$O-CO Ice Films: Pathways for CO$_2$ Formation
A. Hirayama$^{1,2}$, K. Taniguchi$^2$, I. Arakawa$^1$ and K. Yamakawa$^2$
$^1$Gakushuin Univ., Japan, $^2$National Astronomical Observatory, Japan, $^3$Japan Atomic Energy Agency, Japan

30PS-58* Characterization and Control of Aluminum Oxide Thin Films Formed on Surfaces of FeCo-V Alloys
K. Urakawa$^1$, M. Kasuya$^2$, T. Sato$^2$, T. Ebata$^1$ and S. Suzuki$^2$
$^1$Tohoku Steel Co., Ltd., Japan, $^2$Tohoku Univ., Japan

30PS-59* Mechanism of oxygen evolution reaction on nickel oxyhydroxides in alkaline solutions
R. P. Putra$^1$, I. B. Rachman$^1$, H. Horino$^2$ and J. I. Rzeznicka$^1$
$^1$Shibaura Inst. of Technology, Japan, $^2$Tohoku Univ., Japan

30PS-60* Composite of MgH$_2$: Nanoparticles and Hydrogen Boride Sheets
K. Goto$^1$, S. Ito$^{1,2}$, H. Hosono$^{2,3}$, S. Orimo$^1$ and T. Kondo$^{1,2}$
$^1$Univ. of Tsukuba, Japan, $^2$MCES, Tokyo Inst. of Technology, Japan, $^3$MANA, NIMS, Japan, $^4$WPI-AIMR, Tohoku Univ., Japan
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<td>30PS-62*</td>
<td>Study on Self-Assembly for Functional Heterogeneous Bilayers on Au(111)</td>
<td>R. Muneyasu, T. Yamada and H. S. Kato</td>
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<td>30PS-66*</td>
<td>Growth mode and electronic state analyses of Cu nanoparticles on HOPG surfaces</td>
<td>H. Takatani, K. Mitsuhara, Y. Hasegawa and M. Takizawa</td>
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<td>30PS-67</td>
<td>STM measurements on chiral molecules adsorbed on Cu(111)</td>
<td>M. Haze, K. Taga, D. Miyajima and Y. Hasegawa</td>
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<td>1Univ. of Tokyo, Japan, 2RIKEN, Center for Emergent Matter Science (CEMS), Japan</td>
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<td>30PS-68*</td>
<td>Surface electron dynamics on clean and chemisorbed Pt(111) surfaces studied by terahertz-field-induced second harmonic light</td>
<td>S. Tanaka, T. Fujimoto, Y. Murotani, T. Matsuda, N. Kanda, R. Matsunaga and J. Yoshinobu</td>
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<td>30PS-69</td>
<td>Influence of sulfur on graphene growth on Ni(110) studied with LEEM/LEED</td>
<td>M. Suzuki, Y. Yamauchi, D. Fujita, T. Yasue, T. Koshikawa and E. Bauer</td>
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<td>1National Inst. for Materials Science, Japan, 2Osaka Electro-Communication Univ., Japan, 3Arizona State Univ., USA</td>
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<td>Univ. of Tsukuba, Japan</td>
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<td>30PS-71*</td>
<td>Light induced atomic desorption of Rb from FeO2 surface</td>
<td>K. Asakawa, Y. Tani, T. Kawauchi, K. Fukutani and A. Hatakeyama</td>
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<td>1The Inst. for Solid State Physics, The Univ. of Tokyo, Japan, 2Trans-scale Quantum Science Inst., The Univ. of Tokyo, Japan</td>
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30PS-73  Metal-insulator-metal strips for infrared absorbers based on Nickel Aluminum superalloy
T. P. Tran\textsuperscript{1,2}, T. D. Ngo\textsuperscript{1,2} and T. Nagao\textsuperscript{1,2}
\textsuperscript{1}International Center for Materials Nanoarchitectonics, National Inst. for Materials Science, Japan, \textsuperscript{2}Hokkaido Univ., Japan

30PS-74*  First-principles study of anomalous Nernst Effect in Cr-doped Bi\textsubscript{2}Se\textsubscript{3}
V. Saraswati\textsuperscript{1}, R. Syariati\textsuperscript{2}, H. Sawahata\textsuperscript{2}, N. Yamaguchi\textsuperscript{2} and F. Ishii\textsuperscript{2}
\textsuperscript{1}Graduate School of Natural Science and Technology, Kanazawa Univ., Japan, \textsuperscript{2}Nanomaterials Research Inst., Kanazawa Univ., Japan

30PS-75*  Short-range ferromagnetic interaction in a monolayer VSe\textsubscript{2} film revealed by element-specific x-ray magnetic circular dichroism
K. Sumida\textsuperscript{1}, Y. Takeda\textsuperscript{1}, S. Kusaka\textsuperscript{2}, K. Kobayashi\textsuperscript{3} and T. Hirahara\textsuperscript{2}
\textsuperscript{1}Materials Sciences Research Center, Japan Atomic Energy Agency, Japan, \textsuperscript{2}Tokyo Inst. of Technology, Japan, \textsuperscript{3}Ochanomizu Univ., Japan

30PS-76  Spatially-modulated superconductivity due to the interplay between electronic nematicity and surface structure in FeSe\textsubscript{1−x}Te\textsubscript{x} at the nematic quantum critical point
Y. Yoshida\textsuperscript{1,2}, H. H. Yang\textsuperscript{2,3}, K. Terao\textsuperscript{4}, T. Kashiwagi\textsuperscript{2}, K. Kadowaki\textsuperscript{4} and Y. Hasegawa\textsuperscript{2}
\textsuperscript{1}Kanazawa Univ., Japan, \textsuperscript{2}Univ. of Tokyo, Japan, \textsuperscript{3}Physikalisches Institut, Karlsruhe Inst. of Technology, Germany, \textsuperscript{4}Univ. of Tsukuba, Japan

30PS-77*  Fluctuated Spin Texture of Rashba-Split Surface Bands of Low Symmetric Surface Bi/InAs(110)-(2×1)
T. Nakamura\textsuperscript{1,2}, Y. Ohtsubo\textsuperscript{1,2,3}, K. Yaji\textsuperscript{4}, A. Harasawa\textsuperscript{4}, S. Shin\textsuperscript{4}, F. Komori\textsuperscript{4} and S. Kimura\textsuperscript{1,2,5}
\textsuperscript{1}Graduate School of Frontier Biosciences, Osaka Univ., Japan, \textsuperscript{2}Department of Physics, Osaka Univ., Japan, \textsuperscript{3}Inst. for Advances Synchrotron Light Source, National Institutes for Quantum and Radiological Science and Technology, Japan, \textsuperscript{4}The Univ. of Tokyo, Japan, \textsuperscript{5}Inst. for Molecular Science, Japan

30PS-78*  Topological Electronic Structure of the Interface between α-Sn and InSb
T. Nakaya\textsuperscript{1}, Y. Ohtsubo\textsuperscript{1,2,3}, T. Nakamura\textsuperscript{1,2} and S. Kimura\textsuperscript{1,2,4}
\textsuperscript{1}Department of Physics, Osaka Univ., Japan, \textsuperscript{2}Graduate School of Frontier Biosciences Osaka Univ., Japan, \textsuperscript{3}Inst. for Advances Synchrotron Light Source, National Institutes for Quantum and Radiological Science and Technology, Japan, \textsuperscript{4}Inst. for Molecular Science, Japan

30PS-79  Electrical contact properties of graphene oxide thin film fabricated by electrophoretic deposition on copper substrate
N. Ye\textsuperscript{1}, K. Hatakeyama\textsuperscript{1}, T. Shimizu\textsuperscript{3} and T. Kubo\textsuperscript{3}
\textsuperscript{1}Research and Technology Centre, YAZAKI Corporation, Japan, \textsuperscript{2}Kumamoto Univ., Japan, \textsuperscript{3}National Inst. of Advanced Industrial Science and Technology (AIST), Japan

30PS-80  Work Function of Graphene Sheets Fabricated by Chemical Vapor Deposition in Ultra High Vacuum
S. Tanaka\textsuperscript{1}, Y. Tominari\textsuperscript{1} and H. Suzuki\textsuperscript{2}
\textsuperscript{1}Advanced ICT Research Inst., National Inst. of Information and Communications Technology, Japan, \textsuperscript{2}Hiroshima Univ., Japan

30PS-81*  Tuning the transition temperature of atomic-layer superconductor Si(111)-(√7 × √3)-In by organic molecular deposition
K. Yokota\textsuperscript{1,2}, T. Kobayashi\textsuperscript{3}, W. Qian\textsuperscript{1}, S. Inagaki\textsuperscript{3}, K. Sakamoto\textsuperscript{3} and T. Uchihashi\textsuperscript{1,2}
\textsuperscript{1}Hokkaido Univ., Japan, \textsuperscript{2}National Inst. for Materials Science, Japan, \textsuperscript{3}Osaka Univ., Japan

30PS-82  Orientation-Controlled Thin Film Anodized Aluminum Oxide from Thin Smooth Al Layer on <111>-Au/Si Substrate
P. L. Khoo, T. Nakamura and M. Izaki
Toyohashi Univ. of Technology, Japan

30PS-83*  Edge dependence of electrical conductance of graphene nanoribbon
C. Liu\textsuperscript{1}, J. Zhang\textsuperscript{1}, X. Zhang\textsuperscript{2}, M. Manoharan\textsuperscript{1}, H. Mizuta\textsuperscript{1,3} and Y. Oshima\textsuperscript{1}
\textsuperscript{1}Japan Advanced Inst. of Science and Technology, Japan, \textsuperscript{2}Shibaura Inst. of Technology, Japan, \textsuperscript{3}Hitachi Cambridge Laboratory Univ., UK
30PS-84* Two-step synthesis method of exfoliated MoS2 nanosheets with advanced properties for catalytic HER

L. Li1, S. S. Laxman2 and T. Kondo2,3,4
1Graduate school of Univ. of Tsukuba, Japan, 2Department of Materials Science, Faculty of Pure and Applied Sciences, Univ. of Tsukuba, Japan, 3MCES, Tokyo Inst. of Technology, Japan, 4Tsukuba Research Center for Energy Materials Science, Faculty of Pure and Applied Sciences, Univ. of Tsukuba, Japan

30PS-85* Graphene Growth on Carbon Steel by Chemical Vapor Deposition

K. Hiratochi1,2, H. Suga1,2, T. Shimizu2, M. Okada2, K. Bando1, T. Yamada3 and T. Kubo2
1Chiba Tech, Japan, 2AIST, Japan

30PS-86* In-situ X-ray diffraction analysis of GaN growth on epitaxial graphene with AlN buffer layer

S. Fuke1, T. Sasaki2, Y. Kawai1 and H. Hibino1
1Kwansei Gakuin Univ., Japan, 2National Institutes for Quantum and Radiological Science and Technology, Japan

30PS-87 Graphene growth using patterned copper thin films on quartz substrates

Y. Tominari1, H. Suzuki2 and S. Tanaka1
1Advanced ICT Research Inst., National Inst. of Information and Communications Technology, Japan, 2Hiroshima Univ., Japan

30PS-88* Raman spectroscopic studies of laser-induced structural change of epitaxial graphene layers on SiC(0001)

R. Horie1, T. Yamana1, J. Kanasaki1, K. Kisoda2, C. Itoh3 and K. Takahashi4
1Osaka City Univ., Japan, 2Graduate School of Education, Wakayama Univ., Japan, 3Graduate School of Systems Engineering, Wakayama Univ., Japan, 4Synchrotron Light Application Center, Saga Univ., Japan

30PS-89* Controlling synthesis of h-BN films on c-plane and r-plane sapphire substrates

Y. Harada1, Y. Kawai1, R. Yagi1 and H. Hibino
Kwansei Gakuin Univ., Japan

Biomaterial interfaces

Chair: R. Tero (Toyohashi Univ. Tech.)

30PS-90 Development of Plasmonic Surface with Periodic Nano-Bowls for Optical Condensation of Nanoparticles

M. Kanoda1,2,3, K. Hayashi1,2,3, M. Tamura2,4, S. Tokonami2 and T. Iida1,2
1Graduate School of Science, Osaka Prefecture Univ., Japan, 2Research Inst. for Light-induced Acceleration System (RILACS), Osaka Prefecture Univ., Japan, 3Graduate School of Engineering, Osaka Prefecture Univ., Japan, 4Osaka Univ., Japan

30PS-91 Rapid and sensitive detection of proteins at solid-liquid interface under light-induced assembly of photoresponsive particles in microchannel

T. Iida1,2, M. Ueda1,2,3, S. Hamatani1,2,3, Y. Takagi1,2, M. Tamura2,4 and S. Tokonami2,3
1Graduate School of Science, Osaka Prefecture Univ., Japan, 2Research Inst. for Light-induced Acceleration System (RILACS), Osaka Prefecture Univ., Japan, 3Graduate School of Engineering, Osaka Prefecture Univ., Japan, 4Osaka Univ., Japan

30PS-92 Raman spectromicroscopy of stratum corneum damaged by continuous-wave laser

T. Honda1, Y. Kawai1 and S. Yanagiya1,2
1Graduate School of Technology, Industrial and Social Sciences, Tokushima Univ., Japan, 2Inst. of Post-LED Photonics, Tokushima Univ., Japan

30PS-93* Selective arrangement of vesicles on artificial lipid membrane by biotin-avidin interaction

K. Hashino1, D. Mombayashi1, Y. Nakatani1, A. Oshima2, M. Yamaguchi2, A. Heya1 and K. Sumitomo1
1Univ. of Hyogo, Japan, 2NTT Basic Research Laboratories and Bio-Medical Informatics Research Center, NTT Corporation, Japan

30PS-94 Interaction between phenol derivatives with virucidal effects and murine noroviruses

V. R. Kudkyal1, I. Matsuura2, H. Hiramatsu3, K. Hayashi2 and T. Kawahara1,2
1Graduate School of Engineering, Chubu Univ., Japan, 2College of Life and Health Sciences, Chubu Univ., Japan
30PS-95* Photoresponse Mechanism of a free-standing lipid bilayer membrane doped with fullerene derivatives
  T. Ma, X. Feng, D. Tadaki and A. H.-Iwata
  Tohoku Univ., Japan

30PS-96* Single Molecule Observation of Amyloid β Aggregation on Lipid Membrane under Non-equilibrium Opened System
  A. Iida and H. Nabika
  Yamagata Univ., Japan

30PS-97 Distinct adsorbed states of adenine on gold nanoparticles at various pH solutions using flocculation-surface enhanced Raman scattering
  T. Yoshimoto, M. Seki and M. Futamata
  Saitama Univ., Japan

30PS-98* Optical condensation of living bacteria with bubble-mimetic solid-liquid interface
  K. Hayashi1,2,3, M. Tamura2,4, S. Tokonami2,3 and T. Iida1,2
  1Graduate School of Science, Osaka Prefecture Univ., Japan, 2Research Inst. for Light-induced Acceleration System (RILACS), Osaka Prefecture Univ., Japan, 3Graduate School of Engineering, Osaka Prefecture Univ., Japan, 4Osaka Univ., Japan

30PS-99* Artificial lipid bilayer system on ion image sensor for statistical ion channel measurement
  F. Takeuchi, T. Horio, T. Hattori, K. Sawada and R. Tero
  Toyohashi Univ. Tech., Japan

30PS-100* Controlling Efficiency of Graphene Oxide Quenching to Lipid Bilayer
  J. M. Y. Lau1, K. Kanomata2, F. Hirose2 and R. Tero1
  1Toyohashi Univ. Tech., Japan, 2Yamagata Univ., Japan

30PS-101* Microdomain formation in cholesterol-containing lipid bilayers induced by polyunsaturated lipids
  M. W. S. Goh and R. Tero
  Toyohashi Univ. Tech., Japan
01aA  Physics at surfaces and thin films

Chair: A. Takayama (Waseda Univ.)

8:40-9:00  01aA-1  Metal-insulator transition in hydrogenated RNiO₃
L. Matsuzawa¹, Y. Nishiyashi¹, T. Ozawa¹, U. Sidik², A. Hattori², H. Tanaka³ and K. Fukutani¹,³
¹The Univ. of Tokyo, Japan, ²Osaka Univ., Japan, ³Japan Atomic Energy Agency, Japan

9:00-9:20  01aA-2  Alkali-metal induced surface metallization of the Mott insulator Ca₂RuO₄ studied by angle-resolved photoemission spectroscopy
M. Horio¹,², D. Sutter³, F. Forte³, C. G. Fatuzzo³, S. Moser³, R. Fittipaldi³, A. Vecchione³, V. Granata¹, Y. Sassa³, G. Gatti³, M. Grioni³, H. M. Ronnow⁴, M. Hoesch⁵,¹, J. Chang⁵ and I. Matsuda¹
¹The Univ. of Tokyo, Japan, ²Univ. of Zurich, Switzerland, ³Univ. of Salerno, Italy, ⁴Swiss Federal Inst. of Technology in Lausanne, Switzerland, ⁵Diamond Light Source, UK

9:20-9:40  01aA-3  Mott transition in Ca₂RuO₄ driven by surface carrier doping: an x-ray photoelectron spectroscopy study
T. Wada¹, M. Horio¹, Y. Kudo¹, V. Granata², R. Fittipaldi³, A. Vecchione³, J. Chang⁵ and I. Matsuda¹
¹The Univ. of Tokyo, Japan, ²Univ. of Salerno, Italy, ³Univ. of Zurich, Switzerland

9:40-10:00  01aA-4  Spatial Control of Charge Doping in n-Type Topological Insulators
K. Sakamoto¹,², H. Ishikawa¹, T. Wake¹, C. Ishimoto², J. Fujii¹, H. Bentmann², M. Ohtaka², K. Kuroda², N. Inoue², T. Hattori¹, T. Miyamachi², F. Komori², R. Ota², F. Matsui¹, F. Reinert², J. Avila² and M. C. Asensio⁹
¹Osaka Univ., Japan, ²Chiba Univ., Japan, ³Istituto Officina dei Materiali (IOM)-CNR, Laboratorio TASC, Italy, ⁴Università Würzburg, Germany, ⁵The Univ. of Tokyo, Japan, ⁶Saga Univ., Japan, ⁷Instit. for Molecular Science, Japan, ⁸Synchrotron SOLEIL, France, ⁹Materials Science Inst. of Madrid, Spain

01aB  Surface chemistry

Chair: H. Imada (RIKEN)

8:40-9:20  01aB-1 (I)  Selective hydrogenation reactions over a Pd-Cu(111) single-atom alloy studied with ambient pressure infrared spectroscopy
M. K. A.-Rahman, C. M. Kruppe, A. Islam and M. Trenary
Univ. of Illinois at Chicago, USA

9:20-9:40  01aB-2  Stereodirecting Interactions in Chiral Amine/α-Ketoester Complexes on Pt(111)
P. H. McBrein¹, Y. Zeng¹, J.-C. Lemay¹, J. Dong¹, J. Garcia² and M. N. Groves²
¹Laval Univ., Canada, ²California State Univ. Fullerton, USA

9:40-10:00  01aB-3  Surface Kinetics of Catalysis for Methane Activation
H. Nakamishib¹,², S. M. Aspera¹, R. L. Arevalo¹ and H. Kasai¹
¹Akashi College, Japan, ²The Univ. of Tokyo, Japan, ³Osaka Univ., Japan
Online Room C

01aC  Nanotechnology and nanomaterials

Chair: D. H.-Pinilla (National Inst. for Materials Science)

8:40-9:00  01aC-1  Stepwise conductance control via gradual crystallization in amorphized pure niobium nanocontacts by nanosecond pulse-width voltage energization

Y. Ochiai, T. Obi, Y. Tsuruoka and T. Kizuka
Tsukuba Univ., Japan

9:00-9:20  01aC-2  Noble metal-based plasmonic nanostructures for visible-light driven catalytic reactions

P. Verma, Y. Kuwahara, K. Mori and H. Yamashita
Osaka Univ., Japan

9:20-10:00  01aC-3 (I)  Probing the Photo-catalytic CO2 Reduction on Low-dimensional Nano-catalysts via in situ and Operando Spectroscopies

1 Center for Condensed Matter Sciences, National Taiwan Univ., Taiwan, 2 Center of Atomic Initiative for New Materials, National Taiwan Univ., Taiwan, 3 Inst. of Atomic and Molecular Sciences, Academia Sinica, Taiwan, 4 Hindustan Inst. of Technology and Science, India

Online Room D

01aD  Operando surface science

Chair: M. Niibe (Univ. of Hyogo)

8:40-9:20  01aD-1 (I)  Operando soft x-ray spectroscopy characterization of surfaces and interfaces

J. Guo
Advanced Light Source, Lawrence Berkeley National Laboratory, USA

9:20-9:40  01aD-2  In situ XAFS analysis of growth process of single-walled carbon nanotubes from Co and Fe catalysts

1 Department of Applied Chemistry, Meijo Univ., Japan, 2 Nanomaterial Research Center, Meijo Univ., Japan, 3 Department of Materials Science and Engineering, Meijo Univ., Japan

9:40-10:00  01aD-3  Real-time Surface Potential Measurement during Evaporation of Alq3 Film Studied by Rotary Kelvin Probe

M. Ohara, Y. Tanaka and H. Ishii
Chiba Univ., Japan
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<td>Exfoliation of Interface in Carbon Fiber Reinforced Plastics by MD Simulation</td>
<td>K. Suzuki(^1) and T. Yamamoto(^2)</td>
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<td>1Department of Electrical Engineering, Tokyo Univ. of Science, Japan</td>
<td>2Department of Physics, Tokyo Univ. of Science, Japan</td>
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<td>Nov. 29</td>
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<td>Electrochemically-Induced Electronic and Structural Properties of the Electrode-Monolayer-Electrolyte Interface</td>
<td>R. A. Wong(^1), Y. Yokota(^1), M. Wakisaka(^2), J. Inukai(^1) and Y. Kim(^1)</td>
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<td>Nanoscale characterization of porous organic thin films fabricated at the air/liquid interface</td>
<td>K. Yamanami, K. Matsui, R. Asari and T. K. Shimizu</td>
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<td>Air-Water Interface Structure of Saponin by Sum Frequency Generation Spectroscopy</td>
<td>Y. Kagiyama and T. Miyama</td>
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<td>S. Tanji(^1), J. Yamada(^1), S. Kawada(^2), S. Sasaki(^1) and M. Miyatake(^1)</td>
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<td>S. Kawada(^1), M. Miyatake(^2) and S. Sasaki(^3)</td>
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<td>T. Sekiguchi, K. Yokoyama and T. Yaita</td>
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O. Endo1,2, F. Matsui3, W.-J. Chun4, M. Nakamura5, K. Amemiya6, and H. Ozaki1
1Tokyo Univ. of Agriculture and Technology, Japan, 2UVSOR Synchrotron Facility, Inst. for Molecular Science, Japan, 3International Christian Univ., Japan, 4Chiba Univ., Japan, 5KEK-PF, IMSS, Japan

01PS-13 Near-IR spectroscopic observation of Mg(OH): dehydration and MgO hydration
M. Takeuchi1, A. Kondo1,2, R. Kurosawa3 and J. Ryu1
1Osaka Prefecture Univ., Japan, 2Ube Material Industries, Ltd., Japan, 3Chiba Univ., Japan

01PS-14 Faster method of photoelectron intensity calculation based on multiple scattering theory
M. Haniuda, M. Nozaki and K. Niki
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01PS-15 Slow electrons (<100 eV) for Probing the Surface Localized Structure of TiO2: Photocatalysts
M. Honda, K. Goto and Y. Ichikawa
Nagoya Inst. of Technology, Japan

01PS-16* Analyses of Braying-induced Surface Amorphization of Titania Particles through Energy-resolved Distribution of Electron Traps
M. Takashima1,2, G. Chen1 and B. Ohtani1,2
1Inst. for Catalysis, Hokkaido Univ., Japan, 2Graduate School of Environmental Science, Hokkaido Univ., Japan

01PS-17 pH modulation in adhesive cells with a protonic biotransducer
M. Cui1, Y. Chen1, B. Liu1, D. Chen1 and T. Miyake1,2
1Waseda Univ., Japan, 2PRESTO, Japan Science and Technology Agency, Japan

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K. Kawaguchi1, T. Segawa1, K. Omi1, K. Ishii1 and H. Satone2
1Japan Atomic Energy Agency, Japan, 2Univ. of Hyogo, Japan

01PS-19* Dissociation Kinetics of Hydrogen Trapped in High-Dose Hydrocarbon-Molecular-Ion-Implanted Region during Rapid Thermal Annealing
T. Kadono1,2, R. Okuyama1, R. Hirose1, K. Kobayashi1, A. Masada1, A. Suzuki1, Y. Koga1, A. Fukuyama2 and K. Kurita1
1SUMCO Corporation, Japan, 2Univ. of Miyazaki, Japan

01PS-20 Development of variable-magnification imaging technique using soft x-ray reflectivity
M. S.-Sakamaki1 and K. Amemiya2,3
1Gunma Univ., Japan, 2High Energy Accelerator Research Organization, Japan, 3SOKENDAI(The Graduate Univ. for Advanced Studies), Japan

01PS-21 Study on Local Thermophysical Property of PMMA/PVDF Blends Using Atomic Force Microscopy
A. Naruke1,2, X. Liang1 and K. Nakajima1
1Tokyo Inst. of Technology, Japan, 2KONICA MINOLTA, INC., Japan

01PS-22* Reversible and Efficient Rough Plasmonic Probes by Exploiting Oxidation and Reduction Processes for Tip-Enhanced Raman Spectroscopy
V. K. Rao and M. Yoshimura
Surface Science Laboratory, Toyota Technological Inst., Japan

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01PS-23* Study on mutarotation of glucose during microwave irradiation
T. Maeda and Y. Asakuma
Univ. of Hyogo, Japan

01PS-24* Improvement of nano-particle synthesis process by two-stage microwave irradiation and surfactant addition
T. Takai, A. Shibatani and Y. Asakuma
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<td>¹PHC Corporation, Japan, ²Tokushima Univ., Japan</td>
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<td>¹School of Materials Science, Japan Advanced Inst. of Science and Technology, Japan, ²Kanazawa Univ., Japan</td>
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<td>¹Graduate School of Environmental Science, Hokkaido Univ., Japan, ²Faculty of Environmental Earth Science, Hokkaido Univ., Japan</td>
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<td>¹Japan Advanced Inst. of Science and Technology, Japan, ²Kyushu Univ., Japan, ³Kyoto Univ., Japan, ⁴International Inst. for Carbon-Negative Energy Research, Japan, ⁵The Ultramicroscopy Research Center, Japan</td>
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<td>¹Grad. Sch. of Nat. Sci. and Technol., Kanazawa Univ., Japan, ²Institut Teknologi Sumatera (ITERA), Indonesia, ³Inst. of Science and Engineering, Kanazawa Univ., Japan</td>
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<td>Imaging of a magnetic card using a scanning diamond NV center probe</td>
<td>C. Tachioka¹, P. Kumar¹, A. Ideguchi¹, S.-W. Kim², K. Koyama², K. Hayashi¹, Y. Kainuma¹ and T. An¹</td>
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<td>¹Japan Advanced Inst. of Science and Technology (JAIST), Japan, ²Adamant Namiki Precision Jewel Co., Ltd., Japan</td>
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01PS-37* Toward Operando Observation of Li-Ion Battery by Scanning Transmission Electron Microscopy

Y. Takagi¹, K. Aso¹, H. Ito², M. Hirayama², R. Kanno² and Y. Oshima¹
¹Japan Advanced Inst. of Science and Technology, Japan, ²Tokyo Inst. of Technology, Japan

01PS-38 Visible-Light-Driven Photocatalytic Hydrogen Evolution Using Ti-Based MOFs with Linker Defects

Y. Horiuchi¹, K. Tatemaki¹, S. Mine² and M. Matsuoka¹
¹Osaka Prefecture Univ., Japan, ²Hokkaido Univ., Japan

01PS-39 Dependence of Ge Nanowire Height Selectively-Grown by Vaper-Liquid-Solid on Au Catalyst Diameter Periodically-Located on Si (111) Surface

D. Goto¹, M. Makino¹, R. Horiguchi¹, W. Jevasuwan², N. Fukata² and S. Hara¹
¹Hokkaido Univ., Japan, ²National Inst. for Materials Science, Japan

01PS-40 Fabrication of graphene aerogel with controllable structural properties for efficient dye absorption

T. Shimizu, K. K. H. De Silva, M. Hara and M. Yoshimura
Toyota Technological Inst., Japan

01PS-41 Improving Oxygen Evolution Reaction Performance and Durability using Rhombic Dodecahedral Pt₃(Ni, X) Nanoparticles with Metal Oxide Supports

C. A. Tadgell, M. Kato and I. Yagi
Hokkaido Univ., Japan

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Y. Kondo¹, Y. Kuwahara¹²³, K. Mori¹² and H. Yamashita¹²
¹Osaka Univ., Japan, ²Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto Univ., Japan, ³PRESTO, Japan Science and Technology Agency (JST), Japan

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Chair: Y. Nakayama (Tokyo Univ. Sci.)

01PS-43* Controlling the N-doping Sites in Carbon Dot (CD) for Direct White Light Emission (WLE)

B. K. Barman¹ and T. Nagao¹²
¹International Center for Materials Nanoarchitectonics (MANA), National Inst. for Materials Science (NIMS), Japan, ²Hokkaido Univ., Japan

01PS-44 HAXPES study on chemical states of reaction films formed on metal surfaces by zinc dialkyldithiophosphate and molybdenum dialkyldithiocarbamate

Y. Iwanami¹, N. Kimura¹, K. Tagawa¹ and S. Yasuno²
¹ENEOS Corporation, Japan, ²Japan Synchrotron Radiation Research Inst., Japan

01PS-45* Chemical state analysis of diamond surface polished by Ultraviolet-Ray Aided Machining

D. Yamashita¹, Y. Hasegawa¹, K. Mitsuhara¹, M. Takizawa¹ and T. Tanaka²
¹Department of Physical Sciences, Faculty of Science and Engineering, Ritsumeikan Univ., Japan, ²Research Organization of Science and Technology, Ritsumeikan Univ., Japan

01PS-46* In-situ Vibrational Observation of a Superconcentrated Electrolyte/Electrode Interface

M. Nagasaka, K. Ikeda and K. Motobayashi
Nagoya Inst. of Technology, Japan

01PS-47* Ultrafast spectral diffusion of excitons in thin films of molecular aggregates

T. Yoshida and K. Watanabe
Kyoto Univ., Japan

01PS-48* Self-assembly mechanism of tetrapod-shaped molecules on a surface for constructing three-dimensional interfacial architecture

S. Tanaka and H. Asakawa
Kanazawa Univ., Japan
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   \textsuperscript{1}Coll. Sci., Rikkyo Univ., Japan, \textsuperscript{2}Research Center for Smart Molecules, Rikkyo Univ., Japan

01PS-50*  STM Visualization of Frontier Molecular Orbital Separation of a Single TADF Emitter
   I. Zoh\textsuperscript{1,2}, M. I.-Imada\textsuperscript{1}, J. Bae\textsuperscript{1}, H. Imada\textsuperscript{1,4}, Y. Tsushiya\textsuperscript{1}, C. Adachi\textsuperscript{1} and Y. Kim\textsuperscript{1}
   \textsuperscript{1}SISL, RIKEN, Japan, \textsuperscript{2}Seoul National Univ., Republic of Korea, \textsuperscript{3}Kyushu Univ., Japan, \textsuperscript{4}PRESTO, JST, Japan

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   H. Saito
   Tokyo Denki Univ., Japan

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   E. H. Otal\textsuperscript{1}, M. L. Kim\textsuperscript{1} and M. Kimura\textsuperscript{1,2,3}
   \textsuperscript{1}Department of Chemistry and Materials, Faculty of Textile Science and Technology, Shinshu Univ., Japan,
   \textsuperscript{2}COI Aqua-Innovation Center, Shinshu Univ., Japan, \textsuperscript{3}Research Initiative for Supra-Materials, Shinshu Univ., Japan

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01PS-56  Lateral force microscopy utilizing bimodal qPlus AFM with a long probe
   Y. Yamada\textsuperscript{1}, T. Ichii\textsuperscript{1}, T. Utsunomiya\textsuperscript{1}, K. Kimura\textsuperscript{2}, K. Kobayashi\textsuperscript{2}, H. Yamada\textsuperscript{2} and H. Sugimura\textsuperscript{1}
   \textsuperscript{1}Dept. of Mater. Sci. & Eng., Kyoto Univ., Japan, \textsuperscript{2}Dept. of Electronic Sci. & Eng., Kyoto Univ., Japan

01PS-57*  Thickness Dependent Metal-Insulator Transition in Ru Nanosheets Probed by Low-Energy Inverse Photoelectron Spectroscopy
   K. Kawamura\textsuperscript{1}, D. Ootsuki\textsuperscript{2}, T. Ishida\textsuperscript{2}, T. Yoshida\textsuperscript{2}, M. Morita\textsuperscript{3}, K. Fukuda\textsuperscript{3} and H. Yoshida\textsuperscript{1,4}
   \textsuperscript{1}Grad. Sch. of Eng., Chiba Univ., Japan, \textsuperscript{2}Grad. Sch. of Human and Environ. studies, Kyoto Univ., Japan,
   \textsuperscript{3}Office of Society-Academia Collab. for Innovation, Kyoto Univ., Japan, \textsuperscript{4}Molecular Chirality Research Center, Chiba Univ., Japan

01PS-58*  Development of LaB\textsubscript{6}-based metasurface for infrared applications
   T. D. Ngo\textsuperscript{1,2}, T. P. Tran\textsuperscript{1,2}, D. H. Ngo\textsuperscript{1,2} and T. Nagao\textsuperscript{1,2}
   \textsuperscript{1}International Center for Materials Nanoarchitectonics, NIMS, Japan, \textsuperscript{2}Hokkaido Univ., Japan

01PS-59  Effect of Atomic Hydrogen Exposure on Hydrogenated Amorphous Carbon Films
   Y. Haruyama\textsuperscript{1}, D. Morimoto\textsuperscript{1}, A. Heya\textsuperscript{2}, K. Sumitomo\textsuperscript{2}, S. Ito\textsuperscript{2}, K. Yokota\textsuperscript{1} and M. Tagawa\textsuperscript{1}
   \textsuperscript{1}LASTI, Univ. of Hyogo, Japan, \textsuperscript{2}Grad. School of Eng., Univ. of Hyogo, Japan, \textsuperscript{3}Kobe Univ., Japan

01PS-60*  Formation of Si-hydroxide surface during Si-water reaction
   S. Nishimura\textsuperscript{1}, M. Nakamura\textsuperscript{2}, Y. Hasegawa\textsuperscript{1}, K. Mitsuhara\textsuperscript{1}, M. Takizawa\textsuperscript{1} and E. Yamasue\textsuperscript{2}
   \textsuperscript{1}Department of Physical Sciences, Faculty of Science and Engineering, Ritsumeikan Univ., Japan,
   \textsuperscript{2}Department of Mechanical Engineering, Faculty of Science and Engineering, Ritsumeikan Univ., Japan

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  Osaka Univ., Japan

01PS-63  How do Macroscopic Objects Begin to Slide? - Relation between Precursor Slip and Friction Coefficient -
  W. Iwashita, H. Matsukawa and M. Otsuki
  Osaka Univ., Japan, Aoyama Gakuin Univ., Japan

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  X. Zhang, S. Kumar, K. Namura and M. Suzuki
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01PS-65  Resistance minimum due to Kondo effect and Anderson localization in PdHₙ ultrathin films
  T. Ozawa, R. Shimizu, T. Hitosugi and K. Fukutani
  ¹The Univ. of Tokyo, Japan, ²Tokyo Inst. of Technology, Japan, ³Japan Atomic Energy Agency, Japan

01PS-66*  Determining Fundamental Losses in Ta₃N₅ nanorods Photoanodes for Efficient Solar Water Oxidation
  V. Nandal, Y. Pihosh, T. Higashi, K. Seki and K. Domen
  ¹Global Zero Emission Research Center, National Inst. of Advanced Industrial Science and Technology, Japan,
  ²The Univ. of Tokyo, Japan

01PS-67*  Molecular dynamics simulations of load dependence of sliding friction on monolayer sumanene adsorbed onto Au surface
  R. Minowa, R. Matsuyama, H. Sakurai and N. Sasaki
  ¹The Univ. of Electro-Communications, Japan, ²Osaka Univ., Japan

01PS-68*  Development of an in-situ Electrical Transport Masurement System Combined with UHV Scanning Tunneling Microscope at Low Temperatures in High-Magnetic Fields
  ¹Kanazawa Univ., Japan, ²Univ. of Stuttgart, Germany

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  ¹Kanazawa Univ., Japan, ²Univ. of Tokyo, Japan, ³Physikalisches Institut, Karlsruhe Inst. of Technology, Japan, ⁴Univ. of Tsukuba, Japan

01PS-70  Lubrication and Related Dynamics at Nanoscale Incommensurate Interfaces
  T. Kawaguchi
  Toho Univ., Japan

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01PS-71  High-throughput electronic structure analysis of Fe-Ti-O ternary system using photoemission electron microscopy
  ¹Tokyo Univ. of Science, Japan, ²JASRI, Japan

01PS-72  Prediction of unknown peptide TOF-SIMS spectra by machine learning of small peptide data set
  S. Aoyagi, K. Kamochi, T. Yoshinari and K. Hasegawa
  Seikei Univ., Japan

01PS-73*  Study of ultrafast demagnetization in the Gd₃Fe₂₀Co₁₀ crystal by Landau-Lifshitz-Gilbert simulation
  T. Seno, T. Sumi, M. Horio, S. EL MOUSSAOUI, A. Tsukamoto and I. Matsuda
  ¹The Univ. of Tokyo, Japan, ²Nihon Univ., Japan
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<td>¹National Inst. of Advanced Industrial Science and Technology (AIST), Japan, ²Osaka Univ., Japan, ³Riken Center for Computational Science, Japan</td>
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<td>¹Graduate School of Science and Engineering, Chiba Univ., Japan, ²Center for Frontier Science, Chiba Univ., ³Molecular Chirality Research Center, Chiba Univ., Japan</td>
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<td>¹LASTI, Univ. of Hyogo, Japan, ²MAX IV laboratory, Lund Univ., Sweden</td>
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<td>¹Graduate School of Science, Univ. of Hyogo, Japan, ²LASTI, Univ. of Hyogo, Japan, ³Mazda Motor Corp., Japan</td>
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<td>Laboratory Diffracted X-ray Blinking to Monitor Molecular Dynamics on Polymer</td>
<td>R. Inamasu¹, T. Arii²,³, H. Yamaguchi¹, D. Sasaki², A. S.-Tomita⁴, H. Sekiguchi⁵, K. Mio⁵, S. Tsuda⁶,⁷, M. Kuramochi⁶,⁷ and Y. C. Sasaki⁶,⁷</td>
<td>¹Technology and Innovation Center, Daikin Industries, Ltd., Japan, ²The Univ. of Tokyo, Japan, ³AIST UTokyo Advanced Operando Measurement Technology Open Innovation Laboratory, National Inst. of Advanced Industrial Science and Technology, Japan, ⁴Jichi Medical Univ., Japan, ⁵Center for Synchrotron Radiation Research, Japan Synchrotron Radiation Research Inst., Japan, ⁶Bioproduction Research Inst., National Inst. of Advanced Industrial Science and Technology, Japan, ⁷HokkaidoUniv., Japan</td>
</tr>
</tbody>
</table>
01PS-84* Fabrication and nanoscale properties of zigzag graphene nanoribbon
T. Yokosawa¹, T. Ochi¹, Y. Koga², R. Takehara², M. Kamada¹, M. Hará¹ and T. Matsui¹
¹Advanced Research Laboratory, Anritsu corporation, Japan, ²Graduate School of Science and Technology, Kumamoto Univ., Japan, ³Faculty of Advanced Science and Technology, Kumamoto Univ., Japan, ⁴Inst. of Industrial Nanomaterials, Kumamoto Univ., Japan

01PS-85 Evaluation of oxygen-free silver/palladium/titanium (Ag/Pd/Ti) nonevaporable getter (NEG) coating
T. Kikuchi¹, Y. Masuda², M. Ono³, Y. Sato⁴, Y. Nakayama³, K. Yoshioka¹, I. Yoshikawa¹, S. Ohno⁵ and K. Mase⁶
¹Inst. of Materials Structure Science, KEK, Japan, ²Tokyo Univ. of Science, Japan, ³Univ. of Tokyo, Japan, ⁴Yokohama National Univ., Japan, ⁵SOKENDAI (The Graduate Univ. for Advanced Studies), Japan

01PS-86 Dynamics of Surface chemistry of Beyond 5G devices under operation conditions
H. Fukidome
Tohoku Univ., Japan

01PS-87* Angular dependence of multi-atom resonance X-ray Raman scattering
J. Kogo, R. Sato and K. Niki
Chiba Univ., Japan

01PS-88 Nanoscale observation of operating SiC planar type MOSFET using AFM/KFM/SCFM
A. Doi, N. Satoh, and H. Yamamoto
Chiba Inst. of Technology, Japan

Energy and environmental science
Chair: H. Yasumatsu (Toyota Technological Inst.)

01PS-89 Electrocatalytic activity and volatile product selectivity for nitrate reduction at tin-modified Pt(100), Pd(100) and Pt-Pd(100) single crystalline electrodes in acidic media
I. Yagi⁷, Y. Unuma⁷, M. Okui⁷ and M. Kato
Hokkaido Univ., Japan

01PS-90 First-Principles Analysis on Band alignment of LiTi₂O₄ and SrTiO₃ to Understand Ion Diffusion Modulation via Substrate Choice
A. Nakanishi¹, K. Nishio², S. Ichinokura², K. Shimizu¹, Y. Kobayashi², N. Nakamura², D. Imazeki⁷, R. Shimizu², T. Hirarahar², T. Hitosugi² and S. Watanabe¹
¹The Univ. of Tokyo, Japan, ²Tokyo Inst. of Technology, Japan, ⁷PRESTO, Japan Science and Technology Agency, Japan

01PS-91 Formation of Iridium Oxide Nanoparticles on CVD Graphene studied by AFM
M. Hara³, S. Ogawa³, S. Suzuki³ and M. Yoshimura¹
¹Toyota Technological Inst., Japan, ²International Center for Young Scientists (ICYS), National Inst. for Materials Science (NIMS), Japan

01PS-92 Lithium map by Auger spectral-imaging method for all-solid-state lithium ion batteries
A. Tanaka¹, K. Ikita¹, T. Omoto¹, Y. Watase¹, Y. Eto¹, Y. Sasaki¹, K. Tsutsumi¹, R. Matsuda², K. Hikima² and A. Matsuda²
¹JEOL Ltd., Japan, ²Toyohashi Univ. of Technology, Japan

01PS-93 Evaluation of Photothermal Conversion of Nano-sized Black Carbons by Raman Spectroscopy
M. Yamamoto, M. Furusawa, M. Kaneda, Y. Homma and T. Yamamoto
Tokyo Univ. of Science, Japan

01PS-94 Soft X-ray Absorption, Emission and Photoelectron Spectroscopy of Ammonia Borane (NH₃BH₃)
M. Niibe¹, Y. Haruyama¹ and S. Ito²
¹LASTI, Univ. of Hyogo, Japan, ²Grad. School of Eng., Univ. of Hyogo, Japan
01PS-95  Collision-induced Etching of Polyimide in Sub-low Earth Orbit Space Environment: Verification through Ground-based Experiments  
M. Tagawa, W. Ide, A. Fujita, S. Horimoto and K. Yokota  
Kobe Univ., Japan

01PS-96  Collision-induced Etching of Polyimide in Sub-low Earth Orbit Space Environment: SLATS data implication  
K. Yokota¹, W. Ide¹, A. Fujita¹, S. Horimoto¹, Y. Kimoto², Y. Tsuchiya², A. Goto², K. Yukumatsu², E. Miyazaki² and M. Tagawa¹  
¹Kobe Univ., Japan, ²Japan Aerospace Exploration Agency, Japan

01PS-97* Investigation of the influence of a surface functional group against barnacle settlements using the 3D printed new experimental setup  
K. Mikami¹, J. Watanabe¹, T. Murosaki², Y. Nogata³, M. Shimomura¹ and Y. Hirai¹  
¹Chitose Inst. of Science and Technology, Japan, ²Asahikawa Medical Univ., Japan, ³Central Research Inst. of Electric Power Industry, Japan

01PS-98* Selectivity for surface functional groups in larvae of barnacles  
J. Watanabe¹, K. Mikami¹, T. Murosaki², Y. Nogata³, M. Shimomura¹ and Y. Hirai¹  
¹Chitose Inst. of Science and Technology, Japan, ²Asahikawa Medical Univ., Japan, ³Central Research Inst. of Electric Power Industry, Japan

01PS-99  Mass-Production of Nanoscale Zero-valent Copper in a Rotating Packed Bed with Blade Packings  
C.-C. Lin¹,² and Y. Zhong¹  
¹Chang Gung Univ., Taiwan, ²Chang Gung Memorial Hospital, Taiwan
01pA  Physics at surfaces and thin films

Chair: S. Yoshizawa (National Inst. for Materials Science)

13:00-13:20  01pA-1  Scaling law for the Rashba-type spin splitting in Ag/Au(111) quantum well films
R. Noguchi\textsuperscript{1,2,3}, K. Kuroda\textsuperscript{1}, M. Kawamura\textsuperscript{1}, K. Yaji\textsuperscript{4}, A. Harasawa\textsuperscript{1}, T. Imori\textsuperscript{1}, F. Komori\textsuperscript{1}, S. Shin\textsuperscript{1}, T. Ozaki\textsuperscript{1} and T. Kondo\textsuperscript{1}
\textsuperscript{1}The Univ. of Tokyo, Japan, \textsuperscript{2}Inst. for Basic Science, Republic of Korea, \textsuperscript{3}Seoul National Univ., Republic of Korea, \textsuperscript{4}National Inst. for Materials Science, Japan

13:20-13:40  01pA-2  Electronic states of topological surface in Sb/Bi(111) interface studied by angle-resolved photoemission spectroscopy
H. Abe\textsuperscript{1}, M. Imamura\textsuperscript{2}, K. Takahashi\textsuperscript{2} and A. Takayama\textsuperscript{1}
\textsuperscript{1}Waseda Univ., Japan, \textsuperscript{2}Synchrotron Light Application Center, Saga Univ., Japan

13:40-14:00  01pA-3  Electronic structure of monolayer Cu\textsubscript{2}Si on Si(111) studied by ARPES
M. Sakamoto\textsuperscript{1}, Y. Tsujikawa\textsuperscript{1}, M. Imamura\textsuperscript{2}, K. Takahashi\textsuperscript{2} and A. Takayama\textsuperscript{1}
\textsuperscript{1}Waseda Univ., Japan, \textsuperscript{2}Synchrotron Light Application Center, Saga Univ., Japan

14:00-14:20  01pA-4  Origin of two-step photon absorption in GaAs thin film by first-principles spin-orbit calculations and STM/STS measurements
M. C. Escaño\textsuperscript{1}, M. H. Balgos\textsuperscript{2,3}, T. Q. Nguyen\textsuperscript{4}, E. A. Prieto\textsuperscript{5,6}, E. Estacio\textsuperscript{5}, A. Salvador\textsuperscript{5}, A. Somintac\textsuperscript{5}, R. Jaculbia\textsuperscript{3}, N. Hayazawa\textsuperscript{3,5}, Y. Kim\textsuperscript{3,5} and M. Tani\textsuperscript{1}
\textsuperscript{1}Univ. of Fukui, Japan, \textsuperscript{2}Innovative Photon Manipulation Research Team, RIKEN Center for Advanced Photonics, Japan, \textsuperscript{3}Surface and Interface Science Laboratory, RIKEN, Japan, \textsuperscript{4}Osaka Univ., Japan, \textsuperscript{5}National Inst. of Physics, Univ. of the Philippines, Republic of the Philippines, \textsuperscript{6}Materials Science and Engineering Program, Univ. of the Philippines, Republic of the Philippines

14:20-14:40  01pA-5  Monolayer Heavy-Fermion Compound CePt\textsubscript{6}/Pt(111)
K. Ienaga\textsuperscript{1,2}, S. Kim\textsuperscript{1,3}, T. Miyamachi\textsuperscript{1,4} and F. Komori\textsuperscript{1,5}
\textsuperscript{1}Inst. for Solid State Physics, Univ. of Tokyo, Japan, \textsuperscript{2}Tokyo Inst. of Technology, Japan, \textsuperscript{3}Korea Adv. Inst. of Sci. and Tech. Republic of Korea, \textsuperscript{4}Nagoya Univ., Japan, \textsuperscript{5}Inst. of Industrial Science, Univ. of Tokyo, Japan

14:40-15:00  01pA-6  First-principles study of In double layers on Si(111)√7×√3-B substrates
I. Seo\textsuperscript{1}, K. Nakatsuji\textsuperscript{1}, H. Hirayama\textsuperscript{2} and Y. Gohda\textsuperscript{1}
\textsuperscript{1}Department of Materials Science and Engineering, Tokyo Tech, Japan, \textsuperscript{2}Department of Physics, Tokyo Tech, Japan

01pA  Physics at surfaces and thin films

Chair: F. Komori (The Univ. of Tokyo)

15:20-15:40  01pA-7  Role of steps on superconductor-insulator transition in mono-atomic-layer metal films grown on semiconducting substrates
Y. Sato\textsuperscript{1}, M. Haze\textsuperscript{1}, S. Yoshizawa\textsuperscript{2}, T. Uchihashi\textsuperscript{1} and Y. Hasegawa\textsuperscript{1}
\textsuperscript{1}The Inst. for Solid State Physics, The Univ. of Tokyo, Japan, \textsuperscript{2}Research Center for Advanced Measurement and Characterization, National Inst. for Materials Science, Japan

15:40-16:00  01pA-8  Electron Standing Waves of Si(111)-(√7 × √3)-In Imaged by Scanning Tunneling Microscopy
S. Yoshizawa and K. Sagisaka
National Inst. for Materials Science, Japan

16:00-16:40  01pA-9  Quantum excitations and forces explored by scanning probe methods
J. Kröger
Technische Universität Ilmenau, Germany
01pB  Surface chemistry

Chair: H. Kondoh (Keio Univ.)

13:00-13:20  01pB-1  Development of Fluorescence-yield Wavelength-dispersive Soft X-ray Absorption Spectroscopy for Real-time Observation of Surface Chemical Reaction

K. Amemiya¹, K. Sakata¹ and M. S.-Sakamaki²
¹High Energy Accelerator Research Organization, Japan, ²Gunma Univ., Japan

13:20-13:40  01pB-2  Changes of rate-limiting reactions with progress of the reduction process on oxidized Ni(111)

S. Ogawa¹,², R. Taga³, R. Yusa³, Y. Tsuda¹, T. Sakamoto¹, A. Yoshigoe³, Y. Takakuwa⁴ and T. Abukawa¹,²
¹SRIS, Tohoku Univ., Japan, ²IMRAM, Tohoku Univ., Japan, ³Japan Atomic Energy Agency, Japan, ⁴μSIC, Tohoku Univ., Japan

13:40-14:00  01pB-3  Detection of unstable intermediates for CO₂ conversion into methanol on a Cu(111) model catalyst

K. Takeyasu¹,², Y. Sawaki³, R. Kojima³, T. Imabayashi³, J. Quan⁴, T. Kondo¹,², T. Fujitani⁵ and J. Nakamura¹
¹Department of Materials Science, Faculty of Pure and Applied Sciences, Univ. of Tsukuba, Japan, ²TSukuba Research Center for Energy Materials Science, Univ. of Tsukuba, Japan, ³Graduate School of Science and Technology, Univ. of Tsukuba, Japan, ⁴Department of Dynamics at Surfaces, Max Planck Inst. for Biophysical Chemistry, Germany, ⁵National Inst. of Advanced Industrial Science and Technology, Japan

Chair: A. Itakura (National Inst. for Materials Science)

14:00-14:20  01pB-4  A role of rotational energy transfer in H₂ ortho-para conversion

H. Ueta¹ and K. Fukutani¹,²
¹Advanced Science Research Center, Japan Atomic Energy Agency, Japan, ²Inst. of Industrial Science, The Univ. of Tokyo, Japan

14:20-14:40  01pB-5  Microelectrode-based Transient Amperometry of O₂ Evolution on a SrTiO₃ Photocatalyst Excited under Water

T. Kosaka¹, Y. Zhou², T. Hisatomi³,⁴, H. Nishiyama⁵, K. Domen³,⁵, Y. Takahashi², and H. Onishi¹
¹Kobe Univ., Japan, ²Kanazawa Univ., Japan, ³Shinshu Univ., Japan, ⁴Japan Science and Technology Agency, Japan, ⁵The Univ. of Tokyo, Japan

14:40-15:00  01pB-6  Electrochemical ATR ultraviolet-visible spectroscopy applied for organic semiconductor/ionic liquid interface

I. Tanabe¹, I. Imoto¹, D. Okaue¹, M. Inami¹, S. Kumagai², T. Makita², M. Mitani², T. Okamoto², J. Takeya³ and K. Fukui¹,³
¹Osaka Univ., Japan, ²The Univ. of Tokyo, Japan, ³Inst. of Molecular Science, Japan

01pB  Surface chemistry

Chair: T. Kumagai (Fritz Haber Inst.)

15:20-15:40  01pB-7  Direct Observation of Local Corrosion around the Al-Fe Intermetallic Particle in the Al Alloy by In-liquid Open-loop Electric Potential Microscopy

K. Hira³, T. Okamoto¹, T. Kitagawa¹, T. Ozawa¹ and T. Fukuma¹
¹Kanazawa Univ., Japan, ²KOBE STEEL, LTD., Japan

15:40-16:00  01pB-8  Characterization of nitric oxide molecules on copper nitride using scanning probe microscopy

R. Zhang¹, M. Fukuda², T. Ozaki², and Y. Sugimoto¹
¹The Univ. of Tokyo, Japan, ²Inst. for Solid State Physics, The Univ. of Tokyo, Japan
16:00-16:20  01pB-9  Gap mode induced catalytic reactions of substituted thiophenol adsorbed on silver
M. Futamata, K. Tabei and K. Akai
Saitama Univ., Japan

16:20-16:40  01pB-10  Nanomechanical control of helicity inversion of helicene-terminated graphene nanoribbons by atomic force microscopy
A. Shiotari\textsuperscript{1,2}, A. Ishii\textsuperscript{1} and Y. Sugimoto\textsuperscript{1}
\textsuperscript{1}The Univ. of Tokyo, Japan; \textsuperscript{2}Fritz-Haber Inst. of the Max-Planck Society, Germany

Online Room C

01pC  Nanotechnology and nanomaterials / Physics at surfaces and thin films
Chair: T. Nagao (National Inst. for Materials Science)

13:00-13:20  01pC-1  Mechanism of anisotropy of nano-scale friction based on mathematical definition of nano-scale contact
K. Hiro and N. Sasaki
Univ. Electro-Commun., Japan

13:20-13:40  01pC-2  Role of intermolecular interactions in NO chemisorption on Cu(111)
T. N. Pham\textsuperscript{1}, Y. Hamamoto\textsuperscript{1,2}, K. Inagaki\textsuperscript{1,2}, I. Hamada\textsuperscript{1,2} and Y. Morikawa\textsuperscript{1,2,3}
\textsuperscript{1}Department of Precision Engineering, Osaka Univ., Japan; \textsuperscript{2}Elements Strategy Initiative for Catalysts and Batteries (ESICB), Kyoto Univ., Japan; \textsuperscript{3}Research Center for Precision Engineering, Graduate School of Engineering, Osaka Univ., Japan

13:40-14:00  01pC-3  Emission enhancement mechanism of surface plasmon resonance of Ag nanoparticles on GaN-based semiconductors
S. Kaito\textsuperscript{1}, T. Matsuyama\textsuperscript{1}, K. Wada\textsuperscript{1}, M. Funato\textsuperscript{2}, Y. Kawakami\textsuperscript{1} and K. Okamoto\textsuperscript{1}
\textsuperscript{1}Osaka Prefecture Univ., Japan; \textsuperscript{2}Kyoto Univ., Japan

14:00-14:20  01pC-4  High-resolution imaging of optical property of pentacene thin-film by photo-induced force microscopy using gap-mode plasmon
T. Yamamoto, K. Fukuzawa and Y. Sugawara
Osaka Univ., Japan

14:20-15:00  01pC-5 (R)  Atomic-Scale Optical Spectroscopy in Plasmonic Scanning Tunneling Microscope Junctions
T. Kumagai\textsuperscript{1,2}
\textsuperscript{1}Center for Mesoscopic Sciences, Inst. for Molecular Science, Japan; \textsuperscript{2}Fritz-Haber Inst. of the Max-Planck Society, Germany

01pC  Nanotechnology and nanomaterials / Physics at surfaces and thin films
Chair: S. Ichinokura (Tokyo Inst. of Technology)

15:20-15:40  01pC-6  A scanning NV center magnetometry probe using high purity diamond fabricated by FIB
Y. Kainuma\textsuperscript{1}, A. Ideguchi and T. An
Japan Advanced Inst. of Science and Technology, Japan

15:40-16:00  01pC-7  Soft-magnetic skyrmions induced by surface-state coupling in a sandwich structure with an intrinsic ferromagnetic topological insulator
T. Takashiro\textsuperscript{1}, R. Akiyama\textsuperscript{1}, I. A. Kibirev\textsuperscript{2}, A. V. Matetskiy\textsuperscript{2}, R. Nakanishi\textsuperscript{1}, S. Sato\textsuperscript{1}, T. Fukasawa\textsuperscript{1}, T. Sasaki\textsuperscript{1}, H. Toyama\textsuperscript{1}, K. L. Hiwatari\textsuperscript{1}, A. V. Zotov\textsuperscript{2}, A. A. Saranin\textsuperscript{2}, T. Hirahara\textsuperscript{1} and S. Hasegawa\textsuperscript{1}
\textsuperscript{1}The Univ. of Tokyo, Japan; \textsuperscript{2}Inst. of Automation and Control Processes, Russia; \textsuperscript{3}Tokyo Inst. of Technology, Japan; \textsuperscript{4}National Inst. for Materials Science (NIMS), Japan
01pC-8 Visualization of Magnetic Structures without Spin Sensitivity in the Skyrmion Magnet GdRu2Si2


1Department of Advanced Materials Science, The Univ. of Tokyo Japan, 2RIKEN Center for Emergent Matter Science Japan, 3Inst. for Solid State Physics, The Univ. of Tokyo Japan, 4Department of Applied Physics, The Univ. of Tokyo Japan

01pD Operando surface science

Chair: O. Endo (Tokyo Univ. of Agriculture and Technology)

13:00-13:40 01pD-1 (I) Dynamically visualizing battery reactions by operando Kelvin probe force microscopy

N. Ishida
National Inst. for Materials Science, Japan

13:40-14:00 01pD-2 Ionic-Liquid-Originated Carrier Trapping Dynamics for the Electric Double-Layer Organic FET Revealed by Operando Interfacial Analyses


14:00-14:20 01pD-3 Development of Tip-Enhanced Raman Spectroscopy as an Analytical Tool for Electrochemical Interfaces

Y. Yokota, M. Hong, N. Hayazawa, E. Kazuma and Y. Kim

1RIKEN, Japan, 2JST PRESTO, Japan

14:20-14:40 01pD-4 Elucidation of Reactive Electrons in Photocatalytic Steam-methane Reforming by Operando IR Spectroscopy Synchronized with Chopped Illumination

H. Sato and T. Sugimoto

1Inst. for Molecular Science, Japan, 2The Graduate Univ. for Advanced Studies, SOKENDAI, Japan, 3Precursory Research for Embryonic Science and Technology (PRESTO), Japan Science and Technology Agency (JST), Japan

14:40-15:00 01pD-5 Crystal plane dependent ethanol gas sensing of ZnO studied by low-energy He+ ion scattering combined with pulsed jet technique

T. T. Suzuki, Y. Adachi, T. Ohgaki and I. Sakaguchi
National Inst. for Materials Science, Japan

01pD Operando surface science

Chair: A. Yoshigoe (Japan Atomic Energy Agency)

15:20-15:40 01pD-6 Influence of Local Structure of Ionic Liquid on Diffusion Behavior of Metal Ions Close to Electrode

A. Imanishi, S. Koyama, K. Yoshimoto and K. Fukui

1Osaka Univ., Japan, 2Inst. for Molecular Science, Japan

15:40-16:00 01pD-7 Operando- Photoelectron Yield Spectroscopy of Organic Field Effect Transistors to Investigate Negative Carrier States

H. Ishii, T. Maruyama, K. Ikegami, R. Kaimori and Y. Tanaka

1Graduate School of Science and Engineering, Chiba Univ. Japan, 2Center for Frontier Science, Chiba Univ., Japan, 3Molecular Chirality Research Center, Chiba Univ., Japan
01pD-8 (I) Catalytic Reactions Explored by the High Pressure X-ray Photoelectron Spectroscopy (HPXPS) Endstation POLARIS

P. Amann and A. Nilsson
AlbaNova Univ. Center, Stockholm Univ., Sweden

01pA The Heinrich Rohrer Medal Lecture (Grand medal)

Chair: I. Matsuda (The Univ. of Tokyo)

17:00-18:00 01pA-R Investigating the Quantum Magnetism of Atoms on Surfaces with Scanning Tunneling Microscopy

A. Heinrich\textsuperscript{1,2}

\textsuperscript{1}IBS Center for Quantum Nanoscience, Republic of Korea, \textsuperscript{2}Ewha Womans Univ., Republic of Korea