

The 2023 RIES-CEFMS (Research Institute for Electronic Science- Center for Emergent Functional Matter Science) Joint International Symposium

7-8 December 2023

Rusutsu Resort Hotel and Convention Center
*13 Izumikawa, Rusutsu-Mura, Abuta-Gun
Hokkaido, Japan*



Co-organized 5 (Five-Star Alliance) + 2 (CEFMS and RCAS) International Symposium

to Create the Future with People, Intelligence, and Materials
by the Network Joint Research Center for Materials and Devices (Five-Star Alliance) of Hokkaido University, Tohoku University, Tokyo Institute of Technology, Osaka University, and Kyushu University in cooperation with CEFMS, National Yang-Ming Chiao Tung University, and the Research Center for Applied Sciences (RCAS), Academia Sinica

Program

Day 1 (7 December 2023)

Session 1

Chair: Prof. Yuta Takano

19:30-19:35: **Symposium remarks** (Prof. Vasudevan P. Biju, Symposium Chair, RIES, Hokkaido University)

19:35-19:40: **Opening remarks** (Prof. Kuniharu Ijiro, RIES, Hokkaido University)

19:40-19:45: **Opening remarks** (Prof. Chain-Shu Hsu, CEFMS, National Yang-Ming Chiao Tung University)

19:45 – 22:00: **Poster session and free discussion**

Day 2 (8 December 2023)

Session 2

Chair: Prof. Yaw-Kuen Li

09:00 – 09:25: **Invited lecture 1**

Lead-Free Perovskite Solar Cells

Prof. Eric Diau (CEFMS, National Yang-Ming Chiao Tung University)

09:25 – 09:50: **Invited lecture 2**

Metal Oxide Nanowire Array as a Powerful Probing Tool to Reveal Surface Molecular Behaviors of Volatile Organic Compounds

Prof. Kazuki Nagashima (RIES, Hokkaido University)

09:50 – 10:15: **Invited lecture 3**

Biomimetic Affinity Sensor for the Ultrasensitive Detection of Pesticides

Prof. Pei-Kuen Wei (RCAS, Academia Sinica)

10:15 – 10:40: **Invited lecture 4**

Wafer-Scale Growth of Single-Crystal 2D Semiconductors for Practical Applications

Prof. Wen-Hao Chang (CEFMS, National Yang-Ming Chiao Tung University)

10:40~10:55: **Break**

Session 3

Chair: Prof. Kenji Hirai

10:55 – 11:20: **Invited lecture 5**

Excitons in Halide Perovskite Assemblies

Prof. Takuya Okamoto (RIES, Hokkaido University)

11:20 – 11:45: **Invited lecture 6**

Structural Characterization and Potential Anti-Cancer Applications of Grimontia Hollisae Thermostable Direct Hemolysin

Prof. Tung-Kuen Wu (CEFMS, National Yang-Ming Chiao Tung University)

11:45 – 12:10: **Invited lecture 7**

Fluorescent Sensors Paving the Future of Life Sciences

Prof. Tetsuya Kitaguchi (CLS-IIR, Tokyo Institute of Technology)

12:10~13:15: **Photo session and lunch break**

Session 4

Chair: Prof. Hideyuki Mitomo

13:15 – 13:40: **Invited lecture 8**

High Performances Organic Photovoltaics Over 18% Efficiency Based on Carbazole-Based Non-Fullerene Acceptors

Prof. Chain-Shu Hsu (CEFMS, National Yang-Ming Chiao Tung University)

13:40 – 14:05: **Invited lecture 9**

Orientation Control of Gold Nanorods with Polymer Brushes

Prof. Satoshi Nakamura (RIES, Hokkaido University)

14:05 – 14:10: **Concluding remarks** (Prof. Yaw-Kuen Li, CEFMS, National Yang-Ming Chiao Tung University)

14:15 – 16:00: **Return**

Posters

P01

Synthesis of Benzimidazole-based Non-Fullerene Acceptors for Organic Photovoltaics and Organic Field-Effect Transistors

Ching-Li Huang, Chi-Chun Tseng, Chia-Lin Tsai, Yung-Yung Chang, Yung-Jing Xue, Yen-Ju Cheng (*National Yang-Ming Chiao Tung University*)

P02

Stretchable and Self-Healable Electrospun Fibers via Noncovalent Cross-Linked Functional Polythioureas,

Tse-Yu Lo, Heng-Hsuan Su, Hsun-Hao Hsu, Kai-Jie Chang, Huan-Ru Chen, Jiun-Tai Chen (*National Yang-Ming Chiao Tung University*)

P03

Functional Polymers for Solution-Processed Bioreactive Composites and Selective Control of Cell Activity

Hsiu-Pen Lin Yaw-Kuen Li (*National Yang-Ming Chiao Tung University*)

P04

Defect Engineering of hBN for Single Photon Source

Shih-Chu Lin, Ya-Ching Tsai, Yu-Chen Chen, Wen-Hao Chang (*National Yang-Ming Chiao Tung University*)

P05

Epitaxial Growth of Single Crystal MoS₂ Grown on Mis-Cut Sapphire

Zi-Xiang Jian (*National Yang-Ming Chiao Tung University*)

P06

Pesticides Detection by Integrating Synthetic Peptides and Surface-Enhance Raman Spectroscopy

Thi Anh Hong Tran, Sheng-Hann Wang, Ting-Wei Chang, Pei-Kuen Wei, Shu-Yi Hsieh (*RCAS, Academia Sinica*)

P07

Dielectrophoresis Enhanced Surface Plasmon Resonance Image for Ultrasensitive Bio-chemical Sensing

Sheng-Hann Wang, Shu-Cheng Lo, Thi Anh Hong Tran, Ting-Wei Chang, Shu-Yi Hsieh, Pei-Kuen Wei (*RCAS, Academia Sinica*)

P08

Development of Anaerobic Micro Alimentary Canal Chip (MAC-C) for In Vitro Study of Gut Microbiome Effect Drug Metabolism

Tzu-Tung Li, Hsiu-Pen Lin, Hsin-Yu Chen, Chi-Hsuan Chen, Bor-Ran Li (*National Yang-Ming Chiao Tung University*)

P09

Integration of Microfluidic Cell Sorting and Automated Image Analysis Techniques for Establishing a Rapid Circulating Tumor Cells Screening
Ya-Yun Pai, Chia-Jen Lee, Yi-Tzu Chiu, Yi-Chieh Lin, Ping-Hsien Tsou, Bor-Ran Li (National Yang-Ming Chiao Tung University)

P10

Plasmonic Manipulated Chiral Crystallization of Organic Compound
An-Chieh Cheng, Christophe Pin, Teruki Sugiyama, Keiji Sasaki (Hokkaido University and National Yang-Ming Chiao Tung University)

P11

Development of DUV Reflective Objective with NA 1.30 for High-Resolution Raman Microscope
Hikaru Takehara, Keiji Sasaki, Atsushi Taguchi (Hokkaido University)

P12

Spatially Heterogeneous Dynamics of Phase-Separated Droplets Formed by Arginine-Rich Dipeptides and Poly-A RNA
Tian Ya, Hirshi Ujii (Hokkaido University)

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Length Controllable Silver Nanowire Probe for High TERS Activity
Li Jiangtao, Hiroshi Ujii (Hokkaido University)

P14

Monitoring of Cellular ERK Activity upon Photothermal Stimulation
Kenji Omori, Hiroshi Ujii (Hokkaido University)

P15

Recent Advances in Femtosecond X-ray Laser Imaging with Liquid Cells
Akihiro Suzuki, Yoshiya Niida, Kaori Koya, Shunpei Nozaki, Yusuke Ikuta, Yoshitaka Bessho, Yasumasa Joti, Yoshinori Nishino (Hokkaido University, University of Tokyo, JASRI)

P16

Improving the Fabrication Yield of Silicon-Based Liquid Cells for X-ray Laser Imaging
Yoshiya Niida, Akihiro Suzuki, Yoshinori Nishino (Hokkaido University)

P17

High-Density Liquid Cell Arrays by Deep Reactive Ion Etching for Efficient X-ray Laser Imaging
Shunpei Nozaki, Yoshiya Niida, Akihiro Suzuki, Yoshinori Nishino (Hokkaido University)

P18

Structural Analysis of Fuel Cell Catalyst Ink by 100-nm Focused X-ray Free-Electron Laser

Yusuke Ikuta, Yoshiya Niida, Akihiro Suzuki, Yoshinori Nishino (*Hokkaido University*)

P19

Fast Modulation of Optical Vortices for Precise Measurements of Helical Dichroism

Shun Hashiyada, Yoshito Tanaka (*Hokkaido University*)

P20

Blinking Photoluminescence of Narrow Bandgap Halide Perovskites

Tianci Wang, Duan Li, Takuya Okamoto, Vasudevanpillai Biju (*Hokkaido University*)

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Dual Photoluminescence of Copper Halide Single Crystals

Rahul Ghosh Dastidar, Takuya Okamoto, Kiyonori Takahashi, Yuta Takano, Ch. Subrahmanyam, Vasudevanpillai Biju (*Hokkaido University and Indian Institute of Technology Hyderabad*)

P22

Phenylazothiazoles pH Indicators

P. K. Hashim, Shifa Ahmed, Nusaiba Madappuram Cheruthu, Nobuyuki Tamaoki (*Hokkaido University*)

P23

Developing Visible-Light Activatable Drugs by Caging Bioactive Imidazoles

Ammathnadu S. Amrutha, Jiajun Qi, Nobuyuki Tamaoki (*Hokkaido University*)

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Photoresponsive-Auxin Induced Degron (PAID) Technology for Spatiotemporal Control of Intracellular Protein Level

Saugata Sahu, Koya Yoshizawa, Ryota Uehara, Nobuyuki Tamaoki (*Hokkaido University*)

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Phenylazothiazoles as Visible-Light Photoswitches

Runze Lin, P. K. Hashim, Saugata Sahu, Ammathnadu S. Amrutha, Nusaiba Madappuram Cheruthu, Shakkeeb Thazhathethil, Kiyonori Takahashi, Takayoshi Nakamura, Takashi Kikukawa, Nobuyuki Tamaoki (*Hokkaido University*)

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Caging Bioactive Imidazoles: A Photopharmacological Approach to Achieve Spatiotemporal Regulation on Drug Action

Jiajun Qi, Ammathnadu S. Amrutha, Sumire Ishida Ishihara, Ryota Uehara, Nobuyuki Tamaoki (*Hokkaido University*)

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Development of Visible-Light Active "Heteroaryl Azo" Photoswitches for Photopharmacology Applications

Madappuram Cheruthu Nusaiba, P. K. Hashim, Nobuyuki Tamaoki (*Hokkaido University*)

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Handy Clean Unit System Platforms (CUSPs)

H. Wu, T. Hsieh, S. Liang, D. Wu, Z. Zhou, A. Ishibashi (*Hokkaido University*)

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Solar Cells with Cylindrical Waveguides

D. Wu, Y. Wang, X. Hong, H. Wu, A. Ishibashi (*Hokkaido University*)

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Novel Synthetic Approach for ZnO High-Order Nanostructure by Competition of Crystal Growth and Chemical Etching

Yuta Kazama, Ryunosuke Matsumura, Narathon Khemasiri, Kazuki Nagashima (*Hokkaido University*)

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Ionic Layer Epitaxy of Monolayered Zinc Oxide Nanosheet

Ryunosuke Matsumura, Yuta Kazama, Narathon Khemasiri, Kazuki Nagashima (*Hokkaido University*)

P32

Probing the Biogenesis of Polysaccharide Granules in Algal Cells via Raman Microscopy with Stable Isotope Labeling

Yusuke Yonamine, Yasuyuki Ozeki, Yu Hoshino, Hideyuki Mitomo, Kuniharu Ijiri (*Hokkaido University, The University of Tokyo, Kyushu University*)

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Self-Assembly and Dynamic Array Control of Liquid-Crystalline Dendron-Modified Fe₃O₄ Nanoparticles

Takehiro Yachi, Masaki Matsubara, Xiangbing Zeng, Goran Ungar, Atsushi Muramatsu, Kiyoshi Kanie (*Hokkaido University, Tohoku University, NIT Sendai College, Xi'an Jiaotong University, The Sheffield University*)

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High-Speed Volumetric Fluorescence Microscopy for Observing Dynamics of Life

Hideharu Mikami (*Hokkaido University*)

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Proposal of an Ultra-Large Field-of-View Objective Lens by Wavefront Compensation Towards Mouse Brain Cortex-Wide Imaging
Atsushi Shibukawa, Hyojeong Shon, Hideharu Mikami (Hokkaido University)

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Opto-Acoustic Technology for Bioimaging
Ayumu Ishijima, Hideharu Mikami (Hokkaido University)

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Flexible BaTiO₃ Epitaxial Films with Bulk-like Ferroelectricity and Piezoelectricity
Lizhikun Gong, Atsushi Taguchi, Hiromichi Ohta, Tsukasa Katayama (Hokkaido University)

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Solid-State Electrochemical Thermal Transistors with Perovskite Cobalt Oxide-based Solid Solutions as the Active Layers
Zhiping Bian, Mitsuki Yoshimura, Qian Yang, Hai Jun Cho, Joonhyuk Lee, Hyoungjeen Jeon, Takashi Endo, Yasutaka Matsuo, Hiromichi Ohta (Hokkaido University, Jiangsu University, Pusan National University)

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Fabrication and Thermoelectric Properties of Freestanding Ba_{1/3}CoO₂ Single Crystalline Films
Kungwan Kang, Fumiaki Kato, Akitoshi Nakano, Ichiro Terasaki, Takashi Endo, Yasutaka Matsuo, Hyoungjeon Jeon, Hiromichi Ohta (Hokkaido University, Nagoya University, Pusan National University)

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Magnetic Phase Transition Induced Modulation of Ferroelectric Properties in Hexagonal RFeO₃ (R = Tb, Ho) System
Y. Liu, B. Chen, Y. Hamasaki, H. Ohta, T. Katayama (Hokkaido University, National Defense Academy)

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Thermal Conductivity of RNiO₃ (R = La, Nd, Pr, and Sm) Epitaxial Films
Mitsuki Yoshimura, Zhiping Bian, Ahrong Jeong, Hiromichi Ohta (Hokkaido University)

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Developing Photoelectrodes under Modal Strong Coupling Conditions for Solar Energy Conversion
Xu Shi, Yasutaka Matsuo (Hokkaido University)

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Precise Nanostructure Fabrication to Enhance Soft Laser Desorption/Ionization

Ryota Saito, Hiroshi Furutani, Junichi Osuga, Michisato Toyoda, Yasutaka Matsuo (*Hokkaido University*)

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Crystal-to-Crystal Structural Transformation of (Na)([2.2.2]cryptand)[Ni(dmit)₂] Associated with Selective CH₃CN Adsorption
Kiyonori Takahashi, Rui-Kang Huang, Jiabing Wu, Chen Xue, Takayoshi Nakamura (*Hokkaido University*)

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Towards Molecular Multiferroics by Supramolecular Rotor and Ferromagnetic [MnCr(oxalate)₃]-Salts
Rui-Kang Huang, Jiabing Wu, Kiyonori Takahashi, Takayoshi Nakamura (*Hokkaido University*)

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A Ferromagnetic Gyroid Network Formed by Achiral Supramolecule
Jiabing Wu, Kiyonori Takahashi, Rui-Kang Huang, Chen Xue, Takayoshi Nakamura (*Hokkaido University*)

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Relaxor-Like Dielectric Response of 2,2'-Dithiobis(Ethylammonium) / Crown Ether Derivatives Supramolecular Cations in [Ni(dmit)₂] - Salts
Masato Haneda, Kiyonori Takahashi, Rui-Kang Huang, Jiabing Wu, Chen Xue, Takayoshi Nakamura (*Hokkaido University*)

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Magnetism, Negative Thermal Expansion, and Structural Transformation of [Ni(dmit)₂] Salts with Branched-Chain Alkylammonium/Dibenzo[18]Crown-6
Kazuya Kanamaru, Kiyonori Takahashi, Rui-Kang Huang, Jiabing Wu, Chen Xue, Takayoshi Nakamura (*Hokkaido University*)

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Limit Cycle Oscillation of Chemically Driven Elastic Sheets
Yasuaki Kobayashi, Akinori Yoshimoto (*Hokkaido University*)

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9 Compartment Mathematical Model and Its Parameter Estimation for Glucose-Insulin Dynamics
Junyong Eom, Yueyuan Gao, Hiroshi Suito, Hideki Katagiri, Masaharu Nagayama (*Hokkaido University*)

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Mathematical Modeling of Hair Follicle Morphogenesis Mechanism

Keiichiro Kagawa, Makoto Okumura, Yasuaki Kobayashi, Duligengaowa Wuergezhen, Ritsuko Morita, Hironobu Fujiwara, Masaharu Nagayama (*Hokkaido University, Konan University, RIKEN, Osaka University*)

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Sequentially Molecular Properties Prediction using Linear Bandit Algorithm
Md. Menhazul Abedin, Koji Tabata, Yoshihiro Matsumura, Tamiki Komatsuzaki (*Hokkaido University*)

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Inferring Direct and Indirect Interactions among Agents in Collective Motion using Pairwise Information Flow Measure Transfer Entropy
M. Mohiuddin, SulimonSattari, Udoy Basak, Tamiki Komatsuzaki (*Hokkaido University, Pabna University of Science and Technology, Comilla University*)

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Accelerating Atom Mapping with an Ising Machine
Mohammad Ali, Yuta Mizuno, Tamiki Komatsuzaki (*Hokkaido University*)

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Risk - Averse Bandits using Higher Order Moments
Shunta Nonaga, Koji Tabata, Tamiki Komatsuzaki (*Hokkaido University*)

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Microbes-Machine Coupling: A Feedback Loop for Ethology and Proto Intelligences Study
Charles Fosseprez, Yukinori Nishigami, Katsuhiko Sato, Toshiyuki Nakagaki (*Hokkaido University*)

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Diversity of Protists in Lakes and Marshes on Hokkaido University
Atsushi Taniguchi, Yukinori Nishigami (*Hokkaido University*)

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Selecting of Anchoring Location by Geometrical Cues in the Unicellular Organism
Syun Echigoya, Katsuhiko Sato, Osamu Kishida, Toshiyuki Nakagaki, Yukinori Nishigami (*Hokkaido University*)

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Analysis of Flow Network in a Whole Body of Physarum Polycepharum
Yo Sato, Charles Fosseprez, Yukinori Nishigami, Katsuhiko Sato, Hiroshi Orihara, Toshiyuki Nakagaki (*Hokkaido University*)

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*Unique Pattern Dynamics of Nonlocally and Repulsively Coupled Oscillators
as a Model for Amoeboid Movement*

Sota Takahashi, Toshiyuki Nakagaki, Yukinori Nishigami, Yoshiki Kuramoto,
Katsuhiko Sato (*Hokkaido University*)



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