

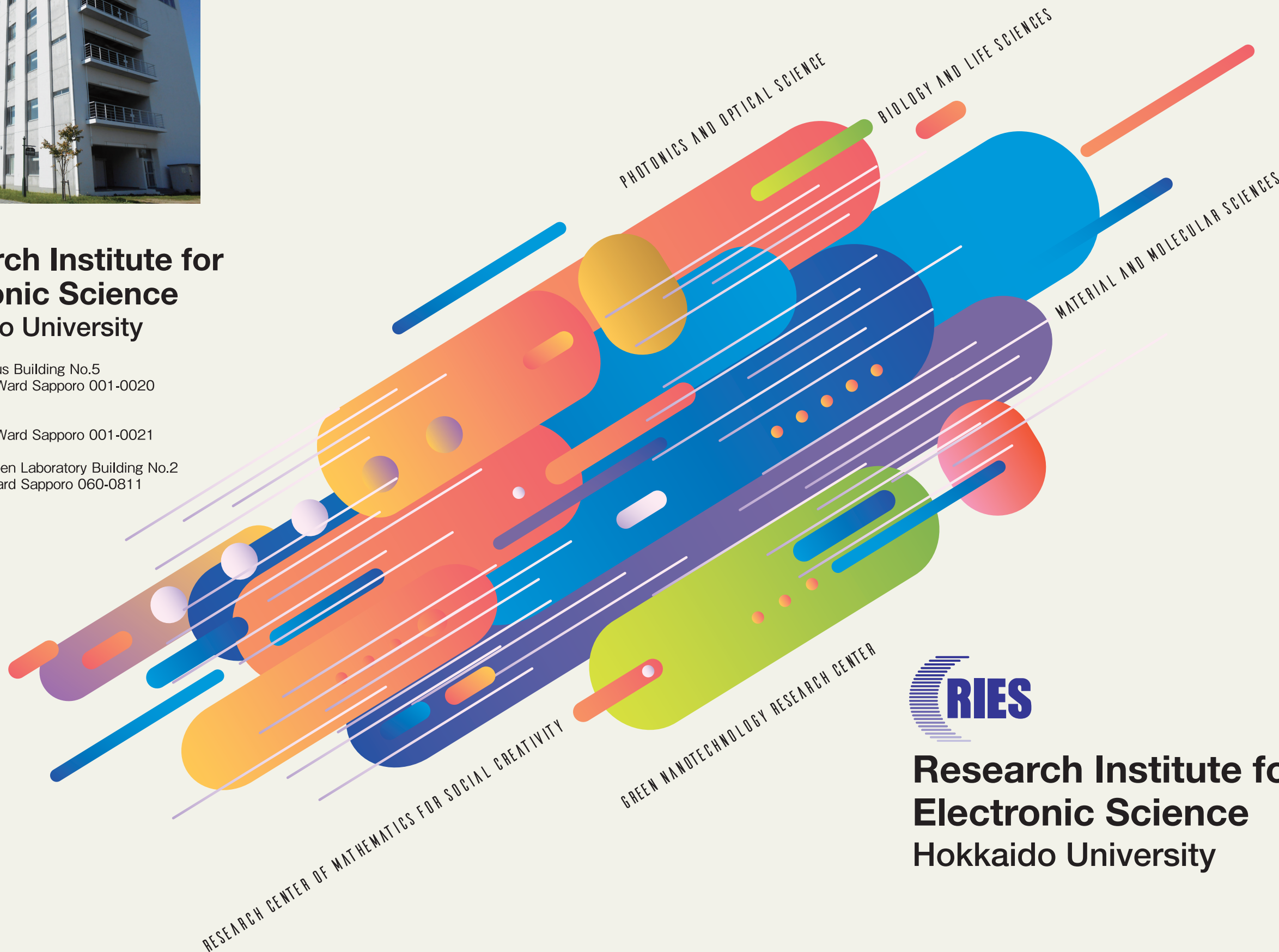


Research Institute for Electronic Science Hokkaido University

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Sousei Building
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**Research Institute for
Electronic Science
Hokkaido University**

About us

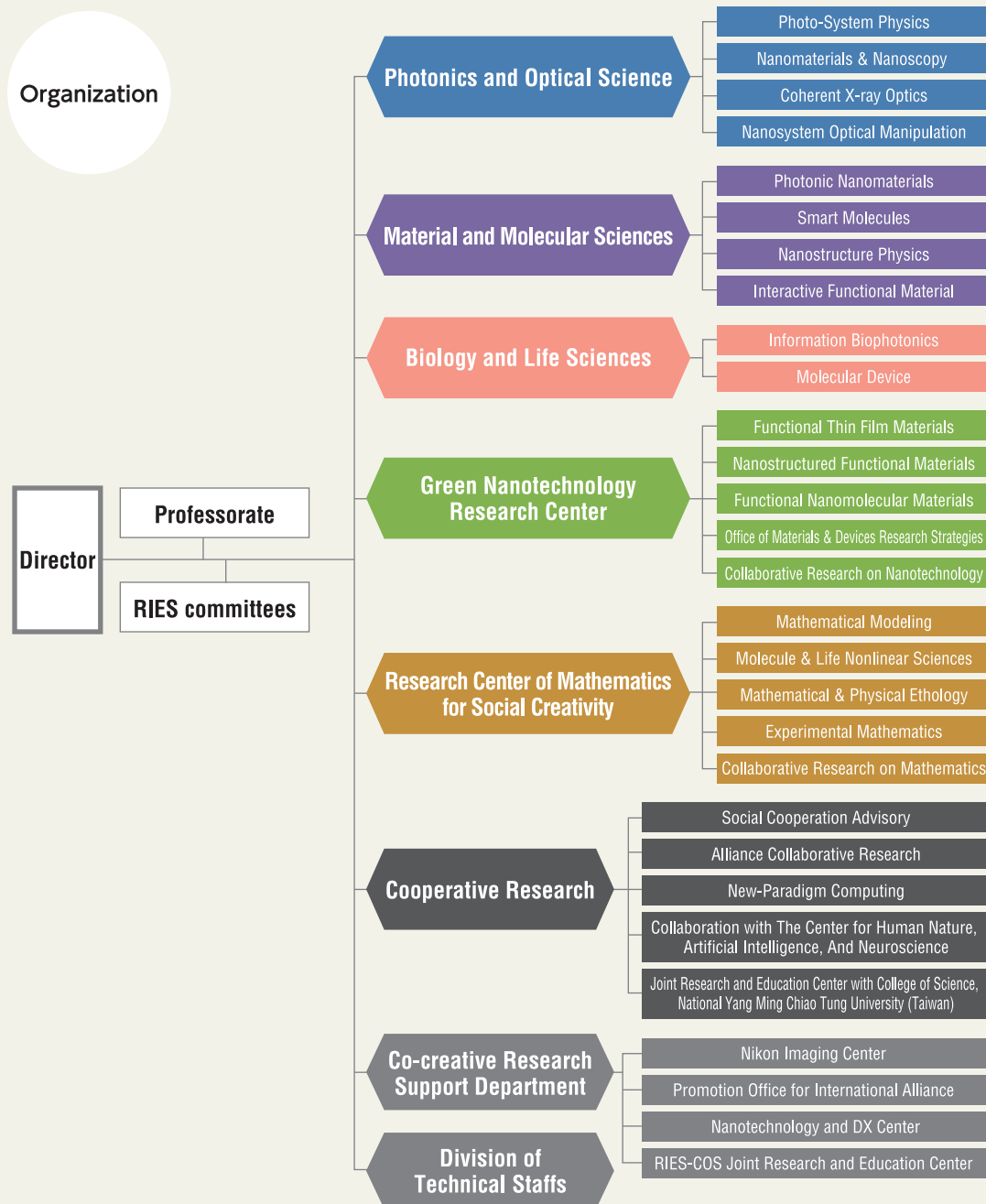
Cooperating 5 sections explore interdisciplinary fields

The Research Institute for Electronic Science has engaged in the history of more than 20 years, with the mission to explore new interdisciplinary fields. Moreover, from the former ultra-shortwave laboratory, more than 70 years have passed since the organization was established.

In 2015, we implemented a reorganizational in all

areas and set five sections; "Optical Science", "Material Science", "Life Science", "Department of Green Nanotechnology Research Center", and "Research Center of Mathematics for Social Creativity". We are working on the mission in full force with our five-pillar structure.

Organization



Section of Material and Molecular Sciences

LABORATORY OF PHOTO-SYSTEM PHYSICS

PI: Prof. Keiji SASAKI, PhD; Assoc. Prof. Atsushi TAGUCHI, PhD;
Assist. Prof. Christophe PIN, PhD; An-Chieh CHENG, PhD

Outline

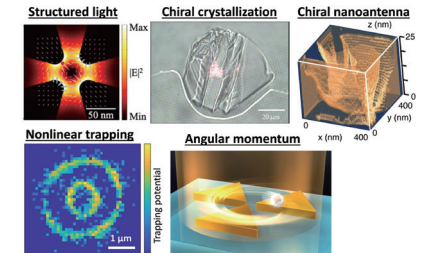
Understanding the unique characteristics of light and how it interacts with matter is of prime importance to develop new applications for optical observation and measurements, optical manipulation, and laser-assisted fabrication. Our goal is to unveil and understand the underlying physics of light-matter interactions by investigating cutting-edge photonic systems and related scientific fields including nano-optics, quantum optics, and photochemistry.

Research highlights

- Nano-shaping of chiral photons, *Nanophotonics*, 2023, **12**, 2499–2506.
- Controlled optical manipulation and sorting of nanomaterials enabled by photonic and plasmonic nanodevices, *J. Photochem. Photobiol. C*, 2022, **52**, 100534.
- Optical selection and sorting of nanoparticles according to quantum mechanical properties, *Sci. Adv.*, 2021, **7**, eabd9551.

Education

Graduate School of Information Science and Technology, Division of Information Science and Technology, Course of Electronics for Informatics



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Section of Photonics and Optical Science

LABORATORY OF NANOMATERIALS AND NANOSCOPY

PI: Prof. Hiroshi UJI-I, PhD; Assoc. Prof. Kenji HIRAI, PhD;
Assist. Prof. Farsai TAEMAITREE, PhD

Outline

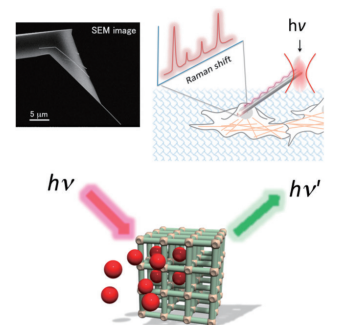
We develop novel nanoscopy based on nanomaterials and nano-photonics. Main research topics are control of chemical reactions via strong/weak coupling, and single-molecule Raman/fluorescence super resolution microscopy/spectroscopy using nanomaterials.

Research highlights

- Length-Controllable Gold-Coated Silver Nanowire Probes for High AFM-TERS Activity, *Nano Lett.*, 2023, **23**, 1615-1621.
- Modulation of Prins Cyclization by Vibrational Strong Coupling, *Angew. Chem. Int. Ed.* 2020, **59**, 5332-5335.
- FRET-based intracellular investigation of nanoprodugs toward highly efficient anticancer drug delivery, *Nanoscale*, 2020, **12**, 16710-16715.

Education

Graduate School of Information Science and Technology, Division of Information Science and Technology, Course of Bioengineering and Bioinformatics



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LABORATORY OF COHERENT X-RAY OPTICS

PI: Prof. Yoshinori NISHINO, PhD;
Assoc. Prof. Akihiro SUZUKI, PhD

Outline

Using the state-of-the-art high-quality and high-intensity X-rays, *e.g.*, X-ray free-electron lasers and synchrotron radiation, we are developing microscopic techniques to observe phenomena that no one has ever seen before, aiming at elucidating biological functions, reducing global environmental problems, and so on. In the research, we also utilize supercomputers and cutting-edge nanofabrication techniques.

Research highlights

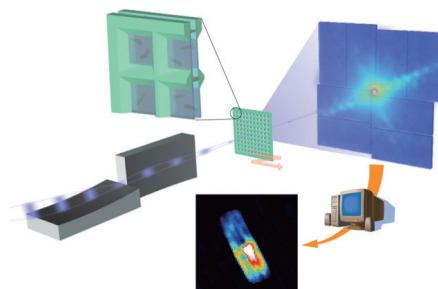
- Femtosecond X-ray laser reveals intact sea-island structures of metastable solid-state electrolytes for batteries, *Nano. Lett.*, 2022, **11**, 4603-4607.
- Three-dimensional structure determination of gold nanotriangles in solution using X-ray free-electron laser single-particle analysis, *Optica*, 2022, **9**, 776-784.
- Imaging live cell in micro-liquid enclosure by X-ray laser diffraction, *Nat. Commun.*, 2014, **5**, 3052.

Education

Graduate School of Information Science and Technology, Course of Bioengineering and Bioinformatics

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yoshinori.nishino@es.hokudai.ac.jp
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LABORATORY OF NANOSYSTEM OPTICAL MANIPULATION

PI: Prof. Yoshito TANAKA, PhD;
Assist. Prof. Shun HASHIYADA, PhD

Outline

We study the interactions of light with precisely designed artificial nanostructures, including plasmonic nanostructures, photonic crystals, metamaterials, and metasurfaces, from a viewpoint of optical momentum and angular momentum. Our goal is to create novel all-optical nanomanipulation and nanoactuators, by understanding and controlling these interactions, that will revolutionize a wide range of science and technology, from future medicine in nanosurgery, drug delivery, and healthcare to quantum mechanics and astronomy.

Research highlights

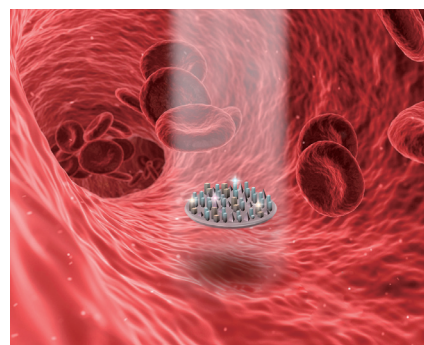
- Plasmonic linear nanomotor using lateral optical forces, *Science Advances* 2020, **6**, eabc3726.
- Tridirectional polarization routing of light by a single triangular plasmonic nanoparticle, *Nano Letters*, 2017, **17**, 3165-3170.
- Radially Polarized Second-Harmonic Generation from a Single-Element Nanoantenna via Dark Plasmon Coupling of Nonlinear Polarization, *ACS Photonics*, 2022, **9**, 3649-3655.

Education

Graduate School of Information Science and Technology, Division of Information Science and Technology, Course of Bioengineering and Bioinformatics

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LABORATORY OF PHOTONIC NANOMATERIAL

PI: Prof. Vasudevan Pillai BIJU, PhD; Assoc. Prof. Yuta TAKANO, PhD;
Assist. Prof. Takuya OKAMOTO, PhD

Outline

Our research focuses on developing cutting-edge semiconductor nanomaterials and organic molecular tool boxes for next generation nanophotonics and biophotonics. Our main research interests are in light-matter-life interactions encompassing optically active functional nanomaterials, photofunctional molecules, and living cells.

Research highlights

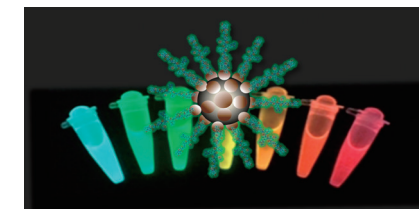
- Mechano-optical Modulation of Excitons and Carrier Recombination in Self-Assembled Halide Perovskite Quantum Dots, *ACS Nano*, 2022, **16**, 160-168.
- Multimodal CTC detection using stem cell antigen-specific immunosilica particles and immunofluorescent quantum dots, *NPG Asia Mater.* 2022, **14**, 1-8.
- Shape-Dependent Kinetics of Halide Vacancy Filling in Organolead Halide Perovskites, *Adv. Opt. Mater.* 2021, **9**, 2170078.

Education

Faculty of Env. Earth Science, Course in Molecular Photonics and Electronics Science

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LABORATORY OF SMART MOLECULES

PI: Prof. Nobuyuki TAMAOKI, PhD; Assist. Prof. P. K. HASHIM, PhD;
Assist. Prof. AMMATHNADU S. Amrutha, PhD

Outline

We explore advanced artificial molecular systems which can sense external stimuli, judge and execute informative functions. Main research topic includes light-driven molecular machines: photoresponsive energy molecules and inhibitors for control of motor proteins, and photo-regulation of chiral liquid crystals for optical and mechanical functions.

Research highlights

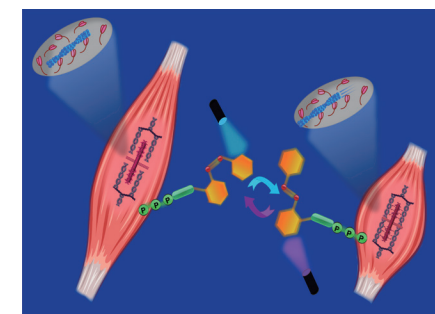
- Phenylazothiazoles as Visible-Light Photoswitches, *J. Am. Chem. Soc.*, 2023, **145**, 9072-9080.
- Dynamic Control of Microbial Movement by Photoswitchable ATP Antagonists, *Chem. Eur. J.*, 2022, **28**, e202200807.

Education

Graduate School of Life Science, Transdisciplinary Life Science Course

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LABORATORY OF NANOSTRUCTURE PHYSICS

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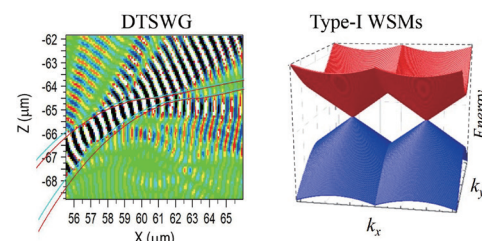


PI: Prof. Akira ISHIBASHI, PhD; Assoc. Prof. Kenji KONDO, PhD

Outline

We explore advanced electronic devices and systems considering Atom•Bit•Energy/Environment (ABE²) space.

Main research topics are high efficiency solar cells, highly clean systems, theory of novel spintronics devices, theory of topological matters, and advanced clean systems.



Research highlights

- Designing coupling of 2-Dimensional PhotoRecepto-Conversion Scheme (2DPRCS) with Clean Unit System Platform (CUSP), *Energies*, 2023, **16**(4): 1838-1-1838-13.
- Cylindrical Waveguides and Multi-Junction Solar Cell Investigated for Two-Dimensional PhotoRecepto-Conversion Scheme, *Photonics*, 2023, **10**(3): 299-1-299-12.
- General formula of chiral anomaly for type-I and type-II Weyl semimetals, *Appl. Phys. Lett.*, 2021, **119** 131907-1-131907-6.

Education

Faculty of Sci. Dept. of Condensed Matter Physics

LABORATORY OF INTERACTIVE FUNCTIONAL MATERIAL

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PI: Prof. Kazuki NAGASHIMA, PhD;
 Assoc. Prof. Narathon KEMASHIRI, PhD

Outline

Chemical information from molecules has extraordinary amount of information beyond physical information, and its effective use is expected towards the next-generation information society. Our lab aims to develop a novel platform of "interactive electronics" for collecting chemical information of molecules by designing robust molecular recognition materials/devices at atomic/molecular scale. We pursue fusion science over materials, devices and data, and take on the challenge of creating new value through chemical information.



Research highlights

- Breath odor-based individual authentication by an artificial olfactory sensor system and machine learning, *Chemical Communications* 2022, **58**, 6377.
- Water-Selective Nanostructured Dehumidifiers for Molecular Sensing Spaces, *ACS Sensors*, 2022, **7**, 151.
- The impact of surface Cu²⁺ of ZnO/(Cu_{1-x}Zn_x)O heterostructured nanowires on the adsorption and chemical transformation of carbonyl compounds, *Chemical Science*, 2021, **12**, 5073.

Education

Graduate School of Chemical Sciences and Engineering, Materials Chemistry and Engineering Course

LABORATORY OF MOLECULAR DEVICE

【E-mail / Web page】

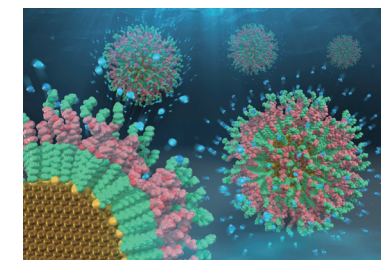
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PI: Prof. Kuniharu IJIRO, PhD; Assoc. Prof. Hideyuki MITOMO, PhD; Yuzuru SATO, PhD;
 Assist. Prof. Yusuke YONAMINE, PhD; Specially Appointed Assist. Prof. Satoshi NAKAMURA, PhD

Outline

Biomolecules autonomously assemble and show higher functionalities in the cell. By learning the nature system, our group is working on development of nanoparticle assemblies with controlled structures via self-assembly focusing on the surface properties derived from ligand coating and shape of the nanoparticles. As the gold nanoparticles show unique properties related to electronic, optical and biomedical applications, their assemblies are expected to be novel functional materials.



Research highlights

- Core-Gap-Shell Nanoparticles@Polyaniline with Tunable Plasmonic Chiroptical Activities by pH and Electric Potential Dual Modulation, *Chemistry of Materials*, 2022, **34**, 4062-4072.
- Molecular configuration-mediated thermo-responsiveness in oligo(ethylene glycol) derivatives attached on gold nanoparticles, *Nanoscale Advances*, 2021, **3**, 3762-3769.
- Reversible Changes in the Orientation of Gold Nanorod Arrays on Polymer Brushes, *Nanoscale Advances*, 2020, **2**, 3798-3803.

Education

Graduate School of Life Science, Division of Soft Matter

LABORATORY OF INFORMATION BIOPHOTONICS

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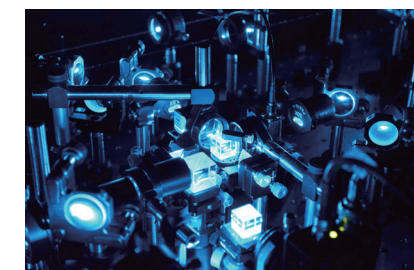
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PI: Prof. Hideharu MIKAMI, PhD; Assoc. Prof. Atsushi SHIBUKAWA, PhD;
 Assist. Prof. Ayumu ISHIJIMA, PhD

Outline

The goal of our research is to bring revolutionary progress to life science through the creation of cutting-edge optical and information technologies. We will create new technologies that integrate photonics and information technology to provide unconventional measurement and experimental methods, thereby creating new developments in life science. Furthermore, we aim to give back to society through the practical application and commercialization of our research results. Through our research activities, we will create a new trend that spans academia and industry.



Research highlights

- Virtual-freezing fluorescence imaging flow cytometry, *Nature Communications*, 2020, **11**, 1162.
- Intelligent image-activated cell sorting, *Cell*, 2018, **175**, 266-276.e13.
- Wavefront engineering with disorder-engineered metasurfaces, *Nature Photonics*, 2018, **12**, 84-90.

Education

Graduate School of Information Science and Technology, Division of Information Science and Technology, Course of Bioengineering and Bioinformatics

LABORATORY OF FUNCTIONAL THIN FILM MATERIALS

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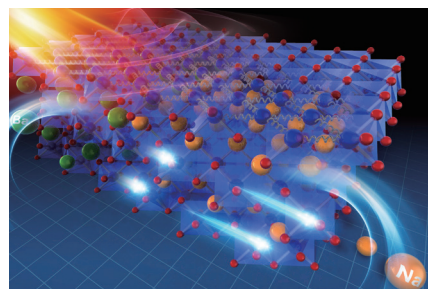
https://functfilm.es.hokudai.ac.jp/english/



PI: Prof. Hiromichi OHTA, PhD; Assoc. Prof. Tsukasa KATAYAMA, PhD;
Assist. Prof. Yusaku MAGARI, PhD

Outline

We fabricate high-quality thin film materials with the atomically flat surface to extract the intrinsic performance and develop novel devices. Especially, we develop thermoelectric materials, which can convert heat into electricity, and novel materials for advanced device applications.



Research highlights

- Solid-State Electrochemical Thermal Transistors, *Adv. Funct. Mater.*, 2023, **33**, 2214939.
- Significant Suppression of Cracks in Freestanding Perovskite Oxide Flexible Sheets Using a Capping Oxide Layer, *ACS Nano*, 2022, **16**, 21013.
- Thermopower Modulation Analyses of High-mobility Transparent Amorphous Oxide Semiconductor Thin-Film Transistors, *ACS Appl. Electron. Mater.*, 2022, **4**, 5081.

Education

Graduate School of Information Science and Technology, Division of Electronics for Informatics

LABORATORY OF NANOSTRUCTURED FUNCTIONAL MATERIALS

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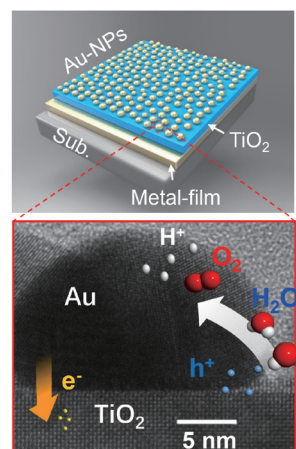
http://nanostructure.es.hokudai.ac.jp/



PI: Prof. Yasutaka MATSUO, PhD; Assoc. Prof. Xu SHI, PhD

Outline

We are focusing on the nano- to micrometer-scale structures fabricated on the surfaces of materials and at interfaces between different materials, which induce unique physical and chemical phenomena. In particular, we create biomimetic surfaces based on various surface structures of living organisms and metal/semiconductor nanostructures, and aim to develop novel devices for controlling light, heat, and electrons.



Water splitting surface

Research highlights

- Aqueous dispersion and tuning surface charges of polytetrafluoroethylene particles by bioinspired polydopamine–polyethyleneimine coating via one-step method, *R. Soc. Open Sci.* 2021, **8**: 210582.
- A New Concept for an Adhesive Material Inspired by Clingfish Sucker Nanofilaments, *Langmuir*, 2022, **38**, 3, 1215–1222.
- Enhanced water splitting under modal strong coupling conditions, *Nat. Nanotechnol.* 2018, **13**, 953–958.

Education

Graduate School of Chemical Sciences and Engineering, Department of Chemistry, Materials Chemistry and Engineering Course

LABORATORY OF FUNCTIONAL NANO-MOLECULAR MATERIALS

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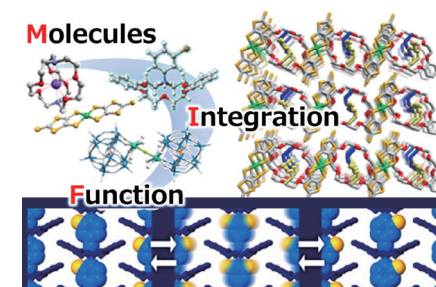
http://fnm.es.hokudai.ac.jp/



PI: Prof. Takayoshi NAKAMURA, PhD; Assist. Prof. Kiyonori TAKAHASHI, PhD;
Rui-Kang HUANG, PhD; Chen XUE, PhD; Jia-bing WU, PhD

Outline

We construct the “Integrated Molecular Systems” through self-assembly processes of molecules, and develop the materials for the molecular devices to future electronics. Our main research interests are the development of molecular conductors and magnetic materials, molecular motors, single-chain ferroelectrics with composite functions from the viewpoint of supramolecular chemistry.



Research highlights

- Multifunctional triggering by Solid-Phase Molecular Motion: Relaxor Ferroelectricity, Modulation of Magnetic Exchange Interactions, and Enhancement of Negative Thermal Expansion, *Chemistry of Materials*, 2023, **35**(6):2421-2428.
- A Proton Conductive Porous Framework of an 18-Crown-6-Ether Derivative Networked by Rigid Hydrogen Bonding Modules, *Angewandte Chemie International Edition*, 2022, **61**(45): e2022116.

Education

Graduate School of Environmental Science, Division of Environmental Materials Science, Course in Molecular Photonics and Electronics Science

LABORATORY OF MATHEMATICAL MODELING

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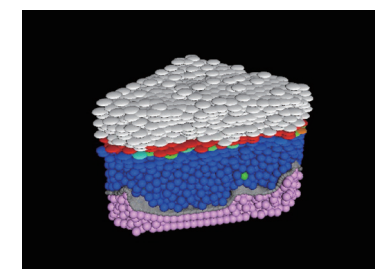


PI: Prof. Masaharu NAGAYAMA, PhD; Assoc. Prof. Yasuaki KOBAYASHI, PhD;
Assist. Prof. Yikan LIU, PhD

Outline

With mathematical modeling, numerical computation, and mathematical analysis forming the foundation of our research, we aim to understand biological and other natural phenomena from the perspective of the mathematical sciences. The main research topics are the following:

- The mathematical analysis of self-propelled motion
- The epidermal structure and skin diseases
- The mathematical modeling of life sciences
- The pattern dynamics of reaction-diffusion systems



Research highlights

- On the reaction-diffusion type modelling of the self-propelled object motion, *Scientific Reports*, 2023, **13**, 12633.
- A computational model of the epidermis with the deformable dermis and its application to skin diseases, *Scientific Reports*, 2021, **11**, 13234.
- Uniqueness of orders and parameters in multi-term time-fractional diffusion equations by short-time behavior, *Inverse Problems*, 2023, **39**, 024003.

Education

Department of Mathematics, Faculty of Science

LABORATORY OF MOLECULAR PHOTONICS

PI: Prof. Tamiki KOMATSUZAKI, PhD; **Assoc. Prof.** Koji TABATA, PhD;
Assist. Prof. Yuta MIZUNO, PhD; Goro NISHIMURA, PhD;
Specially Appointed Assist. Prof. Jean-Emmanuel CLEMENT, PhD;
 Mikhail TSITSVERO, PhD

Outline

The purpose of our laboratory is to understand the fundamental principles of chance and necessity of “change of states”, and to construct new concepts and methodologies in terms of data-driven mathematical sciences, enabling us to unveil the mechanisms that bridge molecules and life across hierarchies in time and space.

Research highlights

- Modes of information flow in collective cohesion, *Science Advances*, 2022, **8**(6), sciadv.abj1720.
- Phase space geometry of isolated to condensed chemical reactions, *J. Chem. Phys.*, 2021, **155**, 210901(17pages).
- A bad arm existence checking problem: How to utilize asymmetric problem structure? *Machine Learning*, 2020, **109**, 327-372.

Education

Graduate School of Chemical Sciences and Engineering Materials Chemistry and Engineering Course;
 Graduate School of Science, Department of Mathematics

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LABORATORY OF MATHEMATICAL AND PHYSICAL ETHOLOGY

PI: Prof. Toshiyuki NAKAGAKI, PhD; **Assoc. Prof.** Katsuhiko SATO, PhD;
Assist. Prof. Yukinori NISHIGAMI, PhD

Outline

Soft matter physics that deals with soft and largely deformable materials is a necessary tool for mechanical understanding of motion, deformation and growth of biological systems such as cells, tissues and organisms. Based on these ideas, we are investigating characteristic and functional behaviors of various biological systems, by inventing unique experimental setup. We focus on unicellular organisms of amoebae and ciliates, and observe how they behave in complicated conditions and propose a mathematical model in terms of soft matter physics. Based on the model simulation and analysis, we seek for algorithm of how they process information and behavioral smartness.

Research highlights

- A cell membrane model that reproduces cortical flow-driven cell migration and collective movement, *Frontiers in Cell and Developmental Biology*, 2023, **11**, 1126819.
- Caenorhabditis elegans transfers across a gap under an electric field as dispersal behavior, *Current Biology*, 2023, **33**, 1-10.
- Light-sheet microscopy reveals dorsoventral asymmetric membrane dynamics of Amoeba proteus during pressure-driven locomotion, *Biology Open*, 2022, **12**, bio059671.

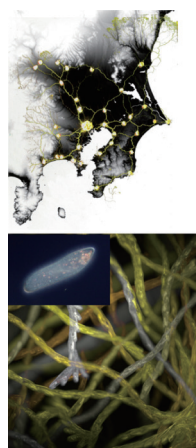
Education

Graduate School of Life Science, Division of Soft Matter

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Laboratory of Social Cooperation Advisory

Guest Prof. Atsushi MURAMATSU
 Guest Prof. Shingo EBATA
 Guest Prof. Yoshio YAMAWAKI
 Guest Prof. Kazuhiro NISHIJIMA

Alliance Collaborative Research Laboratory

Guest Prof. Tomomi NEMOTO

Laboratory of New-Paradigm Computing

Guest Prof. Masanao YAMAOKA
 Guest Prof. Takashi TAKEMOTO
 Guest Prof. Shin-ichi MINATO

Collaboration with the Center for Human Nature, Artificial Intelligence, and Neuroscience

(concurrent position) Assoc. Prof. Hiroyuki IIZUKA,
 (concurrent position) Specially Appointed Assoc. Prof. Masatoshi YOSHIDA
 (concurrent position) Specially Appointed Assoc. Prof. Hideaki SHIMAZAKI
 (concurrent position) Specially Appointed Lecturer Katsunori MIYAHARA

Joint Research and Education Center with College of Science, National Yang Ming Chiao Tung University (Taiwan)

Guest Prof. Yaw-Kuen LI
 Guest Prof. Yuan-Pern LEE
 Guest Prof. Chain-Shu HSU
 Guest Prof. Jiunn-Yuan LIN
 Guest Prof. Jiun-Tai CHEN
 Guest Prof. Yu-Miin SHEU



NIKON IMAGING CENTER

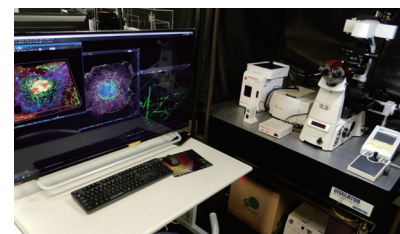
Director: Prof. Hideharu MIKAMI, PhD; Prof. Yasutaka MATSUO, PhD;
Specially Appointed Assist. Prof. Yusuke TOMINA, PhD;
Tech. Staff Kentaro KOBAYASHI, Wakako NAKANO

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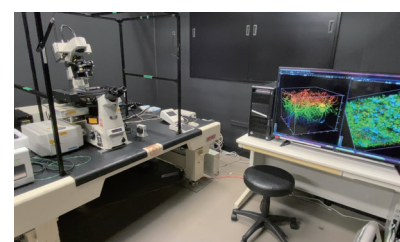


Outline

Nikon Imaging Center provides cutting edge light microscopy instruments to researchers not only in Hokkaido University but also throughout Japan. Our missions are: To enhance scientific research by providing of advanced microscopy and imaging equipment; To provide technical support for high quality imaging; To hold seminars on basic and advanced light microscopy techniques for users; To develop novel microscope systems and imaging techniques reflecting demands of users.



High Speed Confocal Microscope



Multi Photon Microscope

Usage

Usage frequency: 2500 hours, 500 users per year
 Publications by users: 114 papers (2005-2022)

Nanotechnology and DX center

PI: Prof. Yasutaka MATSUO, PhD

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Outline

We support the research and development by nano/ micro fabrication techniques using EB lithography, Atomic Layer Deposition system, Clean Room environment and so on, and advanced characterization of nanomaterials using CsSTEM, FE-SEM, XPS. Technical consultation, equipment training and technical support will be carried out to other universities, public institutions, corporate users. We also actively accept collaborative research.



Research highlights

- Textured Organogel Films Showing Unusual Thermoresponsive Dewetting, Icephobic, and Optical Properties, *Adv. Mater. Interfaces*, 2019, **6**, 1801358
- Low-Friction, Superhydrophobic, and Shape-Memory Vulcanized Rubber Microspiked Structures, *Adv. Eng. Mater.*, 2020, **22**, 1901226

Education

Graduate School of Chemical Sciences and Engineering, Materials Chemistry and Engineering Course Inorganic Materials Chemistry Unit

DIVISION OF TECHNICAL STAFFS

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System/Equipment Development Team

Equipment Development/Machining Group designs, develops, and produces laboratory instruments using various machine tools. We receive orders from all departments on campus and off campus through the Global Facility Center's Prototype Machining Solution Project.

System Development/Data Analysis Group has support for public relations information and network, including system development using IoT technology, operation and maintenance of the Web site of our research institute.

Leader (Coordinator) Masashi TAKEI

■ **Equipment Development/Machining Group:**

Masashi TAKEI (Chief), Mao KUSUZAKI

■ **System Development/Data Analysis Group:**

Michiaki ENDO (Chief), Itsuko IMAMURA, Aya TOGASHI



Nanofabrication/Imaging Analysis Team

Nanofabrication/Imaging Analysis Team has technical support to maintenance and management of clean rooms and common facilities, the Nikon Imaging Center, guidance on use, nano-fabrication and imaging analysis, and also receives technical consultation on them.

Leader (Coordinator); Kentaro KOBAYASHI

■ **Nanofabrication Group:**

Ko ONISHI (Chief)

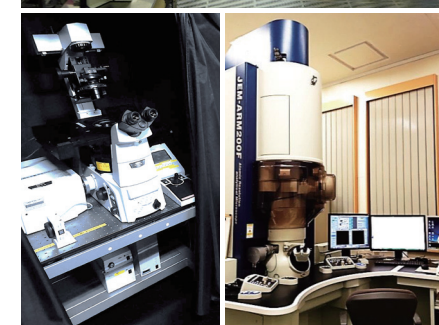
■ **Electronic Microscope Analysis Group:**

Naomi HIRAI (Chief), Yuko MORI

■ **Optical Microscope Analysis Group:**

Kentaro KOBAYASHI (Chief), Wakako NAKANO

* Both teams also provide assistance related to the entire institute, such as institute's events/exhibitions and liquefied nitrogen training sessions.



NETWORK JOINT RESEARCH CENTER FOR MATERIALS and DEVICES

[E-mail / Web page]

NJRC@sanken.osaka-u.ac.jp

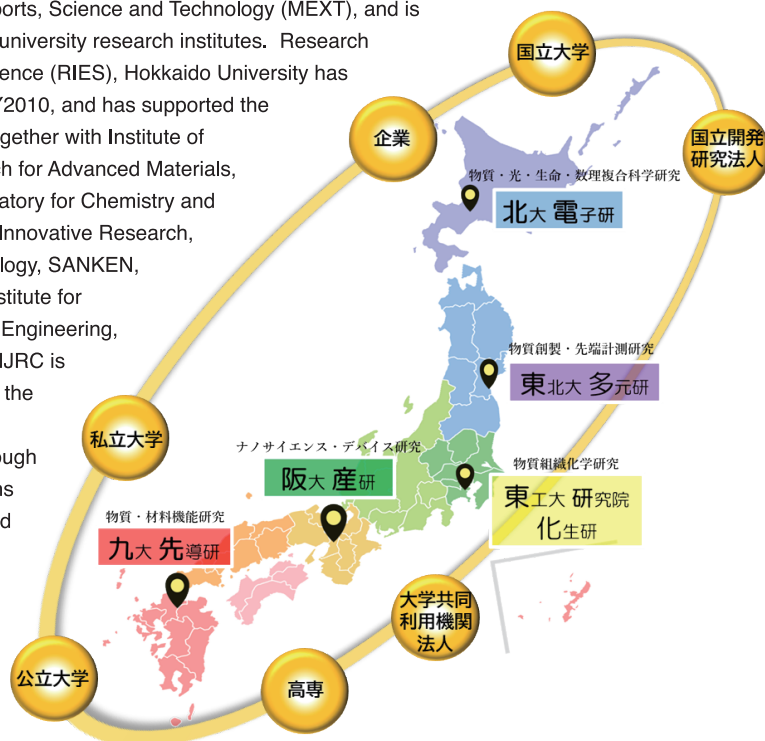
<https://five-star.sanken.osaka-u.ac.jp/>



Subcommittee: Prof. Hiromichi OHTA
Subcommittee: Prof. Yasutaka MATSUO

Introduction

The Network Joint Research Center (NJRC) for Materials and Devices is one of the Joint Usage/Research Centers authorized by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), and is operated across the five university research institutes. Research Institute of Electronic Science (RIES), Hokkaido University has been a member since FY2010, and has supported the activities of the Center together with Institute of Multidisciplinary Research for Advanced Materials, Tohoku University, Laboratory for Chemistry and Life Science, Institute of Innovative Research, Tokyo Institute of Technology, SANKEN, Osaka University, and Institute for Materials Chemistry and Engineering, Kyushu University. The NJRC is expected to contribute to the strengthening of Japan's research capabilities through the creation of innovations centered on materials and devices, the fostering of young human resources, and the promotion of internationalization.



Open call for Proposals

To explore and develop new interdisciplinary areas in materials and devices, the NJRC invites applications once a year from researchers affiliated with national, public, and private universities and public research institutes. The center offers a wide variety of programs, including "Basic Research Program", which is equivalent to budding research, "Crossover Joint Research Program", which is a fusion of different fields, and "Collaborative Research Laboratory Program (CORE-lab)", in which researchers stay at the host institute for a medium- to long-term period of time. Around 500 proposals are adopted each year, and of these, about 90 joint research projects are conducted at RIES.

2023年度
公募案内
申込期間 2023年1月11日(水)~2月2日(木)

**物質・デバイス領域
共同研究拠点**

下記の課題を募集します。

- 基礎共同研究 (前身的研究支援課題)
- 施設・設備利用
- クロスオーバー共同研究 (異分野融合課題)
- 展開共同研究 (産学連携での発展型課題)
- 次世代若手共同研究 (大学院生、学部生、高専生がPIとなる課題)
- COREラボ共同研究 (チーム体制による中長期的課題)

公募の詳細および申請はこちらから
<https://five-star.sanken.osaka-u.ac.jp/>

お問い合わせ：電話・チャット・メール
Tel: 06-6879-4300 E-mail: njrc@sanken.osaka-u.ac.jp

5大学5研究所 拠点ネットワーク

RIES IMRAM IIR-CLS ISIR IMCE

CROSSOVER ALLIANCE

[E-mail / Web page]

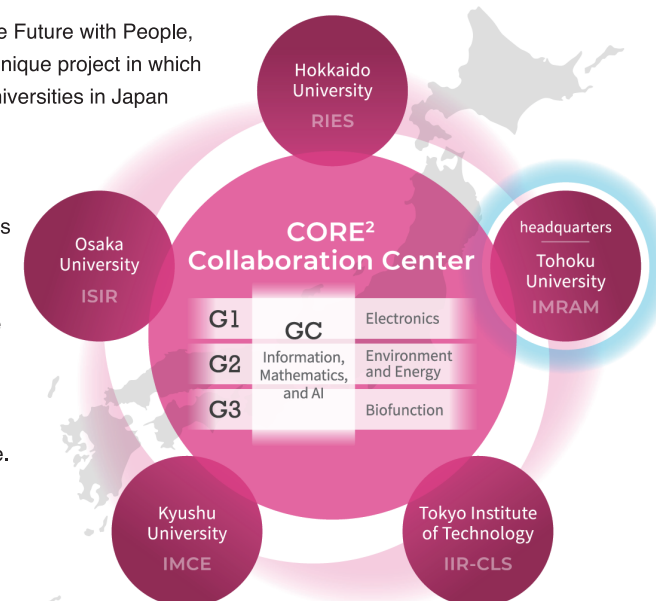
tagen.alliance@grp.tohoku.ac.jp

<https://alliance.tagen.tohoku.ac.jp/english/>



Summary

"Crossover Alliance to Create the Future with People, Intelligence and Materials" is a unique project in which five research institutes of five Universities in Japan form a complementary and cooperative network through mutual collaboration and networking in their scientific fields of expertise. The number of Principal Investigator belonging to the five research institutes is approximately 150 people, and the total number of faculty researchers exceeds 500 people. Four groups have been established and are operated to promote research and development across (crossover) disciplines and laboratories.



RIES : Research Institute for Electronic Science, Hokkaido Univ.

IMRAM : Institute of Multidisciplinary Research for Advanced Materials, Tohoku Univ.

IIR-CLS : Laboratory for Chemistry and Life Science Institute of Innovative Research, Tokyo Institute of Technology

ISIR : Institute of Scientific and Industrial Research, Osaka Univ.

IMCE : Institute for Materials Chemistry and Engineering, Kyushu Univ.

Activity

- **CORE² - A Laboratory**
Cross-institute collaborative research to solve social issues.
- **Young Researchers Feasibility Study Research**
Joint research aimed at fostering young researchers.
- **Support for Technical Departments**
Support for research and revitalization of exchanges between technical offices and technical departments of universities and research institutes
- **Lectures on humanities and social sciences**
Lectures aimed at fusion of different fields, etc.



Please feel free to contact us

Institute of Multidisciplinary Research for Advanced Materials
(IMRAM, or Tagen-Ken in Japanese)
E-mail: tagen.alliance@grp.tohoku.ac.jp

Open Laboratory

Early summer, laboratory open is held every year. Exhibition of research mainly for elementary and junior high school students is famous as a great place to touch advanced science.



International Symposium

International Symposium is held every year by us for discussing common issues beyond national boundaries. Each theme of the year is expressed in one Japanese letter.



Internationality

We enroll many international students in the laboratories, and they research in a global atmosphere.

STUDY with US in RIES

Join state-of-the-art research and create new science

We welcome students from within Japan and abroad.

(i) To be a Master Course or a Ph.D. Course student of Hokkaido University

Please directly contact the research groups that you are interested in.

(ii) To be a research student of RIES and then a graduate student

Please visit the following page to see the details.

<https://www.es.hokudai.ac.jp/english/education/kenkyusei/>



Japanese government offers various scholarships
and education programs to students.

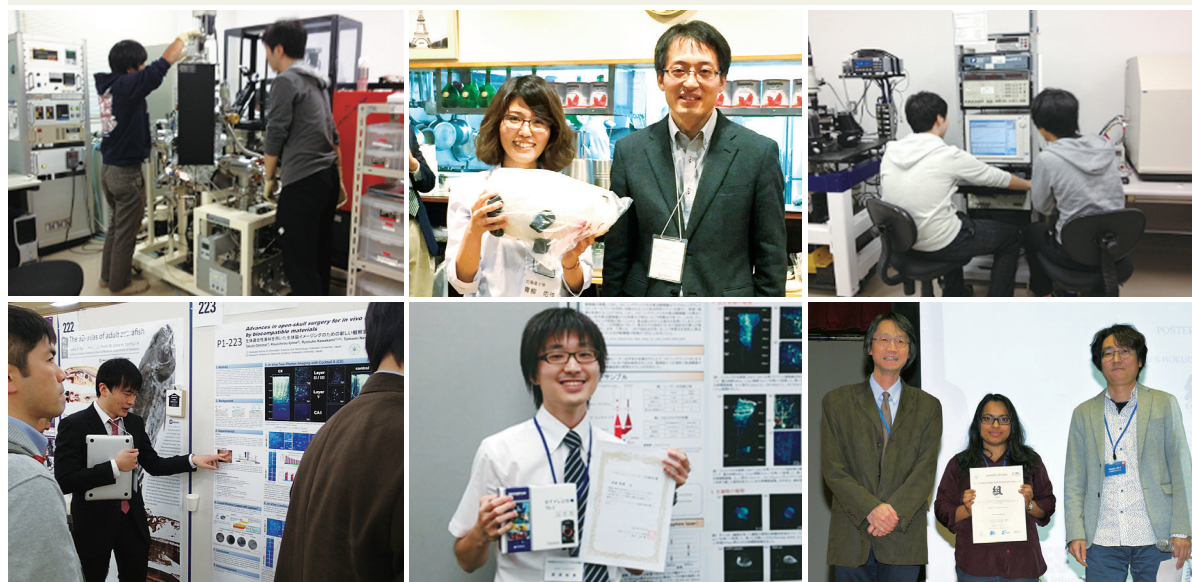
For more details, please visit "Study in Japan" webpage.

<https://www.studyinJapan.go.jp/en/>



For Embassy recommended MEXT Scholarships,
visit the homepage of Japanese embassy in your country,
Gateway to study in Japan, etc.

<https://www.jasso.go.jp/en/index.html>



HOKKAIDO
UNIVERSITY
SAPPORO
CAMPUS



A C C E S S

New Chitose Airport
→ Sapporo Sta.

◎Rapid Airport Train: approx. 40 min.
◎Bus: approx. 70 min.

Sapporo Sta. → RIES

[Northern Campus]

◎Subway Nanboku Line (Get off at Kita 18-jo Station) + Walk: 15 min.
◎Bus (Get off at Kita 21-jo Nishi 15-chome Bus Stop) + Walk: 5 min.
◎Walk: 10 min (To the Main Gate of Hokkaido University)
+ Shuttle Bus (Get off in front of the RIES or the CRIS Building)

[Mid Campus]

◎Walk: 17min
◎Subway Nanboku Line (Get off at Kita 12-jo Station) + Walk: 3 min.