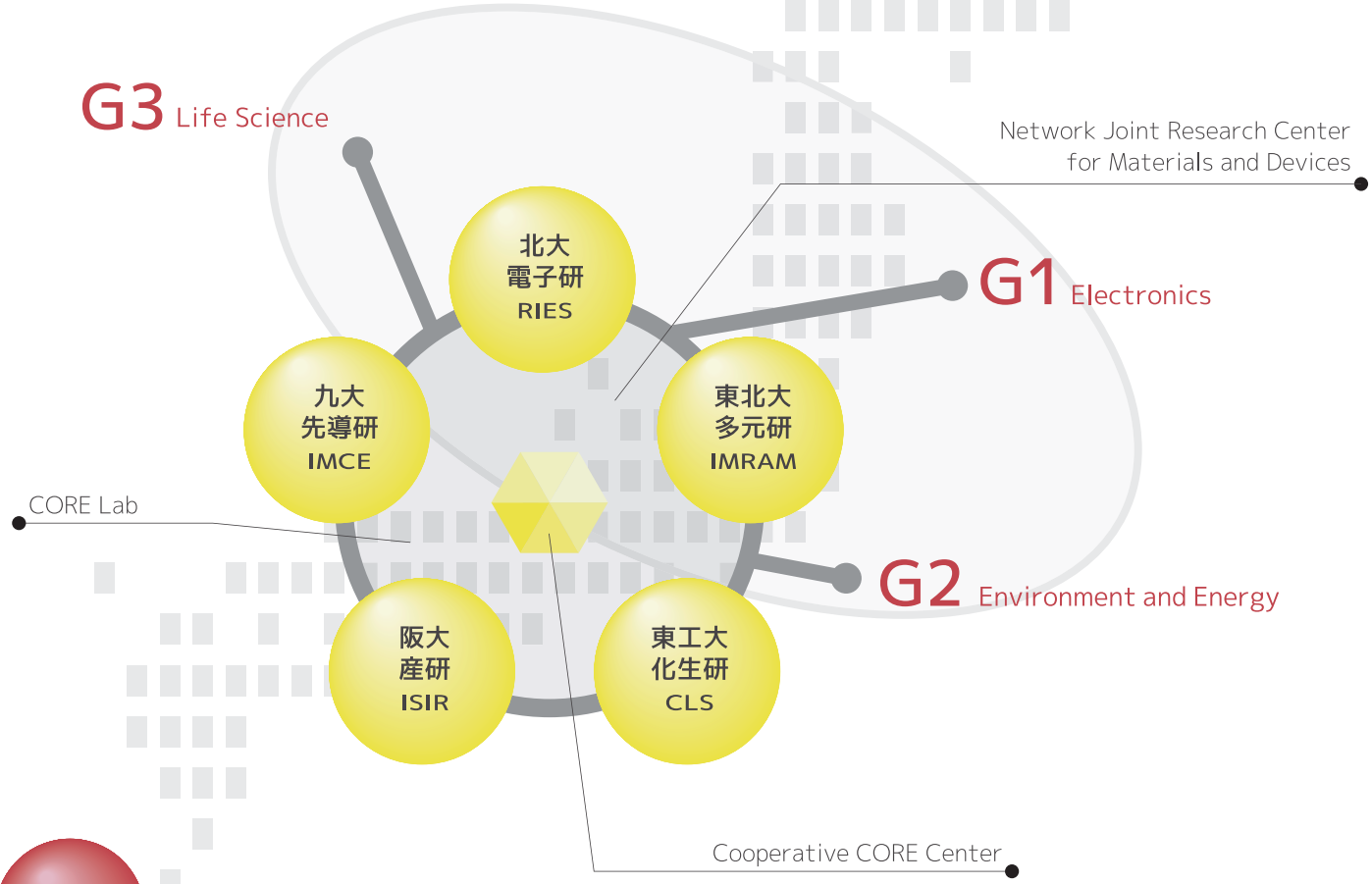


Five-Star

Dynamic Alliance for Open Innovation Bridging Human, Environment and Materials

人・環境と物質をつなぐイノベーション創出ダイナミック・アライアンス

Prospectus

2018

Dynamic Alliance for Open Innovation Bridging Human, Environment and Materials

– Five-star Alliance –

Overview

Based on the former successes of cooperative research projects between two university institutes (FY2005-FY2006) and multi-party alliance projects (Post-Silicon Alliance of FY2007-FY2009, and Nano-Macro Materials, Devices and System Research Alliance of FY2010-FY2015), “Dynamic Alliance for Open Innovation Bridging Human, Environment and Materials”（Five-star Alliance）has been started in fiscal year of 2016 as for the 6 years project to attempt strategic development of next generation “Materials, Devices, and System" for bridging human, environmental and materials as a cooperative research project with five outstanding university institutes including, Research Institute for Electronic Science (RIES) of Hokkaido University, Institute of Multidisciplinary Research for Advanced Materials (IMRAM) of Tohoku University, Laboratory for Chemistry and Life Science (CLS), Institute of Innovative Research (IIR, former Chemical Resources Laboratory) of Tokyo Institute of Technology, the Institute of Scientific and Industrial Research (ISIR) of Osaka University, and Institute for Materials Chemistry and Engineering (IMCE) of Kyushu University.

The “Five-star Alliance” project is aiming to realize true and clearly-targeted academic and industrial “innovation” through the deeper and more effective cooperation researches among the alliance members. For this purpose, the five-star alliance has strategically established three research groups covering the important topics; “Electronics materials and devices (G1)”, “Environment and energy materials, devices and process (G2)”, and “Life science materials, devices and systems (G3)”. Not only within the group but also between groups, various types of multidisciplinary collaborative researches are carried out.

In addition, the five-star alliance starts new and innovative programs; "Expanded Collaborative Research" is a public offering type program for external researcher, who enforces joint research with two or more institutions members. Of-stay type cooperative research program “CORE Lab” is presided over by a young researcher as a principal investigator for carrying out “covalent” researches. The joint research program “Next Generation Young Scientists” encourages the graduate students. Support program for networking technical staffs beyond the five institutes is also promoted. All these alliance programs are promoted under the strong and mutual correlation with the “Network Joint Research Center for Materials and Devices” project.

Director of Operations
Katsuaki SUGANUMA
(ISIR)

Chair
Tohru SEKINO
(ISIR)

Vice-Chair
Masahiko TAKAHASHI
(IMRAM)

G1Leader
Shiyoshi YOKOYAMA
(IMCE)

G2Leader
Kohtaro OSAKADA
(CLS)

G3Leader
Kuniharu IJIRO
(RIES)

Dynamic Alliance & Network Joint Research Center (NJRC): History

2005: ISIR + IMRAM + Company — Triangle Collaboration between 2 Institutes and Companies: **Center for Creation of New Materials and Basic Industry Technology**

2006: ISIR + IMRAM — **1st Stage: 2 Institute Alliance for Creation of New Materials and Basic Industry Technology**

2007 ~2009: **2nd Stage: Post-Silicon Materials & Device Research Alliance by 4 Institutes**

ISIR, IMRAM, RIES, CRL ⟷ IMCE, IIS U.Tokyo (*Cooperative Institutes*)

2010 ~2015: **3rd Stage: "Nano-Macro Materials, Devices and System Research Alliance" among 5 Institutes**

- Create new materials/devices/systems by Nano-Macro fusion
- Sharing of Human/Place/Equipments: 128 joint researches

【MEXT : Project】

ISIR, IMRAM, RIES, IMCE, CLS (ex:CRL*) *CSL from FY2016

1st Term "Network Joint Research Center (NJRC) for Materials and Devices"

【MEXT Certified :Joint Usage / Research Center】

- 5 Institutes make Alliance for Joint Research Center
- About 500 theme/year
- "S" (highest) Evaluation

Link

2016~: **4th Stage: Dynamic Alliance for Open Innovation Bridging Human, Environment and Materials**

- Promote "Covalent" joint research, Targeted research subjects, and make "Innovation".

Simultaneous Linkage

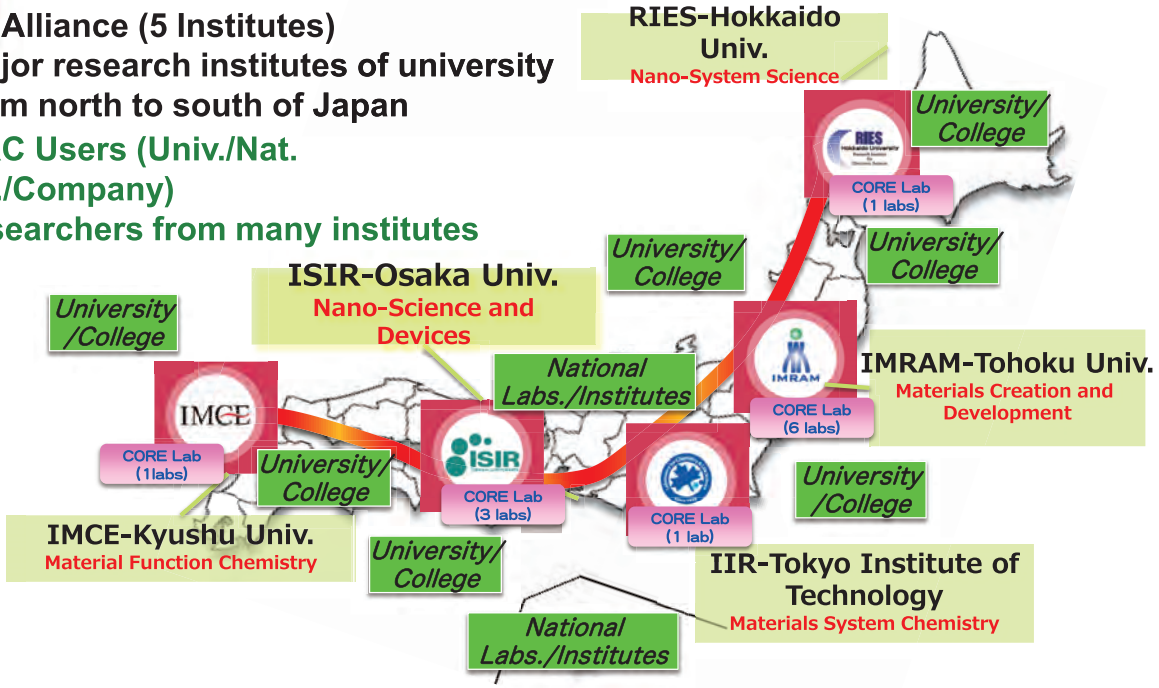
2nd Term "Network Joint Research Center for Materials and Devices"

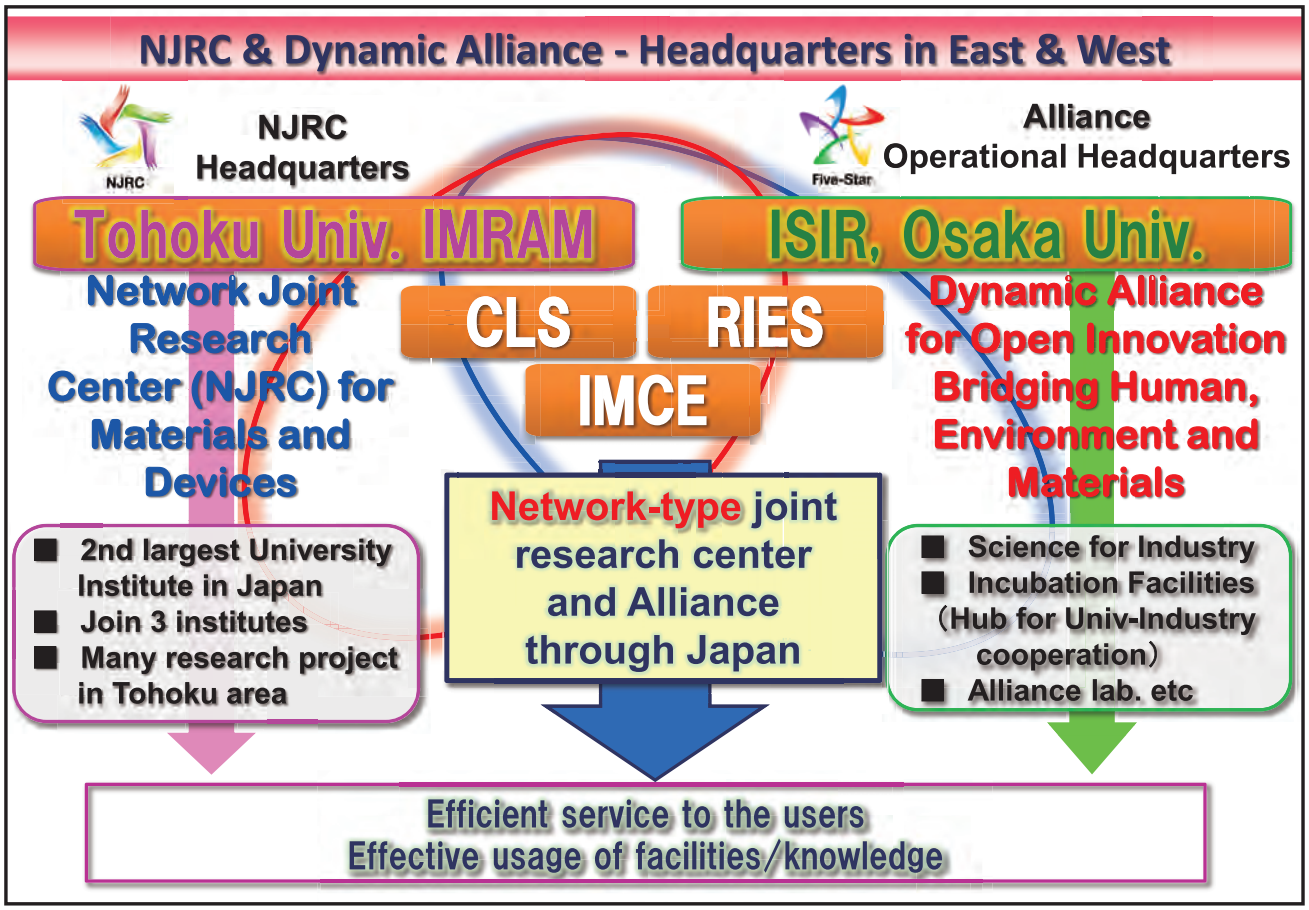
5 Institutes of NJRC/Dynamic Alliance

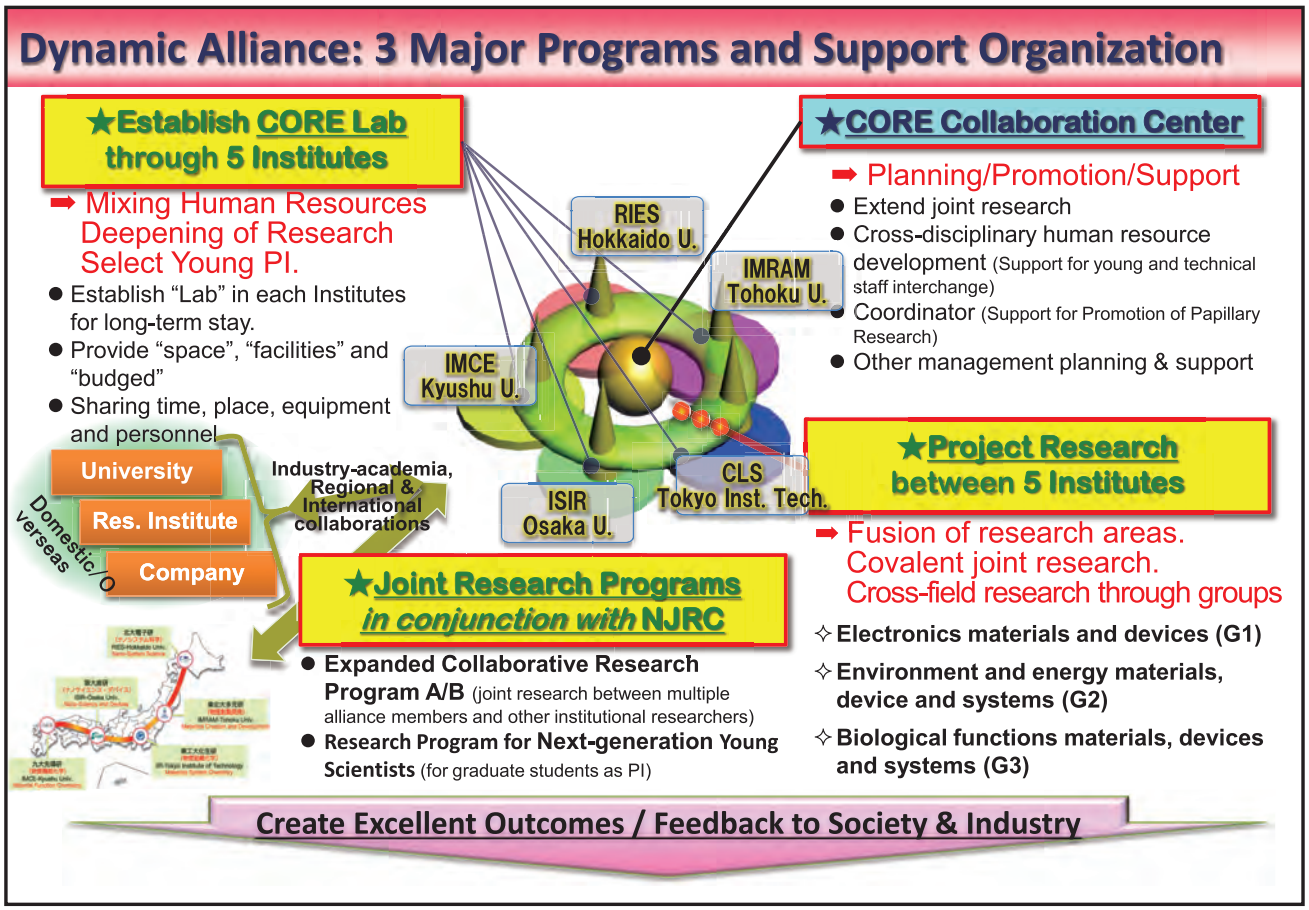
NJRC

Alliance (5 Institutes)
- Major research institutes of university
- from north to south of Japan

NJRC Users (Univ./Nat. Lab./Company)
- researchers from many institutes

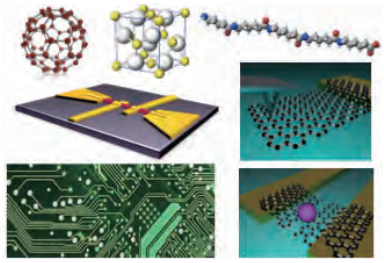



NJRC & Dynamic Alliance - Headquarters in East & West
NJRC
NJRC Headquarters
Five-Star
Alliance Operational Headquarters
Tohoku Univ. IMRAM
ISIR, Osaka Univ.
Network Joint Research Center (NJRC) for Materials and Devices
CLS
RIES
IMCE
Dynamic Alliance for Open Innovation Bridging Human, Environment and Materials
2nd largest University Institute in Japan
Join 3 institutes
Many research project in Tohoku area
Network-type joint research center and Alliance through Japan
Science for Industry
Incubation Facilities (Hub for Univ-Industry cooperation)
Alliance lab. etc
Efficient service to the users
Effective usage of facilities/knowledge

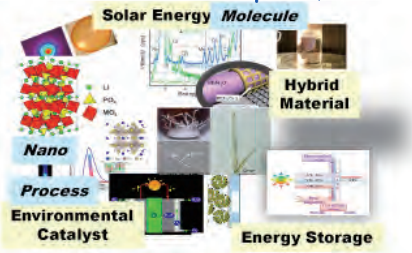

Dynamic Alliance: 3 Major Programs and Support Organization
★Establish CORE Lab through 5 Institutes
➡ Mixing Human Resources
Deepening of Research
Select Young PI.
● Establish "Lab" in each Institutes for long-term stay.
● Provide "space", "facilities" and "budged"
● Sharing time, place, equipment and personnel
University
Res. Institute
Company
Domestic/Overseas
Industry-academia, Regional & International collaborations
RIES Hokkaido U.
IMRAM Tohoku U.
IMCE Kyushu U.
ISIR Osaka U.
CLS Tokyo Inst. Tech.
★CORE Collaboration Center
➡ Planning/Promotion/Support
● Extend joint research
● Cross-disciplinary human resource development (Support for young and technical staff interchange)
● Coordinator (Support for Promotion of Papillary Research)
● Other management planning & support
★Project Research between 5 Institutes
➡ Fusion of research areas.
Covalent joint research.
Cross-field research through groups
✧ Electronics materials and devices (G1)
✧ Environment and energy materials, device and systems (G2)
✧ Biological functions materials, devices and systems (G3)
★Joint Research Programs in conjunction with NJRC
● Expanded Collaborative Research Program A/B (joint research between multiple alliance members and other institutional researchers)
● Research Program for Next-generation Young Scientists (for graduate students as PI)
Create Excellent Outcomes / Feedback to Society & Industry

Dynamic Alliance: Project Research (FY2018)

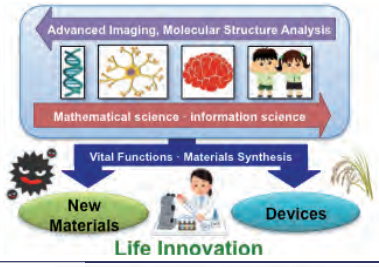
G1 : Electronics Materials and Devices Group (47 persons)



G2 : Environment and Energy Materials, Devices, and Process Group (45 persons)



G3 : Life Science Materials, Devices and System Group (57 persons)



Support for inter-research field activity

CORE Collaboration Center

- 若手人材育成
- 研究力強化
- グローバル化
- イノベーション創出

RIES / IMCE / G1 / IMRAM / ISIR / CLS — Electronics (G1)

RIES / IMCE / G2 / IMRAM / ISIR / CLS — Environment & Energy (G2)

RIES / IMCE / G3 / IMRAM / ISIR / CLS — Life Science (G3)

Sub-research Group
① Materials & Properties Analysis using Quantum Beam Science Group
② Materials & Properties Analysis using Time-resolved Technology Group

University, National Research Institute, Company, Overseas
(cooperation via group activity)

- *Expanded Collaborative Research Program*
- *CORE Labs*
- *Next-generation Young Scientists Program*

CORE Lab: Unique Long-term Stay for Young Researchers

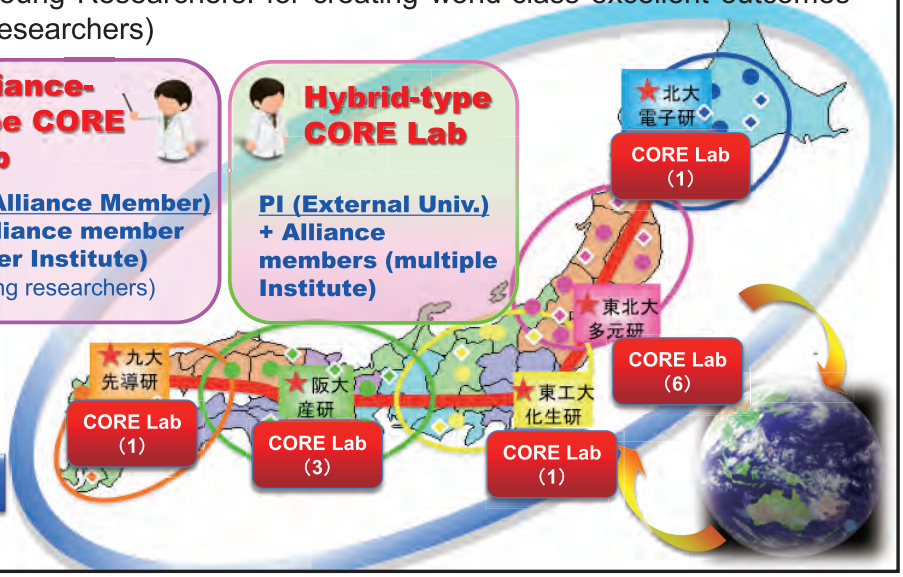
【CORE Lab】

- Start from FY2015 as the special joint research program, and officially established in FY2016 in 5 Institutes. Now 12 Labs in 5 Institutes.
- Long-term Stay: PI & Member stay >60 days/year for the joint research,
- Provide Space (rooms) in each Institutes and budged.
  → Share **"Time", "Place", "Facilities/Equipment",** and **"Personnel"**
- Encourage & support Young Researchers: for creating world-class excellent outcomes (carrier path for young researchers)

NJRC-type CORE Lab
PI (External Univ.) + Alliance member (single Institute)

Alliance-type CORE Lab
PI (Alliance Member) + Alliance member (other Institute)
(Young researchers)

Hybrid-type CORE Lab
PI (External Univ.) + Alliance members (multiple Institute)



Another Research Programs

Dynamic Alliance: International Activity

"International Joint Research Program"

- For Globalization, and Enhance Int'l Activity of Alliance/NJRC
- Any research subject matching to the projects criteria
- PI = Alliance Member (5 Institutes) + Foreign Principal Researchers

		Foreign Institutes
RIES	3	KU Leuven (Belgium), Pusan Nat Univ (Korea), Sungkyunkwan Univ (Korea), Univ. of Glasgow (UK)
IMRAM	6	Sungkyunkwan Univ (Korea), National Chiao-Tung Univ. (Taiwan, Northwestern Univ. (China, Univ. of Calgary (Canada), Univ. Sci. Tech. Beijin (China), Lanzhou Univ. (China), National Chiao Tung Univ. (Taiwan)
CLS	3	TU Berlin (Germany), A. N. Nesmeyanov Inst of Organoelement Compounds (Russia), Heidelberg Univ. (Germany)
ISIR	8	Oxford Univ. (UK), Purdue Univ. (USA), Sun Moon Univ. (Korea), POSTECH (KOrea), KAIST (Korea), Korea Univ. (Korea), Shanghai Normal Univ. (China), Bielefeld Univ. (Germany), Univ. of Maryland (USA), Univ. of Hng Kong (Chna), INRA (France)
IMCE	3	Cambridge Univ. (UK), National Tsighua Univ. (Taiwan), Wuhan Univ. Sci. Tech. (China)
Total	23	(from FY2017)

Joint Research Programs in conjunction with NJRC

Public Offering

Foundational Joint Research Program

User (PI) + Researcher in 5 Institute

:wide-range of area
:Challenging Subject
:Basic research
:Use of Facilities

314 subjects (FY2018)

■Expanded Collaborative Research Program (B):
User (PI) + 2 or more Researchers in 5 Institutes
:to be large joint research
:Expand to outstanding cross-disciplinary research

■Expanded Collaborative Research Program (A):
User (PI) + 1 Researcher in 5 Institutes
:subject to be Type-B joint research

■Research Program for Next-generation Young Scientists : Graduate Student will be PI
:Fostering top-level researchers for the next generation
· Developing research capabilities

Numbers of each joint research programs in FY2018

	Joint Res. Prog.	Exp. Coll. Res.(A)	Exp. Coll. Res.(B)	Next-Gen. Young	CORE Lab	Total
RIES	60	14	5	5	1	85
IMRAM	98	25	11	4	6	144
CLS	52	14	5	7	1	79
ISIR	52	18	10	3	3	86
IMCE	52	7	5	14	1	79
Total	314	78	36	33	12	473

Dynamic Alliance (Five-star Alliance) Organization Chart

Director of Operations
Katsuaki SUGANUMA

Steering Committee

Chair Tohru SEKINO

Vice-Chair Masahiko TAKAHASHI

RIES Toshiyuki NAKAGAKI、Kuniharu IJIRO

IMRAM Atsushi MURAMATSU、Masato KAKIHANA

CLS Toru HISABORI、Kohtaro OSAKADA

ISIR Katsuaki SUGANUMA、Hidekazu TANAKA

IMCE Jun-ichiro HAYASHI、Shiyoshi YOKOYAMA

CORE Collaboration Center

Director Tohru SEKINO

Vice-Director Masato KAKIHANA

RIES Kuniharu IJIRO、Nobuyuki TAMAOKI

IMRAM Masahiko TAKAHASHI、Masaru NAKAGAWA

CLS Kohtaro OSAKADA、Masaaki FUJII

ISIR Hidekazu TANAKA

IMCE Shiyoshi YOKOYAMA、Takeshi YANAGIDA

Coordinator Hajime ASAHI

G1 Electronics Materials and Devices

Leader Shiyoshi YOKOYAMA

Planning and Promotion Leader Takeshi YANAGIDA

RIES

Prof. K. SASAKI ※V
Prof. H. OHTA
Prof. T. NAKAMURA
Assoc. Prof. H. KAIJU
Assoc. Prof. K. KONDO
Assoc. Prof. H. FUJIWARA
Assoc. Prof. M. YAMANOUCHI

IMRAM

Prof. T. AKUTAGAWA ※V
Prof. T. J SATO※V(sub)
Prof. K. UEDA
Prof. H. OIKAWA
Prof. H. OHTANI
Prof. H. KASAI
Prof. O. KITAKAMI
Prof. H. KIMURA
Prof. H. KUMIGASHIRA
Prof. T. KOMEDA
Prof. D. SHINDO
Prof. H. JINNAI
Prof. Y. TAKAKUWA
Prof. M. TAKATA
Prof. S. CHICHIBU
Prof. M. NAKAGAWA
Prof. M. MITSUISHI
Prof. C. YOKOYAMA

CLS

Prof. A. SHISHIDO ※V
Prof. T. FUKUSHIMA
Assoc. Prof. T. IMAOKA
Assoc. Prof. Y. SHOJI

ISIR

Prof. T. SEKITANI ※V
Prof. A. OIWA
Prof. T. OGUCHI
Prof. T. KOZAWA
Prof. H. TANAKA
Prof. M. NOGI
Prof. Y. YOSHIDA
Prof. T. WASHIO
Assoc. Prof. Y. IE
Assoc. Prof. K. INOUE
Assoc. Prof. J. KANASAKI

IMCE

Prof. H. KIKUCHI ※V
Prof. K. TAMADA
Prof. T. YANAGIDA
Prof. S. YOKOYAMA
Assoc. Prof. Y. OKUMURA
Assoc. Prof. F. TANI
Assoc. Prof. K. FUJITA

※V・Vice-Leader

G2 Environment and Energy
Materials, Devices and Process

Leader Kohtaro OSAKADA

Planning and Promotion Leader Keiji NAGAI

RIES

Prof. A. ISHIBASHI ※V
Prof. H. MISAWA
Assoc. Prof. K. UENO

IMRAM

Prof. S. YIN ※V
Prof. T. ADSCHIRI
Prof. K. AMEZAWA
Prof. T. OMATA
Prof. M. KAKIHANA
Prof. J. KANO
Prof. J. KAWAMURA
Prof. S. KITAMURA
Prof. T. KYOTANI
Prof. A. TSAI
Prof. N. SATO
Prof. H. SHIBATA
Prof. E. SHIBATA
Prof. S. SUZUKI
Prof. M. TERAUCHI
Prof. I. HONMA
Prof. H. FUKUYAMA
Prof. A. MURAMATSU
Prof. H. NOGAMI
Prof. H. YAMANE

CLS

Prof. T. YAMAGUCHI ※V
Prof. M. AKITA
Prof. K. OSAKADA
Prof. K. YAMAMOTO
Assoc. Prof. T. KOIZUMI
Assoc. Prof. T. TAMAKI
Assoc. Prof. K. NAGAI
Assoc. Prof. J. NOMURA KONDO

ISIR

Assoc. Prof. S. TANAKA※V
Prof. H. KOBAYASHI
Prof. K. SUGANUMA
Prof. T. SEKINO
Prof. S. TAKEDA
Assoc. Prof. M. FUJITSUKA
Assoc. Prof. Y. HONDA

IMCE

Prof. S. OKADA ※V
Prof. J. HAYASHI
Prof. S. YOON
Assoc. Prof. M. ITO
Assoc. Prof. K. KOJIO
Assoc. Prof. Y. TAKAHASHI
Assoc. Prof. J. MIYAWAKI

G3 Life Science
Materials, Devices and System

Leader Kuniharu IJIRO

Planning and Promotion Leader Tomomi NEMOTO

RIES

Prof. M. NAGAYAMA ※V
Prof. K. IJIRO
Prof. H. UJII
Prof. T. KOMATSUZAKI
Prof. N. TAMAOKI
Prof. T. NAKAGAKI
Prof. Y. NISHINO
Prof. T. NEMOTO
Prof. V. P. BIJU
Assoc. Prof. H. AONUMA
Assoc. Prof. R. ENOKI
Assoc. Prof. K. SATO
Assoc. Prof. Y. SATO
Assoc. Prof. Y. TAKANO
Assoc. Prof. H. TERAMOTO
Assoc. Prof. K. HIRAI
Assoc. Prof. H. MITOMO

IMRAM

Prof. T. WADA ※V
Prof. A. HIBARA※V(sub)
Prof. K. INABA
Prof. S. SATO
Prof. S. TAKAHASHI
Prof. M. TAKAHASHI
Prof. F. NAGATSUGI
Prof. A. MOMOSE
Prof. S. MIZUKAMI

CLS

Prof. H. UEDA ※V
Prof. K. TANAKA
Prof. H. NAKAMURA
Prof. N. NISHIYAMA
Prof. T. HISABORI
Prof. M. FUJII
Assoc. Prof. S. ISHIUCHI
Assoc. Prof. S. IMAMURA
Assoc. Prof. T. KITAGUCHI
Assoc. Prof. S. FUSE
Assoc. Prof. M. YOSHIZAWA
Assoc. Prof. K. WAKABAYASHI

ISIR

Prof. K. NISHINO ※V
Prof. S. KURODA
Prof. K. KOMATANI
Prof. H. SASAI
Prof. M. TANIGUCHI
Prof. T. NAGAI
Prof. K. NAKATANI
Prof. M. NUMAO
Assoc. Prof. K. KAWAI
Assoc. Prof. T. SUZUKI
Assoc. Prof. Y. MAKIHARA
Specially Appointed Prof. A. YAMAGUCHI

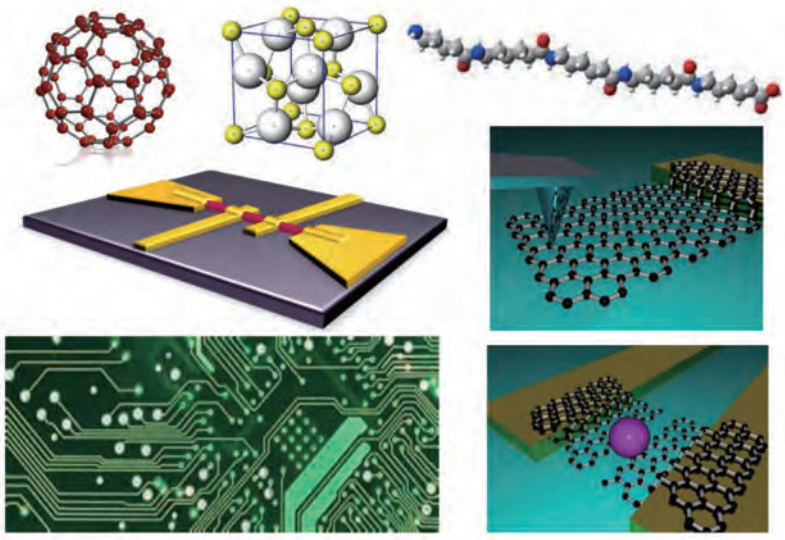
IMCE

Prof. M. TANAKA ※V
Prof. S. KIDOAKI
Prof. M. SHINDO
Prof. A. TAKAHARA
Assoc. Prof. T. ANADA
Assoc. Prof. H. ISE
Assoc. Prof. A. KANO

G1 Electronics Materials and Devices Research Project Group

Outline of G1 Research

The object of the "Electronics Materials and Devices" group (G1) is to create and control organic, inorganic, and hybrid materials for the applications of electronics, photonics, and spintronics devices. External control of materials properties and integration technique of the novel devices will be investigated to realize the new functional devices. We aim science and technological contribution to human /environmental harmony.



Main members and their research subjects

<Group Leader>
Prof.
Shiyoshi YOKOYAMA (IMCE)

■Polymer photonics for highperformance optical device application

Keywords: Nonlinear optical polymer, Nano photonics, Electro optic

<Planning and Promotion Leader>
Prof.
Takeshi YANAGIDA (IMCE)

■Creation of functional nanowire materials/properties/devices towards next generation electronics

Keywords: Functional Nanodevices, Nanowires, Electronics

<Vice-Leader>
Prof.
Keiji SASAKI (RIES)

■Optical manipulation of nanomaterials and their structures

Keywords: Optical force, Plasmonics, Nano-shaping, Optical vortex

Prof.
Hiromichi OHTA (RIES)

■Photo-electronic-thermal transport properties of conducting oxide films

Keywords: Thermoelectric, Superstructure, oxide electronics

Prof.
Takayoshi NAKAMURA (RIES)

■Development of novel electronic materials based on molecular rotators

Keywords: Molecular rotator, Supramolecules, Ferroelectrics, Multiferroics

Assoc. Prof.
Hideo KAIJU (RIES)

■Creation of nanostructured spintronic devices

Keywords: Spintronics, Nanostructures, Magnetic materials, AC impedance

Assoc. Prof.
Kenji KONDO (RIES)

■Theoretical study of spin transport and the calculation of electronic structure of low-dimensional electron gas systems

Keywords: Condensed matter theory, Spintronics, Semiconductor device engineering, First principle electronic structure calculation

Assoc. Prof.
Hideki FUJIWARA (RIES)

■Study on the application of resonance-controlled random structures

Keywords: Micro-nano cavity structures, Micro-nano lasers, Microspectroscopic imaging

Assoc. Prof.
Michihiko YAMANOUCHI (RIES)

■Study on oxide spintronics devices

Keywords: Pulsed laser deposition, Spintronics, Oxide halfmetal

<Vice-Leader>
Prof.
Tomoyuki AKUTAGAWA (IMRAM)

■Fabrication of new molecular devices with charge-transfer interactions

Keywords: Molecular crystal, Charge transfer, Ferroelectricity

<Vice-Leader(sub)>
Prof.
Taku J SATO (IMRAM)

■Spin dynamics in condensed matter by neutron inelastic scattering

Keywords: Neutron inelastic scattering, Unconventional superconductor, Quantum spin systems

Prof.
Kiyoshi UEDA (IMRAM)

■Analysis and control of electron and molecular dynamics

Keywords: X-ray free electron laser, Molecular movie, Multi-dimensional spectroscopy

Prof.
Hidetoshi OIKAWA (IMRAM)

■Creation of organic hybridized nanocrystals for optically functional materials

Keywords: Organic hybridized nanocrystal, Photonic material, Reprecipitation method

Prof.
Hiroshi OHTANI (IMRAM)

■Study on materials design based on the evolutionary algorithm

Keywords: First-principles calculations, CALPHAD, Evolutionary algorithm

Prof.
Hitoshi KASAI (IMRAM)

■Fabrication of The Novel Nanodrugs Composed of Poorly Water-Soluble Compounds

Keywords: Nano Drugs, Organic Nanoparticles, Anti-cancer Drugs

Prof.
Osamu KITAKAMI (IMRAM)

■Study on single nanomagnet for development of future memory devices

Keywords: Magnetism, Spin dynamics, Nanomagnet

Prof.
Hiroyuki KIMURA (IMRAM)

■Structural physics on novel condensed matter by complimentary use of SOR-X-ray- Neutron structure analysis

Keywords: SOR- X-ray- Neutron diffraction, Accurate magnetic and crystal structure analysis, Magnetoelectric oxides, Organic ferroelectric and magnetic materials

Prof.
Hiroshi KUMIGASHIRA(IMRAM)

■Design of novel functionalities in oxide nanostructures using advanced spectroscopy

Keywords: Synchrotron-radiation spectroscopy, Functional nanomaterials, Oxide electronics

Prof.
Tadahiro KOMEDA (IMRAM)

■Development of single molecule devices with spin degree of freedom

Keywords: Molecule electronic, Molecular spintronics, Scanning tunneling probes

Prof.
Daisuke SHINDO (IMRAM)

■Multidisciplinary research of microstructure, electromagnetic field and conductivity by advanced electron microscopy

Keywords: Electron holography, Lorentz microscopy, Microprobes

Prof.
Hiroshi JINNAI (IMRAM)

■"In-situ" 3D observations of selfassembling processes soft materials with advanced electron tomography

Keywords: Electron tomography, In-situ visualization, Self-assembling processes, Soft materials

Prof.
Yuji TAKAKUWA (IMRAM)

■Synthesis of functional materials and development of nanoprocesses

Keywords: Surface physics, Material science, Process engineering, Development of surface analysis methods

Prof.
Masaki TAKATA (IMRAM)

■Development of materials visualization photon science

Keywords: Synchrotron radiation, X-ray diffraction, Maximum entropy method, Charge density study

Prof.
Shigefusa CHICHIBU (IMRAM)

■Light-matter coupling and ultrafast spectroscopy in semiconductor nanostructures

Keywords: Femtosecond electron beam, Nitide semiconductors, Oxide semiconductors

Prof.
Masaru NAKAGAWA (IMRAM)

■Process/Material Science and Device Innovation in Nanoimprint Technology

Keywords: Print & imprint method, Lithography, Laser processing

Prof.
Masaya MITSUISHI (IMRAM)

■Hybrid polymer nanoassemblies for optoelectronic applications

Keywords: Polymer nanoassembly, Hybrid polymers, Optoelectronics

Prof.
Chiaki YOKOYAMA (IMRAM)

■Development of environmentally conscious materials using ionic liquids

Keywords: Ionic liquid, Supercritical fluid, Gallium nitride

<Vice-Leader>
Prof.
Atsushi SHISHIDO (CLS)

■Development of functional soft materials and its application to optoelectronics

Keywords: Soft material, Liquid crystal, Photonics, Polymer

Prof.
Takanori FUKUSHIMA (CLS)

■Development of new soft materials using strategically designed π-electronic systems

Keywords: π-Electronic Materials, Self-assembly, Soft materials, Organic electronics

Assoc. Prof.
Takane IMAOKA (CLS)

■Functionality programming of metal clusters based on an exact atomicity control

Keywords: Nanoparticles, Clusters, Catalysis, Photoluminescence

Assoc. Prof.
Yoshiaki SHOJI (CLS)

■Devepment of π-conjugated molecules and polymers for electronics and optoelectronics

Keywords: π-Electronic Materials, Main Group Element, Organic Devices

<Vice-Leader>
Prof.
Tsuyoshi SEKITANI (ISIR)

■Flexible integrated circuits for large-area sensor applications

Keywords: Social devices, Flexible transistors, Integrated circuits, Large-area sensors

Prof.
Akira OIWA (ISIR)

■Research on novel quantum hybrid devices based on spins and photo

Keywords: Low-dimensional semiconductor physics, Quantum information processing, Quantum hybrid system, Spintronics

Prof.
Tamio OGUCHI (ISIR)

■First-principles prediction of properties for materials design

Keywords: First-principles calculations, Transition metal systems, Surfaces and interfaces, Materials informatics

Prof.
Takahiro KOZAWA (ISIR)

■Development of lithography process and materials for semiconductor devices

Keywords: Quantum beam, Lithography, Biomaterials, Pulse radiolysis

Prof.
Hidekazu TANAKA (ISIR)

■Development of 3 dimensional oxide nano-structured electronics

Keywords: Nanostructures, Functional Oxide, Nano/Spin-electronics

Prof.
Masaya NOGI (ISIR)

■Nanocellulose materials for flexible electronics

Keywords: Nanocellulose, Transparent nanopaper, Flexible substrate

Prof.
Yoichi YOSHIDA (ISIR)

■Research of the radiation induced chemical reactions by using the atto-second electron beam

Keywords: Atto-second electron beam, Atto-second pulse radiolysis, Radiation chemistry

Prof.
Takashi WASHIO (ISIR)

■Machine Learning for Advanced Nano-electronics Devices

Keywords: Machine Learning, Advanced Sensing, Statistical Estimation

Assoc. Prof.
Yutaka IE (ISIR)

■Development of functional organic materials for electronics

Keywords: Conjugated compounds, Molecular wires, Organic and molecular devices

Assoc. Prof.
Koichi INOUE (ISIR)

■Nano carbon devices & applications

Keywords: Nanocarbon Quantum memory Bio Sensor

Assoc. Prof.
Jun'ichi KANASAKI (ISIR)

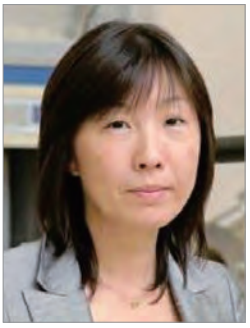
■Research on ultrafast carrier dynamics by means of time-resolved photoelectron spectroscopy

Keywords: Semiconductors, Carrier dynamics, Photoexcitation, Time-Resolved Photoelectron Spectroscopy

<Vice-Leader>
Prof.
Hirotsugu KIKUCHI (IMCE)

■Three dimensional lattice structure and Kerr effect of liquid crystal blue phases

Keywords: Liquid crystal blue phase, Electro-optic Kerr effect, Soft matter



Prof.
Kaoru TAMADA (IMCE)

■Innovative nanobio detection with plasmon nanoantenna

Keywords: Plasmonics, Nanomaterials Bioimaging

Assoc. Prof.
Yasushi OKUMURA (IMCE)

■Dynamics of dissipative system with asymmetric interaction

Keywords: Soft matter, Liquid crystal, Nanoparticle

Assoc. Prof.
Fumito TANI (IMCE)

■Development of functional organic compounds based on unique pi-electron structures

Keywords: Organic pi-compounds
NIR-dye
Redox
Semiconductivity

Assoc. Prof.
Katsuhiko FUJITA (IMCE)

■Development of fabrication process and materials for organic electronic devices

Keywords: Organic electronics, Organic photovoltaic cells, OLED

About Logo:

The Dynamic Alliance (Five-Star Alliance) has established a logo mark consisting of five colored-parts, which is based on "dynamic research collaboration and dissemination" as a motif. Four patterns of simple logos (color and monochrome with and without abbreviations “Five-Star”) and corresponding four sets of mark and a name have been prepared. The NJRC has also established consistent logo marks at the same time.

ロゴマークについて

全国に跨る大学５附置研究所がネットワークを構築して実施している「人・環境と物質をつなぐイノベーション創出ダイナミック・アライアンス」では、「ダイナミックな研究連携とその発信」をモチーフとして、５色のパーツからなる一貫性のある図形で表現したロゴマークを制定した。シンプルな図形および略語（Five-Star）からなるパターン（カラーおよびモノクロ）と、名称（文字）との組み合わせからなるものであり、同時に「物質・デバイス領域共同研究拠点」でも一貫性のあるロゴマークを制定している。

Five-Star

ダイナミック・アライアンス

ダイナミック・アライアンス

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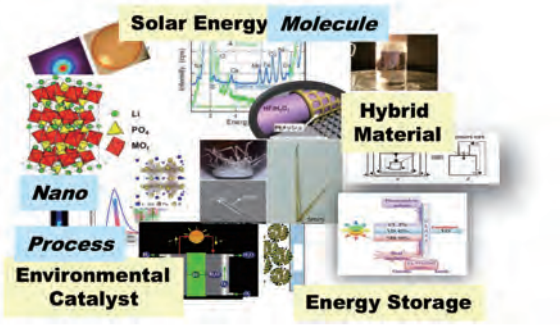
ダイナミック・アライアンス

G2 Environment and Energy Materials, Devices and Process Research Project Group

Outline of G2 Research

The activity of the "Environment and Energy Materials, Devices and Process" group (G2) covers promotion of the studies to design environmental catalysts for industry, to realize ecological processing for a low carbon society, and to create new hybrid substances for environmental and energy issues. The studies will contribute to make new environmentally benign materials and devices as well as ubiquitous system integration.



Main members and their research subjects

<Group Leader>
Prof
Kohtaro OSAKADA (CLS)
■Structure and Properties ofOrganometallic Middle-Molecule Compounds
Keywords : Silane, Organometallics, Oligomer, Optical properties

<Planning and Promotion Leader>
Assoc. Prof.
Keiji NAGAI (CLS)
■Photoenergy conversion materials -Organophotocatalyst & Quantum beam source-
Keywords : Photocatalyst, Photo-energy conversion, Water purification

<Vice-Leader>
Prof.
Akira ISHIBASHI (RIES)
■High efficiency solar cells and clean systems
Keywords : Solar cell, High efficiency, Clean system

Prof.
Hiroaki MISAWA (RIES)
■Development of artificial photosynthesis systems using plasmonic antennae
Keywords : Localized plasmon, Nanomaterials, Plasmonic chemistry

Assoc. Prof.
Kosei UENO (RIES)
■Control of light and matter using dark plasmon modes induced by metal/insulator/metal nanostructures
Metallic nanostructures, Dark plasmon, Optical force

<Vice-Leader>
Prof.
Shu YIN (IMRAM)
■Creation of multi-functional environmental responsive nanomaterials
Keywords : Multi-functional, Environmental response, Eco-materials

Prof.
Tadafumi ADSCHIRI (IMRAM)

■Supercritical hydrothermal synthesis of organic-inorganic hybrid nanoparticles

Keywords : Supercritical fluid, Organic inorganic hybrid materials, Nanoparticles

Prof.
Koji AMEZAWA (IMRAM)

■Development of environmentally-friendly energy conversion devices based on solid state ionics

Keywords : Solid state ionics, Energy conversion, Fuel cells Batteries

Prof.
Takahisa OMATA (IMRAM)

■Development of inorganic energy conversion materials using ion-exchange

Keywords : Material Design, Topotactic Ion-Exchange, Proton Conductor, Solar Cell Absorber

Prof.
Masato KAKIHANA (IMRAM)

■Construction of high-performance photoceramics

Keywords : Photocatalyst, Phosphor, Exploration of new materials

Prof.
Junya KANO (IMRAM)

■Novel powder processing for renewable energy and its efficiency improvement

Keywords : Biomass, Mechanochemical processing, DEM simulation

Prof.
Junichi KAWAMURA (IMRAM)

■Measurement of ion dynamics by NMR and laser spectroscopy for the application to energy storage materials

Keywords : Lithium ion battery, NMR imaging, In-situ spectroscopy, Solid state ionics

Prof.
Shin-ya KITAMURA (IMRAM)

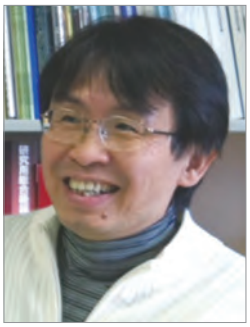
■Study on valorization of steelmaking slag as ecofriendly material

Keywords : Steelmaking slag, Fertilizer, Leaching, Recycle

Prof.
Takashi KYOTANI (IMRAM)

■Synthesis and design of novel nanocarbon materials and their nanohybrids

Keywords : Energy storage media, Bio-application of nanocarbons, Graphene



Prof.
An-Pang TSAI (IMRAM)

■Studies on formation of quasicrystal and catalysts in terms of metallurgy

Keywords : Quasicrystal, Intermetallic compound, Electron compound, Catalysts

Prof.
Nobuaki SATO (IMRAM)

■Development of dry and wet processes for rare metal resources containing radioactive materials

Keywords : Rare metal resources, Radioactive materials, Material processing

Prof.
Etsuro SHIBATA (IMRAM)

■Establishment of metal resource circulation engineering

Keywords : Non-ferrous metallurgy, Recycling, Waste treatment

Prof.
Hiroyuki SHIBATA (IMRAM)

■Thermal properties of molten silicates and solution growth of SiC

Keywords : Thermal property, Molten silicates, Silicon carbide, Solution growth

Prof.
Shigeru SUZUKI (IMRAM)

■Characterization and control of functional base-metal oxides and alloys

Keywords : Functional materials, Iron based oxides, Iron based alloys

Prof.
Masami TERAUCHI (IMRAM)

■Electron crystallography & spectroscopy based on electron microscopy

Keywords : Convergent-beam electron diffraction, Electron energy-loss spectroscopy, Soft-X-ray emission spectroscopy

Prof.
Hiroyuki FUKUYAMA (IMRAM)

■High-temperature physical chemistry of materials

Keywords : Chemical thermodynamics, Thermophysical properties of high-temperature melts, Crystal growth

Prof.
Itaru HONMA (IMRAM)

■Advanced nanotechnologies for energy conversion devices

Keywords : Lithium ion batteries, Supercapacitor, Solar cells/Fuel cells, Nanomaterials/Nanoprocessing

Prof.
Hiroshi NOGAMI (IMRAM)

■Development of novel material processing through kinetic based reaction analysis

Keywords : Process analysis, Thermal fluid analysis, Reaction kinetics

Prof.
Atsushi MURAMATSU (IMRAM)

■Synthesis processing of nanoparticulate functional materials in liquid-phase

Keywords : Nanoparticles, Synthesis process, Hybrid materials

Prof.
Hisanori YAMANE (IMRAM)

■Synthesis and crystal structure analysis of new ceramic materials

Keywords : Multinary nitrides and oxides, X-ray diffraction, Flux growth

<Vice-Leader>
Prof.
Takeo YAMAGUCHI (CLS)

■Design and deve;opment for fuel cell materials and devices

Keywords : Electrolyte membrane, Catalysts, Polymer electrolyte fuel cell, Solid alkaline fuel cell

Prof.
Munetaka AKITA (CLS)

■Visible light-driven organic synthesis by photoredox catalysis

Keywords : Visible light, Photoredox catalysis, Organic synthesis

Prof.
Kimihisa YAMAMOTO (CLS)

■Development of Subnano Hybrid Materials

Keywords : Subnano Particles, Dendrimer, Hybrid Materials

Assoc. Prof.
Take-aki KOIZUMI (CLS)

■Development of transition metal complexes bearing functional ligands

Keywords : Transition metal complexes, Low Environmental load type reaction, Dynamic behavior

Assoc. Prof.
Takanori TAMAKI (CLS)

■Development of High-Performance Enzymatic Biofuel Cells

Keywords : Bioelectrochemistry, Enzyme, Systematic material design

Assoc. Prof.
Junko NOMURA KONDO (CLS)

■Preparation of mesoporous metal oxides and IR characterization of solid calayst surfaces

Keywords : Porous material, Metal oxide, IR, Catalyst

<Vice-Leader>
Assoc. Prof.
Shin-ichiro TANAKA (ISIR)

■Electron dynamics in the solid and on the solid surface by means of the electon spectscopies

Keywords : Time-resolved two-photon photoelectron spectroscopy. High-resolution angle-resolved photoelectron spectroscopy. High-resolution electron-energy loss spectroscopy.

Prof.
Hikaru KOBAYASHI (ISIR)

■New chemical methods to fabricate highly efficient Si solar cells, and fabrication and application of Si nanopowder

Keywords : silicon, surface control, hydrogen generation, Li ion battery

Prof.
Katsuaki SUGANUMA (ISIR)

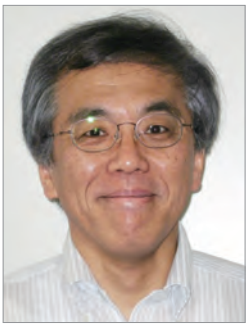
■Wearable stretchable and WBG power intrconnections

Keywords : Printed electronics, Stretchable wiring, WBG Power interconnection

Prof.
Tohru SEKINO (ISIR)

■Creation of multifunctional materials via low-dimensional nano-macro structure and function tuning

Keywords : Nanocomposite, Low-dimentional nanomaterials, Functional Structure Ceramics



Prof.
Seiji TAKEDA (ISIR)

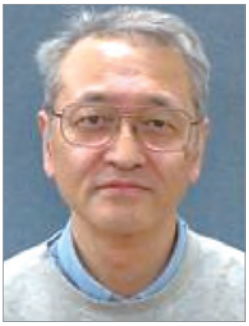
■Operando study of nanoparticulate catalysts

Keywords : CO oxidation, Environmental transmission electron microscopy, Gold

Assoc. Prof.
Mamoru FUJITSUKA (ISIR)

■Chemistry of higly activated species generated by photo- and electron beam irradiation

Keywords : Excited intermediate, super oxidant, super reductant, photocatalyst



Assoc. Prof.
Yoshihide HONDA (ISIR)

■Development of diagnost ic methods for materials based on radiation-related technology

Keywords : Polymer, Clay, Positron, Electron beam

<Vice-Leader>
Prof.
Shigeto OKADA (IMCE)

■Development of post lithium-ion batteries

Keywords : Sodium-ion battery, Cathode active material, Intercalation, Conversion reaction

Prof.
Jun-ichiro HAYASHI (IMCE)

■Energy/material-efficient conversion of fossils and biomass to fuels/chemicals/materials

Keywords : Reactor/process design, Chemical kinetics, Thermal/catalytic reactions

Prof.
Seong-Ho YOON (IMCE)

■Development of high anti-oxidative carbon supporting material and its application to PEMFC catalyst

Keywords : Fuel Cell
Carbon black
Anti-oxidative

Assoc. Prof.
Masato ITO (IMCE)

■Molecular design for energy saving

Keywords : Electrode active material, Gas barrier material, Molecular catalyst

Assoc. Prof.
Ken KOJIO (IMCE)

■Development of recyclable tough elastomers

Keywords : Thermoplastic elastomers
Recycle
Tough

Assoc. Prof.
Yoshiaki TAKAHASHI (IMCE)

■Hierarchical structure and physical properties of polymers

Keywords : Natural polymers, Ionic liquids, Rheology

Assoc. Prof.
Jin MIYAWAKI (IMCE)

■Design and development of high-performance porous adsorbent materials

Keywords : Porous materials, Adsorption, Heat pump

G3 Life Science Materials, Devices and System Research Project Group

Outline of G3 Research

The objective of the "Life Science Materials, Devices and System" group(G3) is to create cutting-edge technologies for the elucidation of biological functions by advanced optical imaging, molecular structural analyses, and utilizing mathematical and information sciences. By the harmonized developments in information of both biomolecules and biological functions and the synthesis of molecules, we provide novel functional materials and devices that contribute to life-innovation in the 21st century.

Main members and their research subjects

<Group Leader>
Prof.
Kuniharu IJIRO (RIES)

■Development of biomimetic nanofabrication method using molecular self-assembly

Keywords: Biomimetics, Nanomaterial, Self-assembly

<Planning and Promotion Leader>
Prof.
Tomomi NEMOTO (RIES)

■Cutting-edge optical imaging and cell physiology of neural and secretory activities

Keywords: Two-photon microscopy, Super-resolution microscopy, Molecular and cellular physiology

<Vice-Leader>
Prof.
Masaharu NAGAYAMA (RIES)

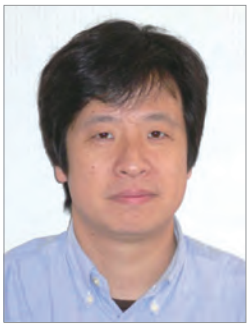
■Understanding of nonlinear phenomena using mathematical modeling

Keywords: Mathematical modeling, Reaction-diffusion system, Numerical simulation

Prof.
Hiroshi UJI-I (RIES)

■Investigations of heterogeneous dynamics at mesoscopic scale using super-resolution fluorescence (single molecule) and Raman microscopy, particularly, biological issues.

Keywords: Single molecule, Heterogeneous dynamics, Nanoscopy



Prof.
Tamiki KOMATSUZAKI (RIES)

■Developments of data-driven mathematics and concepts in single molecule biology

Keywords: Single molecule biology, Multiscale dynamics in complex systems, Molecular data science

Prof.
Nobuyuki TAMAOKI (RIES)

■Synthesis of light-driven molecular machines

Keywords: Motor protein, Photochromic compound, Liquid crystal

Prof.
Toshiyuki NAKAGAKI (RIES)

■Ethology of single celled organism viewed from physical equation of motion

Keywords : Mathematical modeling, Protozoa, Nonlinear dynamics, Biomechanics

Prof.
Yoshinori NISHINO (RIES)

■Deep Nano-Imaging using synchrotron radiation and X-ray free-electron lasers

Keywords : Phase imaging, Controlled environment imaging, Coherent X-rays

Prof.
Vasudevan P. BIJU (RIES)

■Photonic molecules and nanomaterials for single-molecule detections, bio–imaging, and optical displays

Keywords : photonic molecules, nanomaterials, single molecule fluorescence, fluorescence sensors

Assoc. Prof.
Hitoshi AONUMA (RIES)

■Understanding real time adaptability of animal behavior

Keywords : Neurobiology, Synthetic neuroethology, Neuro-robotics

Assoc. Prof.
Ryosuke ENOKI (RIES)

■Optical Monitoring of Neuronal Network in the Master Circadian Clock

Keywords : Circadian Rhythm, Optical Imaging, Neuronal Network

Assoc. Prof.
Katsuhiko SATO (RIES)

■Role of mechanical forces in complex phenomena in biological systems

Keywords : Mechanical models, Morphogenesis, Rheology

Assoc. Prof.
Yuzuru SATO (RIES)

■Random dynamical systems approaches to nonlinear complex phenomena

Keywords : complex systems, chaos, random dynamical systems, time series analysis

Assoc. Prof.
Yuta TAKANO (RIES)

■Development of photofunctional molecular tools for understanding and controlling biological functions

Keywords : Photoinduced electron transfer, Luminescence sensor, Phototherapy, Carbon nanomaterials

Assoc. Prof.
Hiroshi TERAMOTO (RIES)

■Application of Singularity Theory to Material Science

Keywords : Singularity Theory, Topological Insulator, Non-adiabatic Transition

Assoc. Prof.
Kenji HIRAI (RIES)

■Light-assisted Synthesis of Functional Nanomaterials

Keywords : Coordination Polymers, Nanomaterials, Plasmonics

Assoc. Prof.

Hideyuki MITOMO (IMRAM)

■Development of functional devices using metal nanoparticles and soft matter

Keywords: Soft matter, Metal nanoparticles assemblies, Plasmonic devices

<Vice-Leader>

Prof.

Takehiko WADA (IMRAM)

■Novel strategy for ischemia cell specific oligonucleotide therapeutics with intracellular environmental condition responsible artificial nucleic acid

Keywords: Oligonucleotide therapeutics, Active Control

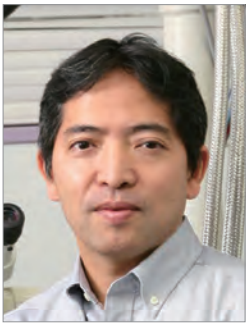
<Vice-Leader(sub)>

Prof.

Akihide HIBARA (IMRAM)

■Nano-microfluidic analytical devices and microscopy

Keywords: Nanoflluidics, Microfluidics, Light scattering, Liquid ingterfaces



Prof.

Kenji INABA (IMRAM)

■Structural and mechanistic basis of cellular systems involved in protein quality control

Keywords: Protein quality control, Redox, Molecular chaperone, X-ray crystal structure analysis

Prof.

Shunichi SATO (IMRAM)

■Laser application for material science

Keywords: Photonics, Vector beam, Intense laser

Prof.

Satoshi TAKAHASHI (IMRAM)

■Dynamics of protein folding and function based on single molecule fluorescence spectroscopy

Keywords: Dynamics, Protein folding, Single Molecule Spectroscopy

Prof.

Masahiko TAKAHASHI (IMRAM)

■Towards investigation of the origins of molecular functions by developing methods to visualize electron motion in matter

Keywords: Electron Compton scattering, Electron momentum spectroscopy, Momentum space wave function

Prof.

Fumi NAGATSUGI (IMRAM)

■Development of the functional molecules for regulation of gene expression

Keywords: Antisense, Reactive oligonucleotide, miR

Prof.

Shin MIZUKAMI (IMRAM)

■Development of bioanalytical technology based on functional molecular probe design

Keywords: Bioimaging probes, Chemical biology, Photofunctional molecules

Prof.

Atsushi MOMOSE (IMRAM)

■Visualization of biomedical materials with X-ray phase imaging

Keywords: X-ray, Phase contrast, Tomography

<Vice-Leader>
Prof.
Hiroshi UEDA (CLS)

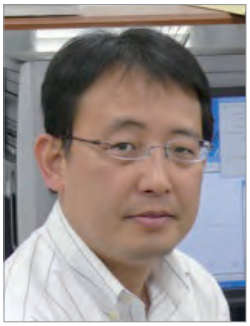
■Developing novel diagnostic systems by protein modification and split reactions

Keywords: Fluorescence Quenching, Luciferase, Protein-Protein Interaction

Prof.
Kan TANAKA (CLS)

■Development of tetrapyrrole sensory devices toward the control of cell processes

Keywords: Tetrapyrrole, Organelle, Cell proliferation



Prof.
Hiroyuki NAKAMURA (CLS)

■Control of Biofunctions Using Photosensitizing Molecules and Application to Medicinal Chemsitry

Keywords: Protein modification, Photosensitizer, Anticancer drug design

Prof.
Nobuhiro NISHIYAMA (CLS)

■Development of smart diagnostic and therapeutic systems based on synthetic functional polymers

Keywords: DDS, Nanomedicine, Functional polymer, Imaging

Prof.
Toru HISABORI (CLS)

■Functional Analysis of Redox-Regulated Biological Systems

Keywords: Photosynthesis, Redox regulation, Bioenergetics, ATP synthase

Prof.
Masaaki FUJII (CLS)

■Functional Analysis of Molecular Building Blocks by Advanced Laser Spectroscopy

Keywords: Molecular Recognition, Laser Spectroscopy, Intermolecular Interaction

Assoc. Prof.
Shun-ichi ISHIUCHI (CLS)

■Elucidation of molecular recognition mechanism by bottom-up approach

Keywords: Molecular Recognition, Laser Spectroscopy, Mass spectrometry

Assoc. Prof.
Sousuke IMAMURA (CLS)

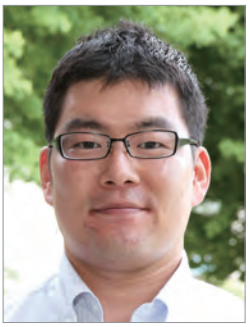
■Biofuel production using microalgae

Keywords: biofuel production, microalga, nitrogen signaling

Assoc. Prof.
Tetsuya KITAGUCHI (CLS)

■Development of biosensors based on fluorescent proteins

Keywords: Fluorescent protein, Cell Signaling, Biosensor



Assoc. Prof.
Shinichiro FUSE (CLS)

■Natural product science based on micro-flow synthesis

Keywords: Micro-flow, Natural product, Medicinal Chemistry

Assoc. Prof.
Michito YOSHIZAWA (CLS)

■Functional molecular capsules with polyaromatic panels

Keywords: Assembly, Capsule, Polyaromatic, Recognition

Assoc. Prof.
Ken-ichi WAKABAYASHI (CLS)

■Photomovement in the green algae: from photoreception to flagellar regulation

Keywords: Chlamydomonas, Volvox, Flagella, Channelrhopsin

<Vice-Leader>
Prof.
Kunihiko NISHINO (ISIR)

■Development of new strategies to tackle infectious diseases

Keywords: Multidrug resistance, Antimicrobial chemotherapy, Systems biology

Prof.
Shun'ichi KURODA (ISIR)

■Development of In Vivo Pinpoint Drug Delivery System Inspired by the Viral Infection Machinery

Keywords: Virus, Nanocarrier, DDS

Prof.
Kazunori KOMATANI (ISIR)

■Robot dialogue system based on speech information processing technology

Keywords: Speech recognition, Dialogue system, Humanoid robot, Ontology

Prof.
Hiroaki SASAI (ISIR)

■Development of Novel Enantioselective Reactions

Keywords: Multi-functional Catalyst, Enantioselective Catalyst, Domino Reaction, Helicenes

Prof.
Masateru TANIGUCHI (ISIR)

■Development of bio-nanodevices using single-molecule analysis

Keywords: Single Molecular Science, Single Molecule Analysis, Biomolecules

Prof.
Takeharu NAGAI (ISIR)

■Development and application of fluorescent and chemiluminescent protein for bioscience research

Keywords: Fluorescent protein, Chemiluminescent protein Bioimaging

Prof.
Kazuhiko NAKATANI (ISIR)

■Studies on interaction of small molecules to nucleic acids

Keywords: Micro RNA, Riboswitch, Regulation of gene expression

Prof.
Masayuki NUMAO (ISIR)

■Artificial intelligence and visualization for the diagnosis of fuel cells and rechargeable batteries

Keywords: Machine learning, Acoustic emission, Fuel cell

Assoc. Prof.
Kiyohiko KAWAI (ISIR)

■Single molecule fluorescence measurement for analytical/diagnostic applications

Keywords: Fluorescence, Blinking, Single molecule

Assoc. Prof.
Takeyuki SUZUKI (ISIR)

■Development of environmentally benign oxidation for the catalytic asymmetric synthesis

Keywords: Iridium catalyst, Hydrogen transfer, Oxidation

Assoc. Prof.
Yasushi MAKIHARA (ISIR)

■iNPH diagnosis support based on gait image analysis

Keywords: Gait, Computer vision, iNPH

Specially Appointed Prof.
Akihito YAMAGUCHI (ISIR)

■Studies on the structural basis of bacterial multidrug efflux transport

Keywords: Multidrug efflux, Multidrug resistance, X-ray crystallography

<Vice-Leader>
Prof.
Masaru TANAKA (IMCE)

■Design of biocompatible soft-biomaterials for medical devices

Keywords: Biocompatibility, Cell adhesion, Bio-interfaces, Water structure

Prof.
Satoru KIDOAKI (IMCE)

■Development of mechanobio-materials for cell manipulation

Keywords: Mechanobio-materials, Cell machanotaxis, Microelasticity patterning

Prof.
Mitsuru SHINDO (IMCE)

■Design and synthesis of useful organic molecules for life science

Keywords: Organic synthesis, Chemical biology, Bioactive compounds

Prof.
Atsushi TAKAHARA (IMCE)

■Precise structure control of soft interfaces for biomedical applications

Keywords: Soft Interfaces, Biointerface, Soft material

Assoc. Prof.
Takahisa ANADA (IMCE)

■Design of biocompatible soft-biomaterials for medical devices

Keywords: Biocompatibility
Cell adhesion
Bio-interfaces
Water structure

Assoc. Prof.
Hirohiko ISE (IMCE)

■Development of medical devices using carbohydrate-bearing polymers

Keywords: Carbohydrates, Biomaterials, Cell biology

Assoc. Prof.
Arihiro KANO (IMCE)

■New strategy for cancer treatment based on the metabolic abnormalities

Keywords: Cancer, Glycolysis, Warburg Effect

Five-star Alliance-5 University Institutes

Director
Toshiyuki NAKAGAKI

北海道大学電子科学研究所 (RIES)

〒001-0020　札幌市北区北 20 条西 10 丁目
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Research Institute for Electronic Science,
Hokkaido University.
Kita 20 Nishi 10, Kita-ku, Sapporo 001-0020

Director
Atsushi MURAMATSU

東北大学多元物質科学研究所 (IMRAM)

〒980-8577　仙台市青葉区片平 2-1-1
TEL 022-217-5204　FAX 022-217-5211

Institute of Multidisciplinary Research for Advanced Materials, Tohoku University.
Katahira 2-1-1, Aoba-ku, Sendai 980-8577

Director
Toru HISABORI

東京工業大学化学生命科学研究所 (CLS)

〒226-8503　横浜市緑区長津田町 4259
TEL 045-924-5961　FAX 045-924-5976

Laboratory for Chemistry and Life Science,
Tokyo Institute of Technology
4259 Nagatsuta, Midori-ku, Yokohama 226-8503

Director
Katsuaki SUGANUMA

大阪大学産業科学研究所 (ISIR)　アライアンス事業本部

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