



ACTIVITIES OF
INTERNATIONAL **J**OINT
USAGE/**R**ESEARCH
CENTER

iJURC Cooperative Research Subjects 2023

(1 April 2023 ~ 31 March 2024)

STARTING-UP SUBJECTS (IN SPECIFIC FIELDS CHOSEN BY iJURC)

Radiolysis of Concentrated Native Proteins by Accelerated Electrons

RAFFY, Quentin, Institut Pluridisciplinaire Hubert Curien (IPHC)
Host in iJURC OGAWARA, Ryo I

Development of New Nano-Structure Target for ISOL
OHNISHI, Tetsuya, Nishina Center for Accelerator-Based Science, RIKEN

Host in iJURC WAKASUGI, Masanori

High-Pressure synthesis and Li Conducting Study of Li-Al-Cl Compounds as Solid Electrolytes in Batteries

KOEDTRUAD, Anucha, Chinese Academy of Science (CAS), Institute of High Energy Physics (IHEP), Chinese Spallation Neutron Source (CSNS)

Host in iJURC SHIMAKAWA, Yuichi I

Crystal Structures and Oxygen Conduction Properties Research of Metal Oxides at High Temperature

GUO, Haichuan, China Spallation Neutron Source Science Center (CSNS), Institute of High Energy Physics, Chinese Academy of Sciences

Host in iJURC SHIMAKAWA, Yuichi I

Development of Transformation of Lignin-Based Aromatic Building Blocks Using Organocatalyst

HASHIMOTO, Toru, Department of Applied Chemistry, Faculty of Engineering, Sanyo-Onoda City University

Host in iJURC NAKAMURA, Masaharu I

Synthesis of Phosphine-Protected Iron Clusters to Study Their Magnetic Properties

SHIGA, Takuya, Department of Chemistry, Institute of Pure and Applied Sciences, University of Tsukuba

Host in iJURC HIGAKI, Tatsuya

Catalytic Activation of Silicon-Oxygen Bond via Nucleophilic Activation of Silane

KAMEO, Hajime, Department of Chemistry, Graduate School of Science, Osaka Metropolitan University

Host in iJURC OHKI, Yasuhiro

Asymmetric Synthesis of Planar-Chiral Metallocenes by Plane-to-Plane Chirality Transfer

OGASAWARA, Masamichi, Department of Natural Science, Graduate School of Science and Technology, and Research Cluster on "Functional Material Development for Agro-/Medo-/Pharmaceuticals", and Tokushima International Science Institute, Tokushima University

Host in iJURC OHKI, Yasuhiro

Carbon Fixation Catalysts Composed of Well-Defined Cu-Hydride Complexes and Functionalized Organosilica

NAKAJIMA, Takayuki, Department of Chemistry, Faculty of Science, Nara Women's University

Host in iJURC OHKI, Yasuhiro

Development of Highly Active Metal Cluster Catalysts by Using Electron Transfer Network

KONDO, Mio, Division of Applied Chemistry, Graduate School of Engineering, Osaka University

Host in iJURC TANIFUJI, Kazuki F

Modulated Luminescence of Coordination Complex under Vibrational Strong Coupling

HIRAI, Kenji, Research Institute for Electronic Science Hokkaido University

Host in iJURC KANEMITSU, Yoshihiko

Spectroscopic Study of Dot-in-Crystal Perovskites toward Semiconductor Optical Refrigeration

YAMADA, Yasuhiro, Graduate School of Science, Chiba University

Host in iJURC KANEMITSU, Yoshihiko

Quantum Properties of Lead Perovskite Solar Cells by Two-Dimensional Optical Fourier Transform Spectroscopy

OGAWA, Yoshihiro, Joetsu University of Education

Host in iJURC KANEMITSU, Yoshihiko

Terahertz Laser by Topological Edge States in Non-Hermitian Systems

OBUSE, Hideaki, Faculty of Engineering, Hokkaido University

Host in iJURC HIRORI, Hideki

Controlling Hydrogen Spillover on Oxides

HOSOKAWA, Saburo, Faculty of Materials Science and Engineering, Kyoto Institute of Technology

Host in iJURC KAN, Daisuke

Development of Defective Nickel Oxide Catalysts for Highly Selective Functionalization

TAKETOSHI, Ayako, Faculty of Engineering, Yokohama National University

Host in iJURC NAKAMURA, Masaharu F

Efficient Synthesis and Physical Properties of π -Extended Molecules Bearing Difluoroboryl or Sulfonyl Groups

MITSUDO, Koichi, Graduate School of Natural Science and Technology, Okayama University

Host in iJURC WAKAMIYA, Atsushi

A Study on Statistical Machine Learning for Efficient Graph Structured Data Analysis

KARASUYAMA, Masayuki, Department of Computer Science, Nagoya Institute of Technology

Host in iJURC MAMITSUKA, Hiroshi I

Evaluation of Prediction with MetNetComp Using Tensor Decomposition Based Unsupervised Feature Extraction

TAGUCHI, Yoshihiro, Faculty of Science and Engineering, Chou University

Host in iJURC TAMURA, Takeyuki

Control and Analysis of Complex Networks via Probabilistic Minimum Dominating Sets

NACHER, Jose, Department of Information Science, Faculty of Science, Toho University

Host in iJURC AKUTSU, Tatsuya

I: International Joint Research

F: Female PI

Elucidation of Host-Giant Virus Interaction Using Transcriptomics of Giant Virus-Infected *Acanthamoeba* Cells
TAKEMURA, Masaharu, Institute of Arts and Sciences, Kagurazaka Division, Tokyo University of Science
Host in iJURC OGATA, Hiroyuki

Development of a Viral Genome Information Infrastructure for Elucidation of Viral Dark Matter
NISHIMURA, Yosuke, JAMSTEC, Japan Agency for Marine-Earth Science and Technology, Research Center for Bioscience and Nanoscience
Host in iJURC OGATA, Hiroyuki

Combining Tellurium Mediated Radical Polymerization and Multicomponent Polymerization towards Unique Stimuli Responsive Polypeptoids/poly(N-vinyl amide)s Copolymers
DEBUIGNE, Antoine, Chemistry Department, Center for Education and Research on Macromolecules, University of Liege, Belgium
Host in iJURC YAMAGO, Shigeru I

Studies of Geometric and Electronic Structure/Reactivity Correlation in Cofacial Metalloporphyrin Dimers
OHTA, Takehiro, Department of Applied Chemistry, Faculty of Engineering, Sanyo-Onoda City University
Host in iJURC OHKI, Yasuhiro

Synthesis of Self-Assembled Azulene Derivatives Utilizing Boron, and Creation of New Reactions and Functions
WAKABAYASHI, Shigeharu, Department of Clinical Nutrition, Faculty of Health Science, Suzuka University of Medical Science
Host in iJURC OHKI, Yasuhiro

Controlling of Secondary Structure in Polysiloxane Main Chain and Application for Chiral Silica
HIRAI, Tomoyasu, Department of Applied Chemistry, Osaka Institute of Technology
Host in iJURC TAKENAKA, Mikihito

Exploration of Novel Optical Phenomena in Semiconductors with High Quantum Efficiency of Radiation
KOJIMA, Kazunobu, Graduate School of Engineering, Osaka University
Host in iJURC KANEMITSU, Yoshihiko

Stoichiometry of Bioactive Trace Metals in the Osaka Bay and Its Inflowing River Waters
NAKAGUCHI, Yuzuru, Faculty of Science and Engineering, Kindai University
Host in iJURC SOHRIN, Yoshiki

Study on High Selective Membrane Separation of Metal Ions by Use of Polymer Inclusion Membranes of Ionic Liquid Containing the Metal Complexes
MUKAI, Hiroshi, Faculty of Education, Kyoto University of Education
Host in iJURC SOHRIN, Yoshiki

Fabrication and Characterization of Luminescent Thin Films of Lanthanide Complexes for Solid-State Ion Sensors
MIEDA, Eiko, Department of Chemistry, Graduate School of Science, Osaka Metropolitan University
Host in iJURC HASEGAWA, Takeshi F

Physicochemical Characterization of Novel Hybrid Partially Fluorinated Phospholipid Bilayers
SONOYAMA, Masashi, Faculty of Science and Technology, Gunma University
Host in iJURC HASEGAWA, Takeshi

Characterization of Molecular Orientation during Wear of Fluoropolymer
KASUYA, Motohiro, Faculty of Production Systems Engineering and Sciences, Komatsu University
Host in iJURC HASEGAWA, Takeshi

Identification of Active Gibberellins in the Basal Land Plant *Marchantia polymorpha*
KOHCHI, Takayuki, Graduate School of Biostudies, Kyoto University
Host in iJURC YAMAGUCHI, Shinjiro

Preparation and Precise Characterization of Model Two-Dimensional Sheet-Shaped Polymers
DOI, Yuya, Department of Materials Physics, Nagoya University
Host in iJURC SATO, Takeshi

Spin Signals in a Ferrimagnetic Film near the Compensation Temperature
HIROHATA, Atsufumi, Nagoya University, Department of Materials Physics
Host in iJURC ONO, Teruo I

Study on the Spin Injection Using Perpendicularly Magnetized Ferromagnetic Conductor Film
TANAKA, Masaaki, Nagoya Institute of Technology
Host in iJURC ONO, Teruo

Demonstration of Topological Phase Control in Chalcogenide Superlattices
MOROTA, Misako, National Institute of Advanced Industrial Science and Technology (AIST)
Host in iJURC ONO, Teruo F

EXPANDING SUBJECTS (IN SPECIFIC FIELDS CHOSEN BY iJURC)

Development of Energy Sensitive Muon Spin Rotation (μ SR) Spectrometer
MA, Yue, Meson Science Laboratory, RIKEN
Host in iJURC TSUKADA, Kyo

On the Mechanism of the CO₂ Reduction Catalyzed by Cubic [Mo₃S₄Pd] Clusters: a Computational Study
SAMEERA, W. M. C., Department of Chemistry, University of Colombo
Host in iJURC OHKI, Yasuhiro I

Development and Device Evaluation of New D-A Emitters Based on Rigidified Planar Triarylborone Acceptors
MARDER, Todd B., Institut für Anorganische Chemie, Julius-Maximilians-Universität Würzburg
Host in iJURC KAJI, Hironori I

Design and Tailoring Advanced Functional Materials: Symmetry Operation and High Pressure Synthesis
CHEN, Wei-Tin, Center for Condensed Matter Sciences, National Taiwan University
Host in iJURC SHIMAKAWA, Yuichi I

High-Performance Materials for Energy Storage Electrochemical Devices
GARCIA MARTIN, Susana, Departamento de Química Inorgánica, Facultad de Ciencias Químicas, Universidad Complutense
Host in iJURC SHIMAKAWA, Yuichi I F

- Photocatalytic C-H Bond Functionalization
ALAKANANDA, Hajra, Department of Chemistry, Visva-Bharati University
Host in iJURC NAKAMURA, Masaharu I
- Development of Unsymmetrical π -Electron Systems of Heavier Main Group Elements and Elucidation of Their Property
IWAMOTO, Takeaki, Department of Chemistry, Graduate School of Science, Tohoku University
Host in iJURC MIZUHATA, Yoshiyuki I
- Creation of Effective Oxidation Scavenger for Efficient Perovskite-Based Solar Cells
SASAMORI, Takahiro, Department of Chemistry, Faculty of Pure and Applied Sciences, University of Tsukuba
Host in iJURC WAKAMIYA, Atsushi I
- A Caging Strategy for Cholinergic Optopharmacology
ARAI, Satoshi, NanoLSI, Kanazawa University
Host in iJURC OHMIYA, Hirohisa
- Development and Evaluation of THz-STM for Low-Temperature and High Magnetic Field
TACHIZAKI, Takehiro, School of Information Science and Technology, Tokai University
Host in iJURC KANEMITSU, Yoshihiko
- Regioselective C-H Activation Enabled by Substrate Recognition
ILIES, Laurean, Center for Sustainable Resource Science, RIKEN
Host in iJURC NAKAMURA, Masaharu
- Development of Co-Facial-Type Dinuclear Complexes
YAMAGUCHI, Yoshitaka, Faculty of Engineering, Yokohama National University
Host in iJURC NAKAMURA, Masaharu
- Developing Machine Learning Approaches for Prediction of Protein Stability Changes upon Missense Mutations
SONG, Jiangning, Biomedicine Discovery Institute, Monash University
Host in iJURC AKUTSU, Tatsuya I
- Integrating Omics Data and Module-Based Network with Deep Learning to Develop Cancer Type Predictive Models
YANG, Jinn-Moon, Department of Biological Science and Technology, Institute of Bioinformatics & Systems Biology, National Yang Ming Chiao Tung University
Host in iJURC AKUTSU, Tatsuya I
- Ecology and Evolution of Large and Giant DNA Viruses
DELMONT, Tom O., CNRS/Genoscope/UMR8030
Host in iJURC OGATA, Hiroyuki I
- Application of Metagenomics and a Temperature-Driven Mathematical Model to Estimate the Global Distribution of Micromonas Viruses
DEMORY, David, CNRS, UMR723
Host in iJURC ENDO, Hisashi I
- Effective Biomolecular Analysis and Application to Medical and Agricultural Research
KAYANO, Mitsunori, Research Center for Global Agromedicine, Obihiro University of Agriculture and Veterinary Medicine
Host in iJURC MAMITSUKA, Hiroshi
- Investigations into Cofactor Biosynthesis of N_2 -Reducing Enzyme via Semi-Synthetic Approach
RIBBE, Markus W., Chancellor's professor at Department of Molecular Biology and Biochemistry, Department of Chemistry, University of California, Irvine
Host in iJURC TANIFUJI, Kazuki I
- Radical-Polar Crossover Catalysis for Synthesis of Complex Natural Products
HAN, Sunkyu, Department of Chemistry, KAIST
Host in iJURC OHMIYA, Hirohisa I
- Development of Multi-Resonant TADF Emitters with Short Delayed Lifetimes and Their Use in Long Lifetime OLEDs
ZYSMAN-COLMAN, Eli, Organic Semiconductor Centre, EaStCHEM School of Chemistry, University of St Andrews
Host in iJURC KAJI, Hironori I
- Design and Synthesis of Linear Molecules for Improving Outcoupling Efficiency of Solution-Possessed OLEDs
RAJAMALLI, Pachaiyappan, Materials Research Centre, Indian Institute of Science, Bangalore
Host in iJURC KAJI, Hironori I
- Precise Synthesis and Controlling Higher Order Structure of Tadpole-Like Janus Cellulose Nanocrystal
GOTO, Atsushi, School of Physical & Mathematical Sciences - Division of Chemistry & Biological Chemistry Nanyang Technological University
Host in iJURC KINOSE, Yuji I
- Development of Lead Free Metal Halide Perovskite
TACHIBANA, Yasuhiro, School of Engineering, PMT University
Host in iJURC TERANISHI, Toshiharu I
- Synthesis of Graphene Nanoribbons Containing Non-Hexagonal Rings
CHAOLUMEN, College of Chemistry and Chemical Engineering, Inner Mongolia University (IMU)
Host in iJURC HASHIKAWA, Yoshifumi I
- Optoelectronic Materials with Open-Cage C_{60} Derivatives as Building Blocks
ZHANG, Sheng, Engineering Research Center for Nanomaterials (ERCN), Henan University
Host in iJURC MURATA, Yasujiro I
- The Reactivity of Guanidino-Isatins in Prato Cycloaddition Reaction
MARGETIC, Davor, Laboratory for physical organic chemistry, Division of organic chemistry and biochemistry, Rudjer Boskovic Institute
Host in iJURC MURATA, Yasujiro I
- Development of Functional Molecule for Efficient Perovskite Solar Cells
SAEKI, Akinori, Department of Applied Chemistry, Graduate School of Engineering, Osaka University
Host in iJURC WAKAMIYA, Atsushi I
- Electrochemical and Photochemical Degradation Reaction
INAGI, Shinsuke, School of Materials and Chemical Technology, Tokyo Institute of Technology
Host in iJURC OHMIYA, Hirohisa
- Light-Driven Organosulfur Catalysis for Sugar Modification
HIRAI, Go, Graduate School of Pharmaceutical Sciences, Kyushu University
Host in iJURC OHMIYA, Hirohisa

Synthesis of Polymers Having Carbazolophane Moiety and Their Application of Hole Transport and CPL Materials
TANI, Keita, Osaka Kyoiku University
Host in iJURC TSUJII, Yoshinobu

Elucidation of Design Principles of Covalent Organic Solid Solutions
SUZUKI, Mitsuharu, Graduate School of Engineering, Osaka University
Host in iJURC MURATA, Yasujiro

Synthesis and Properties of Emissive Triplet Diradicals
SHIMIZU, Akihiro, Graduate School of Engineering Science, Osaka University
Host in iJURC HIROSE, Takashi

Polymerization of Functional Vinyltellurides Prepared by Flow Reactors
NAGAKI, Aiichiro, Faculty of Science, Hokkaido University
Host in iJURC YAMAGO, Shigeru

Study on Dependence of Electron Delocalization on Charged, Spin and Excited States in Conjugated Macrocycles
KISHI, Ryohei, Graduate School of Engineering Science, Osaka University
Host in iJURC KAYAHARA, Eiichi

A Study on Radicals in Macrocyclic Systems: SOMO-HOMO Energy Conversion
ABE, Manabu, Graduate School of Advanced Science and Engineering, Hiroshima University
Host in iJURC KAYAHARA, Eiichi

Synthesis and Functionally Development of Donor-Acceptor Cycloparaphenylene Derivatives through Reorganization of Macrocyclic Gold Complexes via Dynamic Gold-Carbon Bonds
TSUCHIDO, Yoshitaka, Faculty of Science Division I, Tokyo University of Science
Host in iJURC KAYAHARA, Eiichi

Trace Metal Elemental and Isotopic Composition in the North Pacific Ocean: Sources and Internal Cycling (4)
HO, Tung-Yuan, Research Center for Environmental Changes, Academia Sinica
Host in iJURC SOHRIN, Yoshiki I

Resolving the Structure-Dynamics-Property Relationship in Polymer Nanocomposites under Uniaxial Stretching-III
KOGA, Tadanori, Department of Material Science and Chemical Engineering, Stony Brook University
Host in iJURC TAKENAKA, Mikihito I

High Frequency Response of Polymeric Liquids: Rheology and Dielectric Relaxation
SUKUMARAN, Sathish K., Graduate School of Organic Materials Science, Yamagata University
Host in iJURC SATO, Takeshi I

Ultrafast Exciton Dynamics in Thermally Activated Delayed Fluorescence Molecular Aggregates with Heterogeneous Conformational Distribution
SOTOME, Hikaru, Division of Frontier Materials Science and Center for Promotion of Advanced Interdisciplinary Research, Graduate School of Engineering Science, Osaka University
Host in iJURC KAJI, Hironori

Construction of Theoretical Guidelines for Designing Plasmonic Nanoalloys
IIDA, Kenji, School of Engineering, PMT University
Host in iJURC TERANISHI, Toshiharu

Characterization of Quantum Magnon Using Hybrid Magnonic Systems
KIM, Kab-Jin, Department of Physics, Korea Advanced Institute of Science and Technology
Host in iJURC ONO, Teruo I

Non-Reciprocity of Spin Wave Propagation Generated by Orbital Hall Effect in Transition Metal Dichalcogenides
KIM, Sanghoon, Department of Physics, University of Ulsan
Host in iJURC ONO, Teruo I

Research Toward Stable NV Centers at Shallow Region and Spin Dynamics in Diamond
BALASUBRAMANIAN, Gopalakrishnan, Helmholtz-Zentrum Dresden-Rossendorf (HZDR), Germany
Host in iJURC MIZUOCHI, Norikazu I

Research on the Efficiency Enhancement of the NV Centers Creation in Nanodiamond
SEGAWA, Takuya F, Laboratory for Physical Chemistry, ETH Zürich
Host in iJURC MIZUOCHI, Norikazu I

Research toward High Sensitive NV Quantum Sensor in Diamond
WRACHTRUP, Jörg, Stuttgart University
Host in iJURC MIZUOCHI, Norikazu I

Development of Fe-Based D03 Type Alloys and Its Thermoelectric Property
NAGAHAMA, Taro, Hokkaido University
Host in iJURC ONO, Teruo

Research of Surface State for Diamond Quantum Sensor
TOKUDA, Norio, NanoMaterials Research Institute, KANAZAWA UNIVERSITY
Host in iJURC MIZUOCHI, Norikazu

Research of Quantum Technology and Diamond Synthesis for Higher Sensitivity of NV Quantum Sensor
MAKINO, Toshiharu, Advanced Power Electronics Research Center, The National Institute of Advanced Industrial Science and Technology
Host in iJURC MIZUOCHI, Norikazu

STARTING-UP SUBJECTS (ON-DEMAND FROM RELATED COMMUNITIES)

Fabrication of Novel Cell Culture Substrates Using Well-Defined Porous Materials
YOSHIKAWA, Chiaki, National Institute for Materials Science (NIMS), Research Center for Functional Materials
Host in iJURC TSUJII, Yoshinobu I F

Synthesis and Characterization of Raw and Polymerized Asian Lacquer Samples: towards the Development of a Comprehensive Collection of Lacquer Reference Samples for Materials Science and Conservations Studies
BONADUCE, Ilaria, Department of Chemistry and Industrial Chemistry, University of Pisa
Host in iJURC PINCELLA, Francesca I F

Analysis of Novel Transporters for Strigolactones or Their Biosynthetic Intermediates
ZHAO, Yunde, Department of Cell and Developmental Biology, University of California San Diego
Host in iJURC MASHIGUCHI, Kiyoshi I

Precise Synthesis and Viscoelastic Properties of Ring Polymers with High Purity and High Molecular Weight
TAKANO, Atsushi, Department of Molecular and Macromolecular Chemistry, Nagoya University
Host in iJURC MATSUMIYA, Yumi I

Evaluation of Mechanical Properties for Polymer Elastomers with Pseudo-Rotaxane Type Cross-Links
URAKAWA, Osamu, Department of Macromolecular Science, Osaka University
Host in iJURC MATSUMIYA, Yumi I

Involvement of Phospholipids in Cytoplasmic Streaming in Plant Cells
UEDA, Haruko, Osaka University, Department of Macromolecular Science
Host in iJURC AOYAMA, Takashi F

Analysis of Membrane Lipid-Dependent Fermentation Stress Response in Acetic Acid Bacteria
TOYOTAKE, Yosuke, Department of Biotechnology, Ritsumeikan University
Host in iJURC KURIHARA, Tatsuo

Studies on the Structures and Functions of Two Alanine Dehydrogenases in *Geobacillus kaustophilus*
OMORI, Taketo, Department of Biomedical Engineering, Osaka Institute of Technology
Host in iJURC KURIHARA, Tatsuo

Separation of Rare Earth Elements Using Solvent Impregnated Resin Using Surfactants
KURAHASHI, Kensuke, Environmental and Materials Chemistry Course, Osaka Metropolitan University College of Technology
Host in iJURC SOHRIN, Yoshiki

Observation of Photothermal Conversion in 3D Quantum Dot Superlattices Using Pump-Probe Transient Absorption Spectroscopy
GONOME, Hiroki, Graduate School of Science and Engineering, Yamagata University
Host in iJURC SARUYAMA, Masaki

Development of Cooperative Catalysis by Hybridization of Supported Metal Nanoparticles with Metal Oxide Clusters
YAMAZOE, Seiji, Graduate School of Science, Tokyo Metropolitan University
Host in iJURC TERANISHI, Toshiharu

Study and Experiment of the High-Energy Electron Generation by the High-Power Laser-Irradiation to the Stacked CNT Target
MATSUI, Ryutaro, Graduate School of Energy Science, Kyoto University
Host in iJURC TOKITA, Shigeki

EXPANDING SUBJECTS (ON-DEMAND FROM RELATED COMMUNITIES)

Role of PIP5K Genes in Pollen Tube Development
QU, Li-Jia, School of Life Sciences, Peking University
Host in iJURC AOYAMA, Takashi I

Molecular Mechanisms of mRNA Processing Governing 3'UTR Ends by Using Plant as a Model System
JARMOLOWSKI, Artur, Department of Gene Expression, Adam Mickiewicz University, Institute of Molecular Biology and Biotechnology
Host in iJURC TSUGE, Tomohiko I

Exploiting AtMYB60 Regulation for Water Use Efficiency and Drought Resistance in Crops
GALBIATI, Massimo, National Council of Research (CNR), Institute of Agricultural Biology and Biotechnology (IBBA)
Host in iJURC TSUGE, Tomohiko I

Chromatin, Epigenetic and Proteolytic Regulation of RNA Processing in Plant Morphogenesis
RUBIO, Vicente, National Center of Biotechnology (CNB-CSIC), Plant Molecular Genetics Department
Host in iJURC TSUGE, Tomohiko I

Self-Assembling Compounds That Selectively Inhibit Protein Phase-Separation
ZHOU, Lu, School of Pharmacy, Fudan University
Host in iJURC UESUGI, Motonari I

Development of Cancer Vaccine Adjuvants with Optimized Safety Profiles
LI, Yan-Mei, Department of Chemistry, Tsinghua University
Host in iJURC UESUGI, Motonari I F

Red and Near-Infrared Multi-Resonance Thermally Activated Delayed Fluorescence Emitters
BEDNAREK, Christin, Karlsruhe Institute of Technology, Institut of Organic Chemistry, IOC
Host in iJURC KAJI, Hironori I

Construction of Heterologous Protein Secretion System at Low Temperatures by Using Cold-Adapted Microorganisms
DAI, Xianzhu, College of Resources and Environment, Southwest University
Host in iJURC KURIHARA, Tatsuo I F

Structural and Functional Analysis of the Surface Polysaccharides of Outer Membrane Vesicles Released by Bacteria
CORSARO, Maria Michela, Department of Chemical Sciences, University of Naples Federico II
Host in iJURC KURIHARA, Tatsuo I F

High Pressure Synthesis of the Metastable Rare-Earth Nickelates with Ni-Site Substitutions for Synchronizing Their Electronic Phase Transition and Potential Magnetic Transitions
CHEN, Jikun, School of Materials Science and Engineering, University of Science and Technology Beijing, RP China
Host in iJURC SHIMAKAWA, Yuichi I

Formation of Authigenic CaCO₃ on the Ocean Floor below the Compensation Depth
CAI, Pinghe, Department of Marine Chemistry and Geochemistry, Xiamen University
Host in iJURC SOHRIN, Yoshiki I

Fabrication of Nanotopographical Polymer Surfaces for Bactericidal Properties-V
ENDO, Maya, Department of Material Science and Chemical Engineering, Stony Brook University
Host in iJURC TAKENAKA, Mikihiro I F

Interdisciplinary Approach to Nanostructured Materials for Applications
BUCHER, Jean-Pierre, Strasbourg Institute of Material Physics and Chemistry
Host in iJURC TERANISHI, Toshiharu I

Search for Four-Wave-Mixing in the Vacuum - Unveiling Dark Components in the Universe -
HOMMA, Kensuke, Graduate School of Advanced Science and Engineering, Hiroshima University
Host in iJURC TOKITA, Shigeki I

Advanced Oxygen – Mediated Flow Chemistry
THOMAS, Wirth, School of Chemistry, Cardiff University
Host in iJURC NAKAMURA, Masaharu

I

Novel Strategy for Intracellular Delivery of Nanomedicines
PUJALS, Sílvia, Institute for Advanced Chemistry of Catalonia (IQAC)

Host in iJURC FUTAKI, Shiroh

I F

Structural and Functional Analysis of Curvature-Inducing Eptides and Application

ULRICH, S. Anne, Karlsruhe Institute of Technology (KIT), Institute of Organic Chemistry (IOC) and Institute of Biological Interfaces (IBG-2)

Host in iJURC FUTAKI, Shiroh

I F

Molecular Mechanisms for the Inactivation of a Growth Hormone in Rice

HE, Zuhua, Institute of Plant Physiology and Ecology, Chinese Academy of Sciences

Host in iJURC YAMAGUCHI, Shinjiro

I

Cycloparaphenylenes and Chiral Fullerenes for Supramolecular Architectures in Chiroptical Applications

FUCHTER, Matthew J., Imperial College London (ICL), Chemistry

Host in iJURC YAMAGO, Shigeru

I

Chiral Cyclophenylene with an [2.2]Paracyclophane Core

BRÅSE, Stefan, Karlsruhe Institute of Technology, Institut of Biological and Chemical System, IBCS-FMS

Host in iJURC YAMAGO, Shigeru

I

Development of Multi-Dimensional Perovskite Light-Emission and Photo-Response Materials

LIN, Hao-Wu, Department of Materials Science and Engineering, National Tsing Hua University, Taiwan

Host in iJURC WAKAMIYA, Atsushi

I

Correlation of Concentration and Orientation Fluctuations in Mixture of Liquid Crystal/Solvent Isotropic One-Phase State

SHIMADA, Ryoko, Department of Mathematics, Physics and Computer Science, Japan Women's University

Host in iJURC SATO, Takeshi

I F

Real-Time Visualization of Cellular Phase-Separating Proteins

KIKUCHI, Kazuya, Graduate School of Engineering, Osaka University

Host in iJURC UESUGI, Motonari

Remote Control of Cells by Synthetic Small Molecules

NISHIKAWA, Makiya, Faculty of Pharmaceutical Sciences, Tokyo University of Science

Host in iJURC UESUGI, Motonari

Investigation of Donor-Acceptor Molecular Systems by Quantum Chemical Calculations and Atomic-Scale Spectroscopy

KIMURA, Kensuke, Surface and Interface Science Laboratory, RIKEN

Host in iJURC KAJI, Hironori

Functional Analysis and Applications of Extracellular Vesicles Produced by Intestinal Bacteria

YAMASAKI, Shino, Department of Life Science and Biotechnology, Kansai University

Host in iJURC KURIHARA, Tatsuo

F

Electrochemical Control of Metal Oxides and Exploration of Their Functional Properties

TSUCHIYA, Takashi, International Center for Materials Nanoarchitectonics, National Institute for Materials Science

Host in iJURC KAN, Daisuke

Polymer-Brush-Decorated Hybrid Particles as Lubricant Additives
OHNO, Kohji, Osaka Metropolitan University

Host in iJURC TSUJII, Yoshinobu

Manipulation of Three Dimensional Structure of Polymer Monoliths by 3D Printer

MURASE, Hitoki, Kyoritsu Women's University

Host in iJURC TSUJII, Yoshinobu

Room Temperature Operable CdS/CdTe Type II Dimer-Quantum-dot Diode

MAJIMA, Yutaka, Institute for innovative Research, Tokyo Institute of Technology

Host in iJURC TERANISHI, Toshiharu

Measurement of Quasi-Stable Strong Magnetic Field by the Interaction between a High-Power Laser and Structured Medium

KISHIMOTO, Yasuaki, Graduate School of Energy Science, Kyoto University

Host in iJURC TOKITA, Shigeaki

Investigation of Cellular Uptake Mechanism Using Extracellular Vesicles

EGUCHI, Akiko, Department of Gastroenterology and Hepatology, Graduate School of Medicine, Mie University

Host in iJURC FUTAKI, Shiroh

F

Design of Intracellular Delivery Systems for Extracellular Vesicles

NAKASE, Ikuhiko, Department of Biological Chemistry, Graduate School of Science, Osaka Metropolitan University

Host in iJURC FUTAKI, Shiroh

Functional Analysis of Non-Canonical Strigolactones as Plant Hormones and Root-Derived Signals

SETO, Yoshiya, School of Agriculture, Meiji University

Host in iJURC YAMAGUCHI, Shinjiro

Development of Structurally Well-Defined Branched Supramolecular Polymers

HAINO, Takeharu, Graduate School of Advanced Science and Engineering, Hiroshima University

Host in iJURC YAMAGO, Shigeru

SUBJECTS FOCUSING OF JOINT USAGE OF iJURC/ ICR FACILITIES

Microstructural Investigation by Atomic Resolution Transmission Electron Microscopy of Novel Alloys

CHOMSAENG, Natthaphol, Advanced Materials Engineering, Burapha University

Host in iJURC HARUTA, Mitsutaka

I

Electron Energy Loss Spectroscopy and High-Resolution Transmission Electron Microscopy of Novel Functional Materials

CHAIRUANGSRI, Torranin, Industrial Chemistry, Chiang Mai University

Host in iJURC HARUTA, Mitsutaka

I

Plasmon Excitations in Charge-Density-Wave Systems: A Momentum-Dependent Electron-Energy Loss Spectroscopy Investigation

CHU, Ming-Wen, Center for Condensed Matter Sciences, National Taiwan University

Host in iJURC HARUTA, Mitsutaka

I

High-Pressure Synthesis of Transition Metal Oxides with Novel Properties

Jl, Kunlang, Centre for Science at Extreme Conditions and School of Chemistry, University of Edinburgh

Host in iJURC SHIMAKAWA, Yuichi

I

Elucidation of Hydrogen and Helium Retention Behavior in Fusion Materials

MIYAMOTO, Mitsutaka, Interdisciplinary Faculty of Science and Engineering, Shimane University

Host in iJURC HARUTA, Mitsutaka

Nano Structural Analysis of Cs₄PbBr₆/CsPbBr₃ Composite for the Development of a Scintillator for Fast Electron Beam Detection with High Efficiency

SAITO, Hikaru, Institute for Materials Chemistry and Engineering, Kyushu University

Host in iJURC HARUTA, Mitsutaka

Optimization of Laser Irradiation Conditions for High-Quality Ion beam Generation by Laser-Driven Ion Acceleration

KOJIMA, Sadaoki, Kansai Institute for Photon Science, National Institutes for Quantum Science and Technology

Host in iJURC TOKITA, Shigeki

Mass Spectrometry Analysis for the Production of Advanced Chemical Materials from the Efficient Chemical Decomposition Process of Cedar Wood Tissue Structure

HATANO, Osamu, Faculty of Medicine, Nara Medical University

Host in iJURC NAKAMURA, Masaharu

Theoretical Design of Low-Dimensional Silicon Material Embedded in a Flat Two-Dimensional Sheet and Exploration for Operating Principles

TAKAHASHI, Masae, Graduate School of Science, Tohoku University

Host in iJURC MIZUHATA, Yoshiyuki

F

SUBJECTS ENCOURAGING JOINT PROGRAM

Determine the Three-Dimensional Structure of ¹³C=¹⁸O Labeled α -Synuclein(61-95) in the Langmuir-Blodgett Film and Supported Phospholipid Bilayer by MAIRS2

WANG, Chengshan, Department of Chemistry, Middle Tennessee State University

Host in iJURC HASEGAWA, Takeshi

I

High-Efficacy Protein Chemical Synthesis

HOJO, Hironobu, Institute for Protein Research, Osaka University

Host in iJURC FUTAKI, Shiroh

I

Modulation of In-Cell Protein-Protein Interactions Using Mid-Sized Peptides

TAMAMURA, Hirokazu, Institute of Biomaterials and Bioengineering (IBB-TMDU), Tokyo Medical and Dental University

Host in iJURC FUTAKI, Shiroh

I

The 17th International Workshop for East Asian Young Rheologists

INOUE, Tadashi, Department of Macromolecular Science, Osaka University

Host in iJURC MATSUMIYA, Yumi

I

A novel Interdisciplinary Approach to Cancer Metabolism Research by Solid State Nuclear Magnetic Resonance Spectroscopy
ITO, Takahiro, Institute for Life and Medical Sciences, Kyoto University

Host in iJURC KAJI, Hironori

iJURC Publications (Selected Examples)

(until 31 May 2023)

Field-Free Superconducting Diode Effect in Noncentrosymmetric Superconductor/Ferromagnet Multilayers

Narita, H.; Ishizuka, J.; Kawarazaki, R.; Kan, D.; Shiota, Y.; Moriyama, T.; Shimakawa, Y.; Ognev, A. V.; Samardak, A. S.; Yanase, Y.; Ono, T., *Nat. Nanotechnol.*, **17**, 823-828 (2022).

Abstract

The diode effect is fundamental to electronic devices and is widely used in rectifiers and a.c.–d.c. converters. At low temperatures, however, conventional semiconductor diodes possess a high resistivity, which yields energy loss and heating during operation. The superconducting diode effect (SDE), which relies on broken inversion symmetry in a superconductor, may mitigate this obstacle: in one direction, a zero-resistance supercurrent can flow through the diode, but for the opposite direction of current flow, the device enters the normal state with ohmic resistance. The application of a magnetic field can induce SDE in Nb/V/Ta superlattices with a polar structure, in superconducting devices with asymmetric patterning of pinning centres or in superconductor/ferromagnet hybrid devices with induced vortices. The need for an external magnetic field limits their practical application. Recently, a field-free SDE was observed in a NbSe₂/Nb₃Br₈/NbSe₂ junction; it originates from asymmetric Josephson tunnelling that is induced by the Nb₃Br₈ barrier and the associated NbSe₂/Nb₃Br₈ interfaces. Here, we present another implementation of zero-field SDE using noncentrosymmetric [Nb/V/Co/V/Ta]₂₀ multilayers. The magnetic layers provide the necessary symmetry breaking, and we can tune the SDE by adjusting the structural parameters, such as the constituent elements, film thickness, stacking order and number of repetitions. We control the polarity of the SDE through the magnetization direction of the ferromagnetic layers. Artificially stacked structures, such as the one used in this work, are of particular interest as they are compatible with microfabrication techniques and can be integrated with devices such as Josephson junctions. Energy-loss-free SDEs as presented in this work may therefore enable novel non-volatile memories and logic circuits with ultralow power consumption.

Synergistic Surface Modification of Tin–Lead Perovskite Solar Cells

Hu, S.; Zhao, P.; Nakano, K.; Oliver, R. D. J.; Pascual, J.; Smith, J. A.; Yamada, T.; Truong, M. A.; Murdey, R.; Shioya, N.; Hasegawa, T.; Ehara, M.; Johnston, M. B.; Tajima, K.; Kanemitsu, Y.; Snaith, H. J.; Wakamiya, A., *Adv. Mater.*, **35**(9), 2208320 (2023).

Abstract

Interfaces in thin-film photovoltaics play a pivotal role in determining device efficiency and longevity. In this work, the top surface treatment of mixed tin–lead (≈ 1.26 eV) halide perovskite films for p–i–n solar cells is studied. Charge extraction is promoted by treating the perovskite surface with piperazine. This compound reacts with the organic cations at the perovskite surface, modifying the surface structure and tuning the interfacial energy level alignment. In addition, the combined treatment with C₆₀ pyrrolidine tris-acid (CPTA) reduces hysteresis and leads to efficiencies up to 22.7%, with open-circuit voltage values reaching 0.90 V, $\approx 92\%$ of the radiative limit for the bandgap of this material. The modified cells also show superior stability, with unencapsulated cells retaining 96% of their initial efficiency after >2000 h of storage in N₂ and encapsulated cells retaining 90% efficiency after >450 h of storage in air. Intriguingly, CPTA preferentially binds to Sn²⁺ sites at film surface over Pb²⁺ due to the energetically favored exposure of the former, according to first-principles calculations. This work provides new insights into the surface

chemistry of perovskite films in terms of their structural, electronic, and defect characteristics and this knowledge is used to fabricate state-of-the-art solar cells.

LiNbO₃-Type Polar Antiferromagnet InVO₃ Synthesized under High-Pressure Conditions

Tan, Z.; Lussier, J. A.; Yamada, T.; Xu, Y.; Saito, T.; Goto, M.; Kosugi, Y.; Vrublevskiy, D.; Kanemitsu, Y.; Bieringer, M.; Shimakawa, Y., *Angew. Chem. Int. Ed.*, **61**(25), e202203669 (2022).

Abstract

The ambient pressure cation disordered InVO₃ bixbyite has been predicted to form a GdFeO₃-type perovskite phase under high pressure and high temperature. Contrary to the expectation, InVO₃ was found to crystallize in the polar LiNbO₃-type structure with a calculated spontaneous polarization as large as 74 $\mu\text{C cm}^{-2}$. Antiferromagnetic coupling of V³⁺ magnetic moments and a cooperative magnetic ground state below about 10 K coupled with a polar structure suggest an intriguing ground state of the novel LiNbO₃-type high-pressure InVO₃ structure.

Nitrogen Reduction by the Fe Sites of Synthetic [Mo₃S₄Fe] Cubes

Ohki, Y.; Munakata, K.; Matsuoka, Y.; Hara, R.; Kachi, M.; Uchida, K.; Tada, M.; Cramer, R. E.; Sameera, W. M. C.; Takayama, T.; Sakai, Y.; Kuriyama, S.; Nishibayashi, Y.; Tanifuji, K., *Nature*, **607**, 86-90 (2022).

Abstract

N₂ fixation by Nature is performed by nitrogenase, which employs a unique transition metal-sulfur-carbon cluster as its active-site cofactor ([(*R*-homocitrate)MoFe₇S₉C], FeMoco). Whereas synthetic counterparts of FeMoco, metal-sulfur clusters, have displayed binding of N₂ in a few examples, the reduction of N₂ by this class of compounds has been unknown. Here we show that the Fe atoms in our [Cp^R₃Mo₃S₄Fe] cubes (Cp^R = C₅Me₅, C₅Me₄SiMe₃, and C₅Me₄SiEt₃) capture an N₂ molecule and catalyze N₂ silylation to form N(SiMe₃)₃ under treatment with excess Na and Me₃SiCl. These results exemplify the first catalytic N₂ reduction by a synthetic metal-sulfur cluster with an Fe center supported only by S ligands. This work demonstrates the N₂-reducing capability of Fe atoms in a S-rich environment, which Nature has selected to accomplish a similar purpose.

“Mamonoviridae”, a Proposed New Family of the Phylum Nucleocytoviricota

Zhang, R.; Takemura, M.; Murata, K.; Ogata, H., *Arch. Virol.*, **168**, 80 (2023).

Abstract*

Acanthamoeba castellanii medusavirus J1 is a giant virus that was isolated from a hot spring in Japan in 2019. Recently, a close relative of this virus, named medusavirus stheno T3, was isolated in Japan. Here, we describe their morphological, genomic, and gene content similarities and also propose to create a new family, “Mamonoviridae”, a new genus, “Medusavirus”, and two species, “Medusavirus medusae” and “Medusavirus sthenus”, to classify these two viruses within the phylum Nucleocytoviricota.

*Permission to use this abstract was obtained from Springer Nature by Hiroyuki Ogata.