

Summit of Materials Science (SMS) 2024 and Global Institute for Materials Research Tohoku (GIMRT) User Meeting 2024, November 27-28, 2024

SMS2024 was successfully held at IMR auditorium with almost 300 participants (including online participants) in 2 days from November 27 to 28.

The conference started with welcome greetings by Prof. Rie Umetsu, Deputy Director of IMR, and Prof. Takahiko Sasaki, Director of IMR.

The conference was divided into 7 fields, “Strong Correlation and Topology”, “Energy Materials”, “Computational Materials Science and Informatics”, “Structural Materials”, “Nuclear Materials”, “Frontier in Metal and New Materials”, and “Functional Magnetic, Electronic, and Semiconducting Materials”.

The total number of speakers this time was 27, of which 10 were invited, including 8 from overseas. The venue was full, a hot discussion was exchanged at every field.

The poster session was held on the evening of the 1st day, and researchers and students presented their recent research topics.

The discussion was overflowing until the next program Mixer, a lively discussion ensued.



Summit of Materials Science 2024 and GIMRT User Meeting 2024

Date: November 27-28, 2024

Venue: IMR Auditorium, Tohoku University (Onsite)

Day 1: Nov. 27

Opening					
	10:00	10:05	Rie Umetsu	IMR	Opening
	10:05	10:20	Takahiko Sasaki	IMR	Welcome Address

Number	Time		Name	Affiliation	Title
Session A Strong Correlation and Topology (Chair: Yusuke Nomura, IMR)					
A-1	10:20	10:50	Roser Maria Valentí	Goethe University Frankfurt	Strategies to Design Quantum Materials with Exotic Properties
A-2	10:50	11:20	Yoshinori Onose	IMR	Chirality Control and Detection in Metallic Helimagnets
A-3	11:20	11:35	Yoshihiro Okamura	The University of Tokyo	Magneto-Optical Study on Topological Magnets
A-4	11:35	11:50	Takuya Aoyama	Hiroshima University	Piezomagnetism in Antiferromagnets with Broken Time-Reversal Symmetry
A-5	11:50	12:20	Masaki Fujita	IMR	Neutron Scattering Study on Spin Excitations Coupled with Charge and Lattice Dynamics
	12:20	13:50	Lunch Break (Photo Session @1st Building Lobby)		
Session B Energy Materials (Chair: Hidemi Kato, IMR)					
B-1	13:50	14:20	Tetsuya Uda	Kyoto University	Lithium-Ion Battery Recycling through Comminution in Water in Inert Atmosphere
B-2	14:20	14:50	Andreas Züttel	EPFL	Power Plant Units for CO ₂ Neutral Energy Security
B-3	14:50	15:20	Tetsu Ichitsubo	IMR	Development of Metal-Anode Battery and Dual Ion Battery Systems with Multivalent Cation
B-4	15:20	15:50	Kozo Fujiwara	IMR	Fundamental and Applied Research on Crystal Growth
	15:50	16:00	Break		
Session C Computational Materials Science and Informatics (Chair: Momoji Kubo, IMR)					
C-1	16:00	16:30	Maria Clelia Righi	University of Bologna	Advancing Solid Interface and Lubricants by First Principles
C-2	16:30	17:00	Emi Minamitani	Osaka University	Elucidating Structure-Property Correlation in Amorphous Materials by Persistent Homology
C-3	17:00	17:30	Yu Kumagai	IMR	Defects in Semiconductors: A First-Principles Investigation
C-4	17:30	17:45	Kazushi Fujimoto	Kansai University	Mechanical Response Mechanisms during Compression Fracture of Polymer Particles
	17:45	19:00	Poster Session @2nd Building Lobby		
	19:00	20:30	Mixer @Lounge		

Day 2: Nov. 28

Number	Time		Name	Affiliation	Title
Session D Structural Materials (Chair: Kenta Yamanaka, IMR)					
D-1	9:30	10:00	Young-Kook Lee	Yonsei University	Hydrogen Embrittlement of High-Strength Martensitic Steel
D-2	10:00	10:30	Tadashi Furuhashi	IMR	Alloying Effects on Microstructure Development in High Strength Steels – from Bulk to Surface
D-3	10:30	11:00	Martin Luckabauer	University of Twente	Tailoring Omega Transformation Kinetics in Beta Titanium Alloys for Biomedical Applications
	11:00	11:10	Break		
Session E Nuclear Materials (Chair: Dai Aoki, IMR)					
E-1	11:10	11:40	Jean-Pascal Brison	CEA-Grenoble	Field and Pressure Tuning of the Superconducting Pairing Mechanisms in UTe ₂
E-2	11:40	12:10	Ryuta Kasada	IMR	Redesigning, Restructuring and Reviving Nuclear Materials Research in Japan towards a New Concept of Irradiation 3.0
E-3	12:10	12:25	Hiroyuki Kazama	Osaka University	Gas-Phase Oxidation of Actinide Ions in Triple Quadrupole Inductively Coupled Plasma Mass Spectrometry
E-4	12:25	12:40	Sayuri Takatori	Okayama University	Spectroscopy of Thorium-229 Nuclear Clock Transition in ²²⁹ Th:CaF ₂ Crystal
	12:40	13:40	Lunch Break		
Session F Frontier in Metal and New Materials (Chair: Eiji Akiyama, IMR)					
F-1	13:40	14:10	Eun Soo Park	Seoul National University	High Entropy Alloy Foam: Open a New Era of Thermal Protection Utilizing Metals
F-2	14:10	14:40	Hidemi Kato	IMR	Dissimilar Joining of Immiscible Metals by Eutectic Melting Induced Liquid Metal Dealloying
F-3	14:40	15:10	Hitoshi Miyasaka	IMR	Chemo-Switchable MOF Magnets
	15:10	15:20	Break		
Session G Functional Magnetic, Electronic and Semiconducting Materials (Chair: Yoshinori Onose, IMR)					
G-1	15:20	15:50	Kiyonori Suzuki	Monash University	Ultra-Low Core Loss of Nanocrystalline Soft Magnetic Alloys Brought about by Near-Zero Magnetostriction
G-2	15:50	16:20	Takeshi Seki	IMR	Control of Magneto-Elasticity in Magnetic Thin Films
G-3	16:20	16:35	Takamasa Hirai	NIMS	Elastocaloric Kirigami Temperature Modulator
G-4	16:35	16:50	Yoshitaro Nose	Kyoto University	Processing for Group IV Chalcogenides with 2D Structure Based on Thermodynamics
	16:50	17:00	Closing		

Poster Session

Number	Name	Affiliation	Title
PS01	Mayurkumar Ashwinbhai Makhesana	Nirma University	Synthesis and Characterization of Metallic Nanoparticles via Laser Ablation Synthesis in Solution and Aerosol Jet Printing
PS02	Anna Kosogor	Institute of Magnetism NASU and MESU	Magnetic Properties, Phase Diagram and Low-Temperature Specific Heat of $\text{Ni}_{50}\text{Mn}_{50-x}\text{Sb}_x$ Alloys
PS03	Yoichi Ikeda	IMR	Current Status of a Triple-Axis Neutron Spectrometer 6G-TOPAN
PS04	Shigeru Okada	Kanagawa University	Syntheses and Properties of Single-Phase RuB_2 Material by Arc Melt Method
PS05	Yulin Xie	IMR	High-Throughput Investigation of Cr-N Cluster Formation in Fe-35Ni-Cr System during Low-Temperature Nitriding
PS06	Taiki Miura	IMR	Effect of Ligament Crystal Ordering on Porous Structure Formation and Coarsening in Liquid Metal Dealloying
PS07	Toyoto Sato	IMR	Hydrogen Absorption Reactions and Crystal Structure of $(\text{Y}, \text{Mg})\text{Co}_3$
PS08	Kenji Yoshino	University of Miyazaki	Development of Low-Temperature Non-Vacuum Growth of ZnO Protective Film for Mg-Ion Battery
PS09	Kaoru Kouzu	Kokushikan University	Syntheses and Its Properties of $R(\text{Al}, \text{Mo})\text{B}_4$ (R =Rare Earth) Compounds by High-Temperature Al Melt Method
PS10	Takeshi Hagiwara	Kanagawa University	Synthesis of AlMgB_{14} Crystal Using Magnesium Fluoride by Al-Self Flux and Its Physicochemical Properties
PS11	Hong-Fei Zhao	IMR	Search for Short-Range Ordering in Medium-Entropy Alloys (Mn-Co-Ni and Cr-Co-Ni) via Neutron Scattering
PS12	Zaskia Alifia	University of Toyama	Nanoparticle Synthesis of BiVO_4/Ag for Enhanced Dye Photodegradation Illuminated by Visible Light
PS13	Hiroya Ishii	IMR	Effects of Composition and Processing on the Microstructures, Mechanical Properties and Corrosion Behavior of Biodegradable Fe-Mn Alloys
PS14	Takumi Yamazaki	IMR	Figure of Merit of Transverse Thermoelectric Conversion for Magnetic Thin Film Measured by All-in-One Evaluation Method
PS15	Hidetoshi Masuda	IMR	Nonreciprocal Electronic Transport Induced by Current-Induced Deformation of Helimagnetic Structure in YMn_6Sn_6
PS16	Hsiao-Yi Chen	IMR	Development of an Ab Initio Method for Non-Coplanar Chiral Magnets and Response Properties
PS17	Rico Pohle	IMR	Spin Nematics Meet Spin Liquids: Exotic Phases in the Spin-1 Bilinear-Biquadratic Model with Kitaev Interactions
PS18	Yoichi Nii	IMR	Gigahertz Topological Surface Acoustic Wave on a Nano-Scaled Honeycomb Phononic Crystal
PS19	Hiroshi Kakinuma	IMR	Microscopic Imaging of Hydrogen Diffusion in Metals Using Polyaniline
PS20	Junyi Luo	IMR	Anisotropy of Critical Current Density Properties of the High-Performance SS/Ag-Sheathed $\text{Ba}_{1-x}\text{K}_x\text{Fe}_2\text{As}_2$ Tapes
PS21	Chanhyeon Lee	IMR	Emergent $\sqrt{3} \times \sqrt{3}$ Type Gapless Quantum Spin Liquid in Spin – 1/2 Random Kagome Antiferromagnet $\text{YCu}_3(\text{OD})_{6.5}\text{Br}_{2.5}$
PS22	Yuji Seki	Keio University	Theoretical Calculation of Transport Coefficients in Infinite-Layer Nickelates
PS23	Koji Inoue	IMR	Effects of P on Formation and Growth of Mn-Ni-Si Clusters in Low-Cu Reactor Pressure Vessel Steel
PS24	Haruka Yoshino	IMR	Ultrafast Luminescence Sensing with Selective Adsorption of Carbon Disulfide in an Au(I) Metal-Organic Framework

Number	Name	Affiliation	Title
PS25	Satoshi Iguchi	IMR	Magneto-Optical Detection of Altermagnetism in Organic Antiferromagnet
PS26	Oleksandr Prokhnenko	Helmholtz-Zentrum Berlin	Magnetic Order and Spin Dynamics in Natural Mineral Brochantite $\text{Cu}_4\text{SO}_4(\text{OH})_6$
PS27	Qingxin Liu	IMR	Dynamical Spin Reordering in a Hybrid Layered Ferrimagnet with Biferrocenium Radicals
PS28	Ke Ji	IMR	Intra-Lattice Hydrogen Bonds-Related Charge Manipulations Associated with Guest Removal in Charge Transferred Layered Metal-Organic Frameworks
PS29	Tetsuya Furukawa	IMR	Thermoelectric Properties of an Ambient-Pressure Organic Dirac Electron System $\alpha\text{-(BETS)}_2\text{I}_3$
PS30	Ali Md. Arafat	Tohoku University	High-Resolution Spatial Mapping of π -Radical Spin States in Single-Molecule Magnets with Electron Spin Resonance
PS31	Tsutomu Nojima	IMR	Research on Polar Superconductivity in Ion-Gated SrTiO_3
PS32	Yixin Su	IMR	Reactive Molecular Dynamics Simulations Revealing the Impact of Carbon Nanotube (CNT) Volume Fraction on the Mechanical Properties of SiC/CNT Composites
PS33	Muhammad Khalish Nuryadin	IMR	Disorder Effect Induced by X-ray Irradiation on a Monomer Mott Insulator $(\text{BEDT-TTF})\text{Cu}[\text{N}(\text{CN})_2]_2$
PS34	Shiori Sugiura	IMR	Disorder Effect to the High-Field FFLO Phase in Layered Organic Superconductor $\kappa\text{-(BEDT-TTF)}_2\text{Cu}(\text{NCS})_2$
PS35	Yuta Kimoto	IMR	Observation of Spin Motive Force and Conduction Noise in a Sliding Helimagnetic Structure
PS36	Ryo Kawakami	University of Tsukuba	Synthesis and Characterization of Polyaniline Type Metal-Doped Magnetic Conjugated Polymers