

List of selected projects for General Collaborative Research Project 2024, IFS, Tohoku University (as 19th April, 2024)

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J24I001	Low-Speed Aeroelastic Buffeting of Tail Wings: Theory and Analysis	Keisuke Otsuka	Tohoku University	Yoshiaki Abe	Tohoku University
J24I002	Attenuation Effect of Shock Environment in Supersonic Flow using the Soft Body	Kazutaka Kitagawa	Aichi Institute of Technology	Kiyonobu Ohtani	Tohoku University
J24I003	Development of Energy Conversion Devices using Magnesium-based Semiconductor Materials	Haruhiko Udono	Ibaraki University	Daisuke Ohori	Tohoku University
J24I005	Mechanism of YSZ Phase Transition and Ionic Conductivity	Yuting Guo	Kyoto University	Taku Ohara	Tohoku University
J24I006	Dynamics of Shockwave and Transport of Ballistic Blocks in a Volcanic Eruption	Kae Tsunematsu	Yamagata University	Kiyonobu Ohtani	Tohoku University
J24I007	A Study of Heat Stroke Dynamics by Combined Analysis of Radiation and Convection	Hiroki Gonome	Yamagata University	Junnosuke Okajima	Tohoku University
J24I008	Evaluation of Wall Thinning with Thick Insulator Based on Pulsed Eddy Current Testing Method using Novel Signal Processing Way	Shejuan Xie	Xi'an Jiaotong University	Tetsuya Uchimoto	Tohoku University
J24I009	Experimental Study of Shielding Performance of Thermally-cured Inflatable Structures	Kanjuro Makihara	Tohoku University	Kiyonobu Ohtani	Tohoku University
J24I010	Investigation of Aerodynamic Noise Mechanism of Multi-directional Wing of Aero-train and Active Flow Control for Noise Reduction	Chenguang Lai	Chongqing University of Technology	Shigeru Obayashi	Tohoku University
J24I011	Study on Flow Interaction Effect to Rotor Perfomace of Multirotors	Hikaru Otsuka	Kanazawa University	Hiroki Nagai	Tohoku University
J24I012	Study on Flow Strucutre around Rotor Blade with Turbulators in Low Reynolds Numbers	Hikaru Otsuka	Kanazawa University	Tsubasa Ikami	Tohoku University
J24I013	Advection-diffusion Solution of the Internal MRI Environment of a Non-magnetic Fluid Control Device for Analysis of Brain Function in Response to Olfactory Stimulation.	Yusuke Inoue	Asahikawa Medical University	Junnosuke Okajima	Tohoku University
J24I014	Impact Compressive Deformation Behavior of Artificial Pumice for Reinforcement of Shelter against Ballistic Ejecta	Kohei Tateyama	Muroran Institute of Technology	Kiyonobu Ohtani	Tohoku University
J24I015	Experiment and Simulation of a Rotaitng Hollow Cylinder in Flight	Katsuya Hirata	Doshisha University	Jun Ishimoto	Tohoku University
J24I016	Reproducing Large Degree-of-freedom Fields and Developing Actuator Placement Optimization Algorithm toward Development of Weather Modification Technology	Taku Nonomura	Nagoya University	Shigeru Obayashi	Tohoku University
J24I017	The Investigations of the Length and Time Scales Related to Turbulence Interaction with a Long Rise-time Sonic Boom Pressure Signature	Takahiro Ukai	Osaka Institute of Technology	Kiyonobu Ohtani	Tohoku University
J24I018	Supercritical Real-Fluid Oxidations of Ammonia by Using the SP-Virial Thoery	Hao Zhao	Peking University	Hisashi Nakamura	Tohoku University
J24I019	Emulating Atherosclerotic Conditions on an 'Organ-on-a-Chip' Device	Eugenia Corvera Poire	National Autonomous University of Mexico	Kenichi Funamoto	Tohoku University
J24I020	Exploring the Effects of Shear Stress Magnitude and Variation on Endothelial Injury: from Current Evidence to in Vitro Experiment of Cellular Responses	Mingzi Zhang	Macquarie University	Makoto Ohta	Tohoku University
J24I021	Development of Novel Gate Stack Process for Advanced Node MOSFETs	Yukinori Morita	National Institute of Advanced Industrial Science and Technology (AIST)	Kazuhiko Endo	Tohoku University
J24I022	Experimental and Kinetics Modeling Study of Tri-Methyl-Phosphate (TMP) and Bis(2,2,2-trifluoroethyl) methylphosphonate Combustion –Toward P-Containing Fire Suppressants for Lithium-Ion Battery Electrolytes	Olivier Mathieu	Texas A&M University	Hisashi Nakamura	Tohoku University
J24I023	Numerical Exploration of Plasma-Induced Charge and Electric Field-Induced Transport Transformations in Biological Membranes	Satoshi Uchida	Tokyo Metropolitan University	Takehiko Sato	Tohoku University
J24I024	Elucidation of Viscous Drag Reduction Mechanism by Riblet Processing	Akira Oyama	Institute of Space and Astronautical Science (JAXA)	Aiko Yakeno	Tohoku University
J24I025	Flow Control around Wing by Sparse Processing PIV and Plasma Actuator	Taku Nonomura	Nagoya University	Yoshiaki Abe	Tohoku University
J24I027	Study on Conceptual Desing of an Aircraft Fueled with Ammonia	Hisashi Nakamura	Tohoku University	Shimokuri Daisuke	Hiroshima University
J24I028	Numerical Prediction of Heat Flux of Cartesian Mesh CFD in Supersonic/Hypersonic Flows	Daisuke Sasaki	Osaka Metropolitan University	Shigeru Obayashi	Tohoku University
J24I029	Computational and Experimental Study of Unsteady Flowfield around Flexible-membrane Wing at Low Reynolds Number toward Mars Airplane	Daisuke Sasaki	Osaka Metropolitan University	Hiroki Nagai	Tohoku University
J24I030	Statistical Learning Approaches for Data Mining in Multi-objective Aerodynamic Design Optimization	Pramudita Satria Palar	Bandung Institute of Technology	Shigeru Obayashi	Tohoku University
J24I031	Numerical Study on Energy and Scalar Transfer in Turubulence with Non-equilibrium Features	Yasumasa Ito	Nagoya University	Yuji Hattori	Tohoku University
J24I032	Study on Micro-scale Evaporation for Heat Transfer Enhancement	Junnosuke Okajima	Tohoku University	Peter Stephan	Technical University of Darmstadt
J24I033	Combination of Atmospheric Pressure Plasma with Mist Generated by Condensation of Water Vapor in Pressurized Air	Yun-Chien Cheng	National Yang Ming Chiao Tung University	Takehiko Sato	Tohoku University
J24I034	An Analysis of Self-organization of Three Dimensional Turbulent Vortical Structure Derived from Interaction between Vortical Flow and Bundle of Vorticity Lines	Katsuyuki Nakayama	Aichi Institute of Technology	Yuji Hattori	Tohoku University
J24I035	Blood Flow Analysis of Aorta-left Ventricle System with Aortic Valve	Suguru Miyauchi	University of Miyazaki	Kenichi Funamoto	Tohoku University

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J24I038	Generation of High-speed Ultrafine Droplets and Droplets Characteristics	Takehiko Sato	Tohoku University	Seiji Kanazawa	Oita University
J24I039	Generation of Charged Cavitation Bubbles and the Characteristics	Takehiko Sato	Tohoku University	Farhat Mohamed	Ecole Polytechnique Federale de Lausanne (EPFL)
J24I041	Numerical Simulation of Mass Transfer in Supercritical Carbon Dioxide	Yuki Kanda	Tohoku University	Yingxue Hu	Xi'an Jiaotong University
J24I042	Effect of Charge Distribution on the Plasma-induced Fine Bubble Dynamics	Liu Siwei	Tohoku University	Supponen Outi	ETH
J24I044	Digital Twin R&D of Flexible Membrane Wing with Wing Veins by Wind Tunnel Test and Numerical Simulation	Tsubasa Ikami	Tohoku University	Masahiro Kanazaki	Tokyo Metropolitan University
J24I045	Fundamental Study of Weak Radiation Behind Air Shock Waves	Masato Funatsu	Gunma University	Kiyonobu Ohtani	Tohoku University
J24I046	Transient Structural Analysis of the Interaction of Stiffness and Compliance between Aorta and Carotid Arteries by Performing Numerical Simulations	Yujie Li	Torrens University Australia	Makoto Ohta	Tohoku University
J24I048	Three-dimensional Numerical Simulation on Gas Pore Inside Liquid Metal Droplet	Joe Yoshikawa	Industrial Technology Institute, Miyagi Prefectural Government	Hidemasa Takana	Tohoku University
J24I049	Molecular Simulation of CO ₂ Permeation through Microalgae Lipid Membrane	Takuya Mabuchi	Tohoku University	Fayza Yulia	Pertamina University
J24I050	Research on Turbulence Models that Reproduce Spatially and Temporally Nonequilibrium Flows	Aiko Yakeno	Tohoku University	Richard Sandberg	The University of Melbourne
J24I051	Elucidation of Taylor-Couette Flow Field under Electromagnetic Fields and Its Application to Energy Conversion Devices	Hirokazu Kobayashi	Keio University	Hidemasa Takana	Tohoku University
J24I052	Characterization of Particulate Morphology Generated from Li-Ion Battery (LiB) Combustion Processes	Samuel L. Manzello	Reax Engineering	Kaoru Maruta	Tohoku University
J24I053	Development of Phonon Propagation in Quantum Nano-structures by using High-sensitivity Detection of the Surface Displacement	Atsuhiko Fukuyama	University of Miyazaki	Daisuke Ohori	Tohoku University
J24I054	Molecular-scale Design of Flame Retardant Polymer Materials by using an Integrated Scheme of Quantum Chemistry and Molecular Simulation	Zhao Yinbo	Tongji University	Gota Kikugawa	Tohoku University
J24I055	Elucidation of Unsteady Flow Fields Induced by Rotating Cylinder with Fins and Optimization of Fin Shape Improving Magnus Wind Turbine Performance	Hiroaki Hasegawa	Utsunomiya University	Shigeru Obayashi	Tohoku University
J24I056	Development of a Plasma-liquid Interfacial Reactor on a Microfluidic Chip	Hiroyuki Yoshiki	National Institute of Technology, Sendai College	Takehiko Sato	Tohoku University
J24I057	Investigation of Device Fabrication Techniques to Improve Nano-memory Characteristics	Takeo Ohno	Oita University	Kazuhiko Endo	Tohoku University
J24I059	Analysis of Plant Seed Radiated of Various Plasma	Hayashi Neisei	The Graduate School for the Creation of New Photonics Industries	Daisuke Ohori	Tohoku University
J24I060	Harnessing Machine Learning for Enhancing Fluid Mechanics Understanding in Riblet Surfaces	Lavi Rizki Zuhail	Institut Teknologi Bandung	Aiko Yakeno	Tohoku University
J24I061	Study of Turbulent Transition and Statistical Properties of Turbulence of Destabilized Helical Vortex	Yuji Hattori	Tohoku University	Ivan Delbende	Sorbonne Universite
J24I062	Three-dimensional Density Measurement of Wake Region Behind Re-entry Capsule Model to Clarify the Mechanism of Its Dynamic Instability	Masanori Ota	Chiba University	Hiroki Nagai	Tohoku University
J24I063	Control of Transonic / High-speed Boundary Layer Flows	Yuji Hattori	Tohoku University	Adrian Sescu	Mississippi State University
J24I064	Development of Compressive Sensing Technique for Complex Fluid Phenomena	Yu Matsuda	Waseda University	Hiroki Nagai	Tohoku University
J24I065	Pathobiology-Hemodynamics Interaction in Aneurysms Genesis, Growth and Rupture	Muhamed Albadawi	Alexandria University (Egypt) and Egypt-Japan university of science and technology	Makoto Ohta	Tohoku University
J24I066	Analysis of Aerodynamic Forces and Flow Field on a Roadable Aircraft against Crosswind during Landing	Seiichi Morizawa	National Institute of Technology, Okinawa College	Shigeru Obayashi	Tohoku University
J24I067	Synthesis of Sulfonated Carbon Catalysts using Combination Process of Plasma in Liquid and Ultrasonic Cavitation	Nozomi Takeuchi	Tokyo Institute of Technology	Hidemasa Takana	Tohoku University
J24I068	A Novel Research for Performance Optimization of Microchannel Heat Exchangers Using Fins, Magnetic Field, and Hybrid Nanofluids	Hidemasa Takana	Tohoku University	Shabbir Ahmad	Muhammad Nawaz Sharif University
J24I070	A Study on Nano-scale Interfacial Phenomena between Surface-modified Nanoparticle and Dispersed Media	Masaki Kubo	Tohoku University	Atsuki Komiya	Tohoku University
J24I071	Experimental Investigation on Shock Wave Development in Opaque Medium	Toshiharu Mizukaki	Tokai University	Kiyonobu Ohtani	Tohoku University
J24I072	Analysis of Power Generation from Ammonia based Fuel in Solid Oxide Fuel Cells	Jeongmin Ahn	Syracuse University	Hisashi Nakamura	Tohoku University
J24I073	Sonic-boom Surrogate Model Integration in a Chemistry-climate Model	Hiroshi Yamashita	Deutsches Zentrum für Luft- und Raumfahrt (DLR)	Shigeru Obayashi	Tohoku University
J24I075	Numerical, Experimental and Optimization Analysis of a Novel Solar Concentrating Photovoltaic Thermal (CPVT) System and Investigation of Phase Change Heat Transfer on the Working Fluid for Performance Advancement	Abid USTAUGLU	Bartın University	Junnosuke Okajima	Tohoku University
J24I076	Numerical Study for Space Navigation System with High-speed Ionized Flow	Masayuki Takahashi	Tohoku University	Hiroki Nagai	Tohoku University
J24I077	Development of Sub-10 μm micro-LED	Seiji Samukawa	National Yang Ming Chiao Tung University	Daisuke Ohori	Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J24I078	Investigation of Organophosphorus Flame Retardants: Enhancing Fire Safety in Materials through Advanced Experimental and Computational Techniques	Li Yang	Northwestern Polytechnical University	Hisashi Nakamura	Tohoku University
J24I079	Development of Transparent Ultrasound Phantom Material: Sound Velocity Study	Muhammad Shiddiq Sayyid Hashuro	Bandung Institute of Technology	Makoto Ohta	Tohoku University
J24I080	Numerical Investigation of the Flow Field on the Railway at Naha Airport	Seiichiro Morizawa	National Institute of Technology, Okinawa College	Aiko Yakeno	Tohoku University
J24I081	Combined in Situ & Ex Situ, Multi-scale Stress Measurements in Crystalline Geothermal Reservoirs	Xiaodong Ma	University of Science and Technology of China	Yusuke Mukuhira	Tohoku University
J24I082	Research on the Transition Mechanism on the Surface of High-speed Flying Vehicle and a Turbulence Model that Reproduces it	Aiko Yakeno	Tohoku University	Jens Fransson	KTH Royal Institute of Technology
J24I083	Research on the Antibacterial Effect of Ag- and Cu-containing Carbon Films using the Self-exudation Effect of Contained Metal Components	Minoru Goto	National Institute of Technology, Ube College	Tetsuya Uchimoto	Tohoku University
J24I084	Free-Motion Wind Tunnel Testing of a Lifting Atmospheric Entry Capsule	Kazuyuki Ueno	Iwate University	Hiroki Nagai	Tohoku University
J24I086	3D Human Blood-Brain Barrier in Brain Diseases on a Chip	Masanori Tachikawa	Tokushima University	Kenichi Funamoto	Tohoku University
J24I087	Hemodynamics at Internal Carotid Artery with Aneurysm in Elastic Full-scale Patient Specific Model	Nadia Shaira Binti Shafii	Universiti Teknologi Malaysia	Makoto Ohta	Tohoku University
J24I089	Advancement of Measurement Technique for Oxygen Enriched Flame under High Pressure	Akihiro Hayakawa	Tohoku University	Shinji Nakaya	The University of Tokyo
J24I090	Precise Measurement of the Effect of Deceleration on the Drag Coefficient	Takamasa Kikuchi	Nihon University	Kiyonobu Ohtani	Tohoku University
J24I091	Fabrication of Nanofibrous Layer Covered Stents	Angela Jedlovsky-Hajdu	Semmelweis University	Makoto Ohta	Tohoku University
J24I092	On the Reduction of the Flow-induced Noise using Bio-inspired Porous Material with Low Acoustic Transmission Loss	Osamu Terashima	Toyama Prefectural University	Hiroki Nagai	Tohoku University
J24I093	Fundamental Research on a New AA-PSP for Enhancing the Accuracy of Pressure Field Measurements on the Surface of Supersonic Projectiles	Daiju Numata	Tokai University	Kiyonobu Ohtani	Tohoku University
J24I094	Integrated Analysis between Running Engine and Airframe using Sliding Mesh Technique	Kazuhiisa Chiba	The University of Electro-Communications	Shigeru Obayashi	Tohoku University
J24I097	Relationship between Micro-structure of Nano-Fiber and Rheological Property in Cellulose Nano-Fiber Dispersion	Motozawa Masaaki	Shizuoka University	Hidemasa Takana	Tohoku University
J24I098	Analysis of Thermophysical Properties of Formic Acid as Phase-Change Material Based on Aluminum Fumarate as Metal-Organic Frameworks Using Molecular Dynamics Simulation as a Reviewing Approach	Nasruddin Yusuf Rodjali	Universitas Indonesia	Takashi Tokumasu	Tohoku University
J24I099	Development of High-precision Estimation Techniques for Aerodynamic Heating using Functional Molecular Sensors	Hiroki Nagai	Tohoku University	Bok Jik Lee	Seoul National University
J24I100	Hybridization of Nanocellulose with Silver Nanoparticles for the Fabrication of Antibacterial Filament Composites by a Field-assisted Flow Focusing Method	Hidemasa Takana	Tohoku University	Anthony B. Dichiera	University of Washington
J24I101	Molecular Dynamics Analysis of Carrier Selective Passivating Contact Interface Structures	Noritaka Usami	Nagoya University	Takashi Tokumasu	Tohoku University
J24I102	Understanding the Role of Fluids in the Nucleation Process of the Noto, Japan, 2024, Mw 7.5 earthquake	Cornelius Langenbruch	Freie Universität Berlin	Yusuke Mukuhira	Tohoku University
J24I103	Multi-scale Analysis of Oxygen Ion Conduction Property in Solid Oxide Electrolyte Membrane	Takashi Tokumasu	Tohoku University	Jeongmin Ahn	Syracuse University
J24I104	Feature Extraction for Better Prediction of Thermo-physical Properties of Organic Materials Using Machine Learning Algorithms	Hari Krishna Chilukoti	National Institute of Technology, Warangal	Gota Kikugawa	Tohoku University
J24I105	Evaluation of the Dynamics of Natural Convection Thermal Boundary Layer under High Grashof Number Condition	Atsuki Komiya	Tohoku University	Nicholas Williamson	The University of Sydney
J24I106	Schlieren Imagery of Low frequency AC voltage EHD of Phase Change Materials	James Cotton	McMaster University	Takehiko Sato	Tohoku University

92 selected projects

List of selected projects for International Multiple Collaborative Research Project 2024, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member (Institution)
J24R001	Numerical Simulation of the Effect of Viscosity on the Directional Movement of Droplets on the Bioinspired Micro/Nanostructured Surfaces	Aike Qiao	Beijing University of Technology	Makoto Ohta (Tohoku University), Hongfang Song (Capital Medical University), Wenyu Fu (Beijing Union University)
J24R002	Prediction and Optimisation of Axisymmetric Shock Reflection in Supersonic Aerospace Applications	Hideaki Ogawa	Kyushu University	Kiyonobu Ohtani (Tohoku University), Roderick Boswell (Australian National University), Sannu Mölder (Ryerson University), Evgeny Timofeev (McGill University), Thiruchengode Muruganandam (Indian Institute of Technology Madras), Taro Handa (Toyota Technological Institute)
J24R003	Theoretical Simulation on Growth of Functioning Materials	Satoru Kaneko	Kanagawa Institute of Industrial Science and Technology (KISTEC)	Takashi Tokumasu (Tohoku University), Masahiro Yoshimura (Kanagawa Institute of Industrial Science and Technology), Rwei-Sung Yu (Asia University, Taiwan), Sardar Kripasindhu (National Cheng Kung University), Sahoo Sumanta (Radhakrishna Institute of Technology and Engineering), Shigeo Yasuhara (Japan Advanced Chemicals), Can Musa (Istanbul University), Ionita Mariana (University Politehnica of Bucharest)
J24R004	Towards Fluid-structure Interaction Analysis using High-order Flux-reconstruction Scheme and Cross-platform-based Parallel Computation	Yoshiaki Abe	Tohoku University	Freddie Witherden (Texas A&M University), Peter Vincent (Imperial College London), Brian Vermeire (Concordia University), Jin Seok Park (Inha University)

4 selected projects

List of selected projects for LyC Collaborative Research Project 2024, IFS, Tohoku University (as 27th May, 2024)

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J24Ly01	Turing Patterns on Thermally Fluctuating Membranes: Numerical and Mathematical Studies on the Origin of Anisotropic Turing Patterns	Fumitake Kato	National Institute of Technology, Ibaraki College	Tetsuya Uchimoto	Tohoku University
J24Ly02	Local Compression Test of 3D-printed SiC in an Electron Microscope	Hiroki Kurita	Graduate School of Environmental Studies, Tohoku University	Tetsuya Uchimoto	Tohoku University
J24Ly03	Epoxy Polymer for Ammonia Storage Solutions	Mary Nicolas	MATEIS, CNRS, INSA Lyon	Tetsuya Uchimoto	Tohoku University
J24Ly04	VIVO-CHIP: Vascular Integration in Three-Dimensional Organoid-on-Chip Platform	Aznar Nicolas	University Claude Bernard Lyon 1	Kenichi Funamoto	Tohoku University
J24Ly05	Monitoring Eukaryotic Cell Functions under Various Hypoxic Conditions with Microfluidic Differential Oxygenators	Rieu Jean-Paul	University Claude Bernard Lyon 1	Kenichi Funamoto	Tohoku University
J24Ly06	Numerical Study on Electrical Drift and Diffusion of Ions in Polymer Strips	Joel Courbon	INSA Lyon	Hidemasa Takana	Tohoku University
J24Ly07	Experimental Study of New Model Electroactive Materials (TEmpuRA)	Gildas Coativy	INSA Lyon	Hidemasa Takana	Tohoku University
J24Ly08	Coupled Analysis Approach to Integrated Multiphase Energy Systems	Jun Ishimoto	Tohoku University	Thomas Elguedj	INSA Lyon, LaMCoS
J24Ly09	Shape Estimation of Pipe Inner Corrosion based on Ultrasonic Reflection	Hiroyuki Nakamoto	Kobe University	Tetsuya Uchimoto	Tohoku University
J24Ly10	Nonlinear Bifurcation and Dynamic Mode decomposition for Taylor Vortex in Gap between Rotating Two Cylinders/Cones	Adachi Takahiro	Akita University	Atsuki Komiya	Tohoku University
J24Ly11	Active Control of Protein Mass Transfer by Membranes with Various Pore Patterns	Atsuki Komiya	Tohoku University	Sebastien Livi	INSA Lyon
J24Ly12	Mass Transfer Enhancement and Control by using Ultrasound Induced Flow	Atsuki Komiya	Tohoku University	Valery Botton	INSA Lyon
J24Ly13	Carbon Diffusion in Iron Assisted by an Electric Field	Patrice Chantrenne	INSA Lyon	Takashi Tokumasu	Tohoku University

13 selected projects