

List of selected projects for General Collaborative Research Project 2025, IFS, Tohoku University (as 1st April, 2025)

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFS responsible member	Institution
J25I001	Large-scale Numerical Analysis of the Intermembrane Electrical System in Plasma-stimulated Cells	Satoshi Uchida	Tokyo Metropolitan University	Takehiko Sato	Tohoku University
J25I002	Experimental Study of Shielding Performance of Thermally-cured Inflatable Structures	Kanjuro Makihara	Tohoku University	Kiyonobu Ohtani	Tohoku University
J25I003	Supercritical Real-Fluid Oxidations of Ammonia by Using the SP-Virial Thoery	Hao Zhao	Peking University	Hisashi Nakamura	Tohoku University
J25I004	Machine-learning-based Analysis for Microseismic Monitoring of Water Injection in Muara Laboh Geothermal Field, Indonesia	Dian Darisma	University of Syiah Kuala	Yusuke Mukuhira	Tohoku University
J25I005	Mechanism of YSZ Phase Transition and Ionic Conductivity	Yuting Guo	Kyoto University	Taku Ohara	Tohoku University
J25I006	Molecular Simulation of CO ₂ Permeation though Microalgae Lipid Memebrane	Takuya Mabuchi	Tohoku University	Fayza Yulia	Pertamina University
J25I007	A Study of Heat Stroke Dynamics by Combined Analysis of Radiation and Convection	Hiroki Gonome	Yamagata University	Junnosuke Okajima	Tohoku University
J25I008	Molecular Dynamics Analysis of Carrier Selective Passivating Contact Interface Structures	Noritaka Usami	Nagoya University	Takashi Tokumasu	Tohoku University
J25I009	High-Efficiency Ammonia Production by Interfacial Reaction between Fine Water Droplet and Nitrogen Plasma	Ryoya Shiraishi	Yamaguchi University	Takashi Tokumasu	Tohoku University
J25I010	Attenuation Effect of Shock Environment in Supersonic Flow using the Soft Body	Kazutaka Kitagawa	Aichi Institute of Technology	Kiyonobu Ohtani	Tohoku University
J25I011	Silicon Carbide Crystal Growth and Its Simulation on Three-dimensional Structure of Different Materials using ReaxFF	Wakana Takeuchi	Aichi Institute of Technology	Takashi Tokumasu	Tohoku University
J25I012	Numerical Analysis of the Flow Around a Wing-body Combination Model with Flapping	Tadateru Ishide	National Institute of Technology, Kisarazu College	Hiroki Nagai	Tohoku University
J25I013	Study on Flow Interaction Effect to Rotor Perfromace of Multirotors	Hikaru Otsuka	Kanazawa University	Hiroki Nagai	Tohoku University
J25I014	Study on Flow Strucutre Around Rotor Blade with Turbulators in Low Reynolds Numbers	Hikaru Otsuka	Kanazawa University	Tsubasa Ikami	Tohoku University
J25I015	Low-Speed Aeroelastic Buffeting of Tail Wings: Theory and Analysis	Keisuke Otsuka	Tohoku University	Yoshiaki Abe	Tohoku University
J25I016	Performance Investigation and Optimization Analysis of a Spectral Splitting Concentrating Photovoltaic Thermal (CPVT) System with a Unique Design: Numerical and Experimental Approaches	Abid USTAOGLU	Bartin University	Junnosuke Okajima	Tohoku University
J25I017	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
J25I018	Intrinsic Instabilities of Partially Cracked Ammonia/Air Flames	Chen Zheng	Peking University	Youhi Morii	Tohoku University
J25I019	Elucidation of Taylor-Couette Flow Field under Electromagnetic Fields and Its Application to Energy Conversion Devices	Hiromichi Kobayashi	Keio University	Hidemasa Takana	Tohoku University
J25I020	Fabrication of Flow Chamber for Nanofibrous Layer Covered Stents	Angela Jedlovsky-Hajdu	Semmelweis University	Makoto Ohta	Tohoku University
J25I021	Comparative Study of Steel Hydrogen Embrittlement using Ultrasonic and Eddy Current Characterization Techniques	Guy Feuillard	INSA Centre Val de Loire GREMAN	Tetsuya Uchimoto	Tohoku University
J25I022	Laminar Flame Speed Measurement and Kinetics Modeling Study of Tri-Methyl-Phosphate (TMP) Combustion –Toward P-Containing Fire Suppressants for Lithium-Ion Battery Electrolytes	Olivier Mathieu	Texas A&M University	Hisashi Nakamura	Tohoku University
J25I023	Molecular Simulation of Conductive Polymer Electrolyte Composite Membranes for Application in Electrochemical Devices	Phumlani Msomi	University of South Africa	Takuya Mabuchi	Tohoku University
J25I024	Three-dimensional Numerical Simulation on Gas Pore Inside Liquid Metal Droplet	Joe Yoshikawa	Industrial Technology Institute, Miyagi Prefectural Government	Hidemasa Takana	Tohoku University
J25I025	Investigation of Plasma-liquid Surface Interactions by a Molecular Dynamics Simulation	Katsuyuki Takahashi	Iwate University	Takuya Mabuchi	Tohoku University
J25I026	Shock Wave Experiments Around a Hypersonic Vehicle for CFD Validation Data Acquisition	Michiko Furudate	Chungnam National University	Hiroki Nagai	Tohoku University
J25I027	Characterization of Particulate Morphology Generated from Li-Ion Battery (LiB) Combustion Processes	Samuel L. Manzello	Reax Engineering	Kaoru Maruta	Tohoku University
J25I028	Dynamics Simulation of Endothelial Cell Migration under Shear Flow	Narendra Kurnia Putra	Institut Teknologi Bandung	Hitomi Anzai	Tohoku University
J25I029	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
J25I030	Generation of Charged Cavitation Bubbles and the Characteristics	Takehiko Sato	Tohoku University	Farhat Mohamed	Ecole Polytechnique Federale de Lausanne (EPFL)
J25I031	Calculation of Local Surface Tension Field of Lipid Monolayer under Rapid Deformation	Tetsuya Kanagawa	University of Tsukuba	Takuya Mabuchi	Tohoku University
J25I032	Study on Improving the Performance of a Roadable Aircraft with Wind Tunnel Testing and Fluid Simulation	Seiichiro Morizawa	National Institute of Technology, Okinawa College	Tsubasa Ikami	Tohoku University
J25I033	Development of Compressive Sensing Technique for Complex Fluid Phenomena	Yu Matsuda	Waseda University	Hiroki Nagai	Tohoku University
J25I034	Expression of New Functions of Water by Impinging High-speed Nanodroplets	Takehiko Sato	Tohoku University	Seiji Kanazawa	Oita University
J25I035	Magnetic Incremental Permeability Detection Method and Experimental Technology for Stress under High-Temperature for Ferromagnetic Materials	Shurui Zhang	Beijing University of Technology	Tetsuya Uchimoto	Tohoku University
J25I037	An Analysis of Geometrical Characteristics of Bundles of Vortical Axis Lines and Formation of Turbulent Vortical Flow Structure	Katsuyuki Nakayama	Aichi Institute of Technology	Yuji Hattori	Tohoku University
J25I038	Effect of Charge Distribution on the Plasma-induced Fine Bubble Dynamics	Liu Siwei	Tohoku University	Supponen Outi	ETH
J25I040	Unsteady Aerodynamic Characteristics of Flexible-Membrane Wing for Mars Airplane	Daisuke Sasaki	Osaka Metropolitan University	Hiroki Nagai	Tohoku University
J25I041	Numerical Study on High-Speed Space Transportation System Driven by Partially-Ionized Plasma Flow	Masayuki Takahashi	Tohoku University	Hiroki Nagai	Tohoku University

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J25I042	Investigation of Device Fabrication Techniques for Sulfide-based Nanomemory	Takeo Ohno	Oita University	Kazuhiko Endo	Tohoku University
J25I043	Development of a Method for Predicting Flow Phenomena in Fuel Cells during a Long Start-up Time	Seiichiro Morizawa	National Institute of Technology, Okinawa College	Takashi Tokumasu	Tohoku University
J25I044	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
J25I045	Numerical Modeling of Transport Phenomena in the Vicinity of Solid-liquid Interface in Desalination with Gas Hydrate Formation	Yuki Kanda	Tohoku University	Hiroyuki Komatsu	Niigata University
J25I046	Development of Ultra-bright Pressure-sensitive Paint using Nanomaterials and Application in Low-speed Wind Tunnel Experiments	Kanako Watanabe	Tohoku University	Tsubasa Ikami	Tohoku University
J25I047	Numerical Simulation of Mass Transfer in Supercritical Carbon Dioxide	Yuki Kanda	Tohoku University	Yingxue Hu	Xi'an Jiaotong University
J25I048	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
J25I049	Development of Transparent Ultrasound Phantom Material: Sound Velocity Study	Muhammad Shiddiq Sayyid Hashuro	Bandung Institute of Technology	Makoto Ohta	Tohoku University
J25I050	Synthesis of Sulufonated Carbon Catalysts using Combination Process of Plasma in Liquid and Ultrasonic Cavitation	Nozomi Takeuchi	Institute of Science Tokyo	Hidemasa Takana	Tohoku University
J25I051	Experiment and Simulation of a Rotaiting Hollow Cylinder in Flight	Katsuya Hirata	Doshisha University	Jun Ishimoto	Tohoku University
J25I052	Fundamental Study of Weak Radiation behind Air Shock Waves	Masato Funatsu	Gunma University	Kiyonobu Ohtani	Tohoku University
J25I053	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
J25I054	Multiphase Thermaly Coupled Computing Approach to the Development of Pulsating Heat Pipes under Microgravity Conditions	Jun Ishimoto	Tohoku University	Sławomir Pietrowicz	Wrocław University of Science and Technology
J25I055	Dynamics of Single Cavitation Bubbles in Carbon Dioxide-Supersaturated Water	Liu Siwei	Tohoku University	Preso Davide Bernardo	University of Oxford
J25I057	Advanced Microseismic Data Analysis for Understanding Hydrothermal System of the Kuju Volcano	Tatsunori Ikeda	Kyushu University	Yusuke Mukuhira	Tohoku University
J25I058	Data-driven Science of Coarse-grained High Reynolds Number Turbulence based on Large-scale DNS	Takashi Ishihara	Okayama University	Yuji Hattori	Tohoku University
J25I059	Clarifying the Effect of the Shape of the Trailing Edge of the Wing on Tone Noise and the Mechanism Behind It	Hiroaki Sumikawa	Iwate University	Tsubasa Ikami	Tohoku University
J25I060	Study of the Liquid Film Thickness Near the Capillary Limit	Andrzej Ireneusz Nowak	Wrocław University of Science and Technology	Junnosuke Okajima	Tohoku University
J25I061	Sonic-boom Surrogate Model Integration in a Chemistry-climate Model	Hiroshi Yamashita	Deutsches Zentrum für Luft- und Raumfahrt (DLR)	Aiko Yakeno	Tohoku University
J25I062	Molecular Dynamics Simulation for Determining Static and Kinetic Parameters of CO ₂ Adsorption in Direct Air Capture (DAC) Applications	Nasruddin Yusuf Rodjali	Universitas Indonesia	Takashi Tokumasu	Tohoku University
J25I063	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
J25I064	Study on Conceptual Dsing of an Aircraft Fueled with Ammonia	Hisashi Nakamura	Tohoku University	Shimokuri Daisuke	Hiroshima University
J25I065	Development of a Plasma-liquid Interfacial Reactor on a Microfluidic Chip	Hiroyuki Yoshiki	National Institute of Technology, Sendai College	Takehiko Sato	Tohoku University
J25I066	Blood Flow Analysis of Aorta-left Ventricle System with Aortic Valve	Suguru Miyauchi	University of Miyazaki	Kenichi Funamoto	Tohoku University
J25I067	Numerical Study on Energy and Scalar Transfer in Turubulence with Non-equilibrium Features	Yasumasa Ito	Nagoya University	Yuji Hattori	Tohoku University
J25I068	Dynamics of Shockwave and Transport of Ballistic Blocks in a Volcanic Eruption	Kae Tsunematsu	Yamagata University	Kiyonobu Ohtani	Tohoku University
J25I069	The Structure and Propagation of Ignition Fronts of Reacting Mixtures under Autoignitve Engine-relevant Conditions: from Deflagration to Detonation	Minh Bau LUONG	Hanoi University of Science and Technology	Youhi Morii	Tohoku University
J25I070	Free-motion Wind Tunnel Testing of a Lifting Atmospheric Entry Capsule	Kazuyuki Ueno	Iwate University	Hiroki Nagai	Tohoku University
J25I071	Study on Visualization of Concentration Boundary Layer near Gas-liquid Interface in Gas Absorption	Yuki Kanda	Tohoku University	Junhao (Kris) Ke	The University of Sydney
J25I072	Elucidation of Viscous Drag Reduction Mechanism by Riblet Processing	Akira Oyama	Institute of Space and Astronautical Science (JAXA)	Aiko Yakeno	Tohoku University
J25I073	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. Dichiara	University of Washington
J25I074	Molecular Dynamics Study of Nano-Bubble on Solid Surface and Surface Property	Hiroki Nagashima	University of the Ryukyus	Takashi Tokumasu	Tohoku University
J25I075	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
J25I076	Development of Sub-10 μ m micro-LED	Seiji Samukawa	National Yang Ming Chiao Tung University	Daisuke Ohori	Tohoku University
J25I078	A Study on Nano/Mezo-scale Interfacial Phenomena between Surface-modified Material and Dispersed Media	Masaki Kubo	Tohoku University	Atsuki Komiya	Tohoku University
J25I079	Fabrication of Metal/Dielectric Plasmonic Nanostructures and Evaluation of Their Emission Enhancement Properties	Takayuki Kiba	Kitami Institute of Technology	Daisuke Ohori	Tohoku University
J25I080	Control of Wake of Wind Turbines based on Instability of Helical Vortices	Yuji Hattori	Tohoku University	Ivan Delbende	Sorbonne University
J25I081	Study on Micro-scale Evaporation for Heat Transfer Enhancement	Junnosuke Okajima	Tohoku University	Peter Stephan	Technical University of Darmstadt
J25I083	Integrated Analysis of a Propfan-Engine-Powered Airliner for Improved Fuel Efficiency	Kazuhiisa Chiba	The University of Electro-Communications	Yoshiaki Abe	Tohoku University

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J25I084	Investigation on Extravasation of Circulating Tumor Microemboli by using Microfluidic Platform	Ting-Yuan Tu	National Cheng Kung University	Kenichi Funamoto	Tohoku University
J25I085	Control of Transonic / High-speed Boundary Layer Flows	Yuji Hattori	Tohoku University	Adrian Sescu	Mississippi State University
J25I086	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 of Engineering & Technology
J25I087	The Blood-brain Barrier Microfluidics for Drug Development of Brain Metastasis	Masanori Tachikawa	Tokushima University	Kenichi Funamoto	Tohoku University
J25I088	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
J25I089	Innovative Strategies for Glaucoma Management Through CFD Modeling of Aqueous Humor Flow	Muhamed Albadawi	Alexandria University (Egypt) / University College Dublin (Ireland)	Makoto Ohta	Tohoku University
J25I090	Research on Power Generation Technology using Flow-induced Vibration	Hiroaki Hasegawa	Utsunomiya University	Hiroki Nagai	Tohoku University
J25I091	Schlieren imagery of AC voltage EHD of Seeding Particle Enhanced Phase Change Materials	James Cotton	McMaster University	Takehiko Sato	Tohoku University
J25I093	Precise Measurement of the Effect of Deceleration on the Drag Coefficient	Takamasa Kikuchi	Nihon University	Kiyonobu Ohtani	Tohoku University
J25I094	Evaluation of Thermal Propagation Properties at the Interface between Nano-sized Semiconductors and Metals by Laser Heterodyne Photothermal Displacement Method	Atsuhiko Fukuyama	University of Miyazaki	Daisuke Ohori	Tohoku University
J25I095	Development of Technology to Generate Quasi-atmospheric Winds by Injecting Multiple Shear Forces	Kotaro Takamure	Akita University	Ippei Oshima	Tohoku University
J25I096	Strategic Deployment of Aerosol Sensors in Confined Spaces for Enhanced Respiratory Virus Detection: an Optimisation Study Based on Computational Fluid Dynamics Simulations	Yujie Li	Torrens University Australia	Makoto Ohta	Tohoku University
J25I097	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
J25I098	Development and Fundamental Research on a Two-Color DP-AA-PSP for High-Precision Pressure Field Measurement on the Surface of Supersonic Projectiles	Daiju Numata	Tokai University	Kiyonobu Ohtani	Tohoku University
J25I100	Experimental Investigation on Shock Wave Development in Opaque Medium	Toshiharu Mizukaki	Tokai University	Kiyonobu Ohtani	Tohoku University
J25I101	Elucidation of the Self-assembly Mechanism of Functional Amyloid Protein Derived from Filamentous Fungi	Keietsu Abe	Tohoku University	Takuya Mabuchi	Tohoku University
J25I102	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
J25I104	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
J25I105	Numerical Analysis of Transfer Phenomena in Ultra-low Fill Rate Heat Pipe	Asami Hatamoto	Aoyama Gakuin University	Hiroki Nagai	Tohoku University
J25I106	Control of Natural Convection Thermal Boundary Layer under High Grashof Number Condition and Heat Transfer Enhancement	Atsuki Komiya	Tohoku University	Nicholas Williamson	The University of Sydney
J25I107	Harnessing Machine Learning for Enhancing Fluid Mechanics Understanding in Riblet Surfaces	Lavi Rizki Zuhai	Institut Teknologi Bandung	Aiko Yakeno	Tohoku University
J25I108	Feature Importance in the Predictive Capabilities of Machine Learning Models: Application for Estimating Thermo-physical Properties of Organic Materials	Hari Krishna Chilukoti	National Institute of Technology, Warangal	Gota Kikugawa	Tohoku University
J25I109	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
J25I110	Analysis of Power Generation from Ammonia based Fuel in Solid Oxide Fuel Cells	Jeongmin Ahn	Syracuse University	Hisashi Nakamura	Tohoku University

102 selected projects

List of selected projects for International Multiple Collaborative Research Project 2025, IFS, Tohoku University

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J25R001	Tracheal Stent for Precision Drug Release Driven by the Piezoelectric Effect	Aike Qiao	Beijing University of Technology	Makoto Ohta (Tohoku University), Hongfang Song (Capital Medical University)
J25R002	Utilization of Coastal Wave Energy as Renewable Energy and Enhancement of Coastal Protection through Turbine Optimization in the Overtopping Breakwater for Energy Conversion (OBREC)	Pratama Raditya Hendra	National Research and Innovation Agency	Ippei Oshima (Tohoku University), Samsu Dlukha Nurcholik (Kalimantan Institute of Technology)
J25R003	Proposal of a Simple Simulation Method for the Growth of Functional Materials	Satoru Kaneko	Kanagawa Institute of Industrial Science and Technology (KISTEC)	Takashi Tokumasu (Tohoku University), Ruei-Sung Yu (National Chin-Yi University of Technology), Sahoo Sumanta (Radhakrishna Institute of Technology and Engineering), Can Musa (Istanbul University), Ionita Mariana (University Politehnica of Bucharest), Meskinis Sarunas (Kaunas University of Technology)
J25R004	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