List of selected projects for General Collaborative Research Project 2021, IFS, Tohoku University (as 1st April, 2021)

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J21I001	Effects of inert-gas addition on the unstable behavior of hydrogen-air premixed flames	Satoshi Kadowaki	Nagaoka University of Technology	Hideaki Kobayashi	Tohoku University
J21I002	The visualization of cavitation instabilities in centrifugal pumps	Kang, Donghyuk	Saitama University	Yuka Iga	Tohoku University
J21I003	Efficient Uncertainty Quantification of Fluid Flow Problems via Combination of Kriging Surrogate Modeling and Proper Orthogonal Decomposition	Mehrdad Raisee Dehkordi	University of Tehran	Koji Shimoyama	Tohoku University
J21I004	Numerical study on wind instruments with compressible DNS	Kin'ya Takahashi	Kyushu Institute of Technology	Yuji Hattori	Tohoku University
J21I006	Effects of the turbulence interaction on the rise time of a sonic boom pressure signature	Takahiro Ukai	Osaka Institute of Technology	Kiyonobu Ohtani	Tohoku University
J21I007	On the multi dynamic mode analysis of flow-induced noise from an elastic bodies	Osamu Terashima	Toyama Prefectural University	Yasufumi Konishi	Tohoku University
J21I008	A study on nano-scale interfacial phenomena of surface-modified nanoparticle suspensions	Takao Tsukada	Tohoku University	Atsuki Komiya	Tohoku University
J21I010	Theoritical simulation on epitaxial growth of functioning thin film	Satoru Kaneko	Kanagawa Institute of Industrial Science and Technology	Takashi Tokumasu	Tohoku University
J21I011	Development of PSP measurement technique using structured illumination	Yu Matsuda	Waseda University	Hiroki Nagai	Tohoku University
J21I013	Aeroelastic Model of Very Flexible Membrane Wings: Theory and Experiment	Keisuke Otsuka	Tohoku University	Koji Fujita	Tohoku University
J21I014	Sustainable Ammonia Production by Plasma method	Ryoya Shiraishi	National Institute of Technology,Yonago College	Takashi Tokumasu	Tohoku University
J21I015	Propeller-Slipstream/Main-Wing Aerodynamic Interaction for Mars Airplane	Keiichi Kitamura	Yokohama National University	Hiroki Nagai	Tohoku University
J21I016	Fundamental studies on turbulent energy/scalar transport in non-universal turbulences	Yasumasa Ito	Nagoya University	Yuji Hattori	Tohoku University
J21I017	Control of reaction field in cavitation plasma for high-speed and eco-friendly synthesis of carbon catalysts	Nozomi Takeuchi	Tokyo Institute of Technology	Hidemasa Takana	Tohoku University
J21I019	Developing an interaction model of rod-like Brownian particles in a crossflow for nanocellulose mono-fiber creation using flow focusing	Yukitaka Ishimoto	Akita Prefectural University	Hidemasa Takana	Tohoku University
J21I020	Study on fundamental combustion characteristics of Jatropha surrogate fuel	Willyanto Anggono	Petra Christian University	Akihiro Hayakawa	Tohoku University
J21I023	A study of mechanism that the vortical flow topology in its core region forms topological characteristics of a vortical axis	Katsuyuki Nakayama	Aichi Institute of Technology	Yuji Hattori	Tohoku University
J21I024	Experimental observation and numerical simulation toward smart control of suspension rheology	Tomohiro Fukui	Kyoto Institute of Technology	Kenichi Funamoto	Tohoku University
J21I025	An Experimental study of ethyl-methyl-carbonate (EMC) combustion	Olivier Mathieu	Texas A&M University	Hisashi Nakamura	Tohoku University
J21I026	Product gas characteristics of ammonia/hydrogen fuel at high pressure conditions	Akihiro Hayakawa	Tohoku University	Valera-Medina, Agustin	Cardiff University
J21I027	Understanding failure phenomena accelerated by machine learning for subsurface energy development	Yusuke Mukuhira	Tohoku University	Makoto Naoi	Kyoto University
J21I028	Spectroscopy of high enthalpy flows around a reentry vehicle with Ballistic Range	Gouji Yamada	Tokai University	Kiyonobu Ohtani	Tohoku University
J21I029	Study on the function of Au-DLC nano-composite coatings acting as thermo-sensor in the sliding interface under severe corrosive conditions	Minoru Goto	National Institute of Technology, Ube College	Hiroyuki Miki	Tohoku University

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J21I030	Development of sonic boom evaluation function under real meteorological conditions	Hiroshi Yamashita	Deutsches Zentrum für Luft- und Raumfahrt (DLR)	Shigeru Obayashi	Tohoku University
J21I031	Transition delay and drag reduction mechanism by designed surface roughness	Aiko Yakeno	Tohoku University	Nugroho Bagus	The University of Melbourne
J21I032	Development of a novel arterial lesion vessel model for pulsatile cerebrovascular circulatory simulation	Tsuboko Yusuke	Waseda University	Makoto Ohta	Tohoku University
J21I035	Numerical Simulations as Evaluation Method for Biofluidic Experiments	Narendra Kurnia Putra	Institut Teknologi Bandung	Hitomi Anzai	Tohoku University
J21I036	Investigation of phonon dynamics in quantum nano-structures by using high-sensitivity detection of the non-radiative recombination	Atsuhiko Fukuyama	University of Miyazaki	Seiji Samukawa	Tohoku University
J21I037	Effects of pulsatile flow on endothelial permeability and cell motility	Eugenia Corvera Poire	National Autonomus University of Mexico	Kenichi Funamoto	Tohoku University
J21I038	Study on MHD phenomena in Co-axial MHD Energy Conversion Device	Hiromichi Kobayashi	Keio University	Hidemasa Takana	Tohoku University
J21I039	Hyper-velocity collision experiment for tether satellites to remove space debris	Kanjuro Makihara	Tohoku University	Kiyonobu Ohtani	Tohoku University
J21I041	Development of thermal barrier fire extinguishing devices	Hiroki Gonome	Yamagata University	Junnosuke Okajima	Tohoku University
J21I043	Development of pressure measurement method in laser-caviation bubbles	Takehiko Sato	Tohoku University	Mohamed Farhat	Ecole Polytechnique Federale de Lausanne (EPFL)
J21I044	Correlation between oxygen ion conductivity and GBs in solid oxide electrolyte membrane	Takashi Tokumasu	Tohoku University	Jeongmin Ahn	Syracuse University
J21I045	Design and optimization of multidirectional wings of the aero-train under the effect of static aeroelasticity	Chenguang Lai	Chongqing University of Technology	Shigeru Obayashi	Tohoku University
J21I047	Development of pressure distribution measurement technique for free flight next-generation re-entry capsule	Hiroki Nagai	Tohoku University	Hirotaka Sakaue	University of Notre Dame
J21I048	Establishment of high-accuracy analysis method of spacecraft thermal system using data assimilation	Hiroki Nagai	Tohoku University	Takashi Misaka	National Institute of Advanced Industrial Science and Technology
J21I049	Active control of high-speed boundary layer flows	Yuji Hattori	Tohoku University	Adrian Sescu	Mississippi State University
J21I050	Instability and Wave Interactions in Helical Vortices	Yuji Hattori	Tohoku University	Ivan Delbende	LIMSI
J21I051	Numerical Simulation of a Thermal Plasma Reactor for the Wastes to Energy	Sooseok Choi	Jeju National University	Hidemasa Takana	Tohoku University
J21I052	Comprehensive study on two-phase thermo-fluid phenomena in a cryogenic loop heat pipe	Kimihide Odagiri	Japan Aerospace Exploration Agency	Hiroki Nagai	Tohoku University
J21I054	Numerical study on transonic flow characteristics over return capsules	Bok Jik Lee	Seoul National University	Hiroki Nagai	Tohoku University
J21I055	Exploration of Novel Combined Compression-Ignition Combustion Engine and Solid Oxide Fuel System for Power Generation and Emission Control	Jeongmin Ahn	Syracuse University	Hisashi Nakamura	Tohoku University
J21I056	Flow visualization of a high-speed projectile with plenoptic optics	Toshiharu Mizukaki	Tokai University	Kiyonobu Ohtani	Tohoku University
J21I057	3D Human Blood-Brain Barrier Chip for CNS Drug Development	Masanori Tachikawa	Tokushima University	Kenichi Funamoto	Tohoku University
J21I059	Investigation of phase change heat transfer at human body skin in high temperature environment such as Sauna room	Takuma Kogawa	National Institute of Technology, Hachinohe College	Junnosuke Okajima	Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J21I061	Modelling Core Scale: Investigation of Multiscale porosity using 3D printed micromodels	Anna Suzuki	Tohoku University	Maes, Julien	Heriot-Watt University
J21I062	Data-driven modeling of flow in complex structures	Anna Suzuki	Tohoku University	James Minto	University of Strathclyde
J21I063	Geothermal Onsen Seminar	Anna Suzuki	Tohoku University	Roland N. Horne	Stanford University
J21I064	Evaluation of Defects In CFRP Material Based on High Freqnency Eddy Current Testing Method	Chen Zhenmao	Xi'an Jiaotong University	Tetsuya Uchimoto	Tohoku University
J21I065	Detecting and locating microseismic events at Groningen as a natural laboratory for understanding induced seismicity mechanisms	Norimitsu Nakata	Massachusestts Institute of Technlogy	Yusuke Mukuhira	Tohoku University
J21I066	Unsteady Aerodynamics of Axially Oriented Low Fineness Ratio Cylinders	Colin Britcher	Old Dominion University	Shigeru Obayashi	Tohoku University
J21I067	Novel insights into the the co-combustion of carbonyl compounds and hydrocarbon fuels	Denis Knyazkov	Voevodsky Institute of Chemical Kinetics and Combustion	Hisashi Nakamura	Tohoku University
J21I068	Multifunctional hybrid filaments comprising aligned nanocellulose and carbon nanotubes synthesized by a field-assisted flow focusing method	Anthony B Dichiara	University of Washington	Hidemasa Takana	Tohoku University
J21I071	Hybrid nanomaterials reinforcement in biolubricants	Takashi Tokumasu	Tohoku University	Yusuf Rodjali, Nasruddin	Universitas Indonesia
J21I072	Development of Pressure-Sensitive Paint for Realizing Pressure Field Measurement on Hypersonic Projectiles	Daiju Numata	Tokai University	Kiyonobu Ohtani	Tohoku University
J21I073	Evaluation of Natural Convection Flow under Spatiotemporally Variable Thermal Condition	Atsuki Komiya	Tohoku University	Nicholas Williamson	The University of Sydney
J21I074	Explore the shaping effects of arteriovenous fistula on haemodynamics in patients receiving haemodialysis	Mingzi Zhang	Macquarie University	Makoto Ohta	Tohoku University
J21I076	Active Control of Natural Convection for Efficient Ventilation by Low Energy	Atsuki Komiya	Tohoku University	Victoria Timchenko	The University of New South Wales
J21I077	Numerical molecular analysis of reactive species behavior between discharge plasma and biological surface	Satoshi Uchida	Tokyo Metropolitan University	Takehiko Sato	Tohoku University
J21I078	Conductive mechanism of carbon nanotube dispersed resin based composite materials	Noboru Nakayama	Shinshu University	Hiroyuki Miki	Tohoku University
J21I079	Studying Structure-Property Relations for Organic Materials using Machine Learning	Hari Krishna Chilukoti	National Institute of Technology, Warangal	Gota Kikugawa	Tohoku University
J21I080	An innovative Method of Generating Plasma Microbubbles in Flowing Water	Jong-Shinn Wu	National Yang Ming Chiao Tung University	Takehiko Sato	Tohoku University
J21I081	Individual effects of plasma-generated electrical field, short-life species, and long-life species on cell	Yun-Chien Cheng	National Yang Ming Chiao Tung University	Takehiko Sato	Tohoku University
J21I082	Study of shock wave-particles interaction	Kazuya Tajiri	Michigan Technological University	Aiko Yakeno	Tohoku University
J21I083	Design and Simulation of Nanopillar-Embedded MOSFETs	Yiming Li	National Yang Ming Chiao Tung University	Seiji Samukawa	Tohoku University
J21I086	The dynamic behavior of marine ecosystems in the complex flows	Evgeniy Dats	Institute of Applied Mathematics FEB RAS	Junnosuke Okajima	Tohoku University
J21I088	Numerical simulation of flowfields over Mars entry capsules	Michiko Furudate	Chungnam National University	Hiroki Nagai	Tohoku University
J21I089	New parameterization methods for uncertainty quantification of geothermal reservoir models	Anna Suzuki	Tohoku University	Nicholson, Ruanui	The University of Auckland

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J21I090	Feasibility study of an air transportation system with flying vehicle among isolated islands and major cities around Naha airport using existing airports	Seiichiro Morizawa	National Institute of Technology, Okinawa College	Shigeru Obayashi	Tohoku University
J21I091	Construction of Flutter Boundary in Aeroelasticity via Advanced Machine Learning Models	Pramudita Satria Palar	Bandung Institute of Technology	Koji Shimoyama	Tohoku University
J21I092	Influence of Propeller wake on Aerodynamics/ Flight Dynamics Characteristics for Mars Airplane	Masahiro Kanazaki	Tokyo Metropolitan University	Hiroki Nagai	Tohoku University
J21I093	Thermal conductivity reduction and carrier concentration optimization for development of nanocomposite materials with enhanced thermoelectric figure of merit	Vladimir Khovaylo	National University of Science and Technology "MISiS"	Hiroyuki Miki	Tohoku University
J21I094	Prediction and design methodology of axisymmetric shock reflection in supersonic flow	Hideaki Ogawa	Kyushu University	Kiyonobu Ohtani	Tohoku University
J21I095	Elucidation of mechanisms on vascular diseases by integration of computational fluid dynamics analysis and cellular experiment	Suguru Miyauchi	University of Miyazaki	Kenichi Funamoto	Tohoku University
J21I098	Towards Next Generation CFD Models of Intracranial Aneurysm (NX-CFD): In-vitro validation studies and in-silico benchmarking of intracranial transitional flow	Khalid M. Saqr	Arab Academy for Science, Technology and Maritime Transport	Makoto Ohta	Tohoku University
J21I099	Application of core-based inversion to reconstruct stress field in an underground geoscience laboratory	Takatoshi Ito	Tohoku University	Ma Xiaodong	ETH Zürich
J21I100	Tensile Effect by Wall Shear Stress around Stagnation Point and Flow Instability by Wall Elasticity in Full-Scale Patient-Specific Aneurysm Model	Gaku Tanaka	Chiba University	Makoto Ohta	Tohoku University

78 selected projects

List of selected projects for International Multiple Collaborative Research Project 2021, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember(Institution)
J21R001	Endovascular stent and vessel remodeling	Aike Qiao	Beijing University of Technology	Makoto Ohta(Tohoku University), Song Hongfang (Capital Medical University), Fu Wenyu (Beijing Union University)
J21R002	An electrically efficient self-sustained microcombustion/flame-assisted fuel cell (FFC) system	Jeongmin Ahn	Syracuse University	Kaoru Maruta(Tohoku University), Milcarek Ryan (Arizona State University)
J21R003	Modeling on boiling and bubble dynamics induced by laser emitted from optical fiber	Junnosuke Okajima	Tohoku University	Roman Fursenko (Institute of Theoretical and Applied Mechanics, Siberian Branch of the Russian Academy of Sciences), Sergey Mokrin (Far-Eastern Federal University), Vladimir Gubernov (Lebedev Physical Institute of the Russian Academy of Sciences), Sergey Minaev (Far Eastern Branch of the Russian Academy of Sciences)
J21R004	An efficient algorithm of inlet turbulence generation for cross-platform-based parallel computation and its application for flows	Yoshiaki Abe	Tohoku University	Vincent Peter (Imperial College London), Freddie Witherden (Texas A&M University), Brian Vermeire (Concordia University), Kazuhiko Komatsu (Tohoku University), Kozo Fujii (Tokyo University of Science)

4 selected projects

List of selected projects for Priority Collaborative Research Project 2021, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember(Institution)
J21J001	Science of ultrafine drop and high speed impact	Takehiko Sato	Tohoku University	Masao Watanabe(Hokkaido University), Takeru Yano(Osaka University)

1 selected project

List of selected projects for Special International Collaborative Research Project 2021, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J21T001	Development of measurement method of high-speed micro mist in environmental energy devices	Takehiko Sato	Tohoku University	James S. Cotton	McMaster University
J21T002	Online monitoring of pipe wall thinning by electromagnetic nondestructive testing	Tetsuya Uchimoto	Tohoku University	Shejuan Xie	Xi'an Jiaotong University

2 selected projects

List of selected projects for LyC Collaborative Research Project 2021, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J21Ly01	Strengthening mechanism of TiC particle reinforced Al matrix composite	Hiroki Kurita	Tohoku University	Sho Takeda	Tohoku University
J21Ly02	Stability of jet diffusion flames cofiring with carbon-free ammonia	Hideaki Kobayashi	Tohoku University	Cedric Galizz	INSA Lyon
J21Ly03	TATAMI: "Thermal AcTuation and energy hArvesting using MultIphysic alloys"	LALLART Mickael	LGEF INSA Lyon	Hiroyuki Miki	Tohoku University
J21Ly04	Microfluidic Tools to Study Aerotaxis in Eukaryotic Cells	Rieu Jean-Paul	University Claude Bernard Lyon 1	Kenichi Funamoto	Tohoku University
J21Ly05	Coupled computing of fluid-structure interaction problems for multiphase energy systems	Jun Ishimoto	Tohoku University	Thomas Elguedj	INSA Lyon
J21Ly06	Response Characteristics of Cellulose Nanofibril under AC Electric Field	Hidemasa Takana	Tohoku University	Florent Dalmas	INSA Lyon
J21Ly07	Numerical Simulations of Protoplasmic Streaming Interacting with Biological Materials	Shuta Noro	National Institute of Technology , Sendai College	Tetsuya Uchimoto	Tohoku University
J21Ly08	Numerical modelling of the particle temperature evolution during cold-spray process	BERNARD Chrystelle	Frontier Research Institute for Interdisciplinary Sciences	Hidemasa Takana	Tohoku University
J21Ly09	Multiscale simulation of carbon electromigration in iron	Takashi Tokumasu	Tohoku University	Patrice Chantrenne	INSA Lyon
J21Ly10	Stability and Transition to Turbulence of Taylor Vortex in a Gap between Rotating Two Cones	Takahiro Adachi	Akita University	Atsuki Komiya	Tohoku University
J21Ly11	MAGIC: "Magnetic AGing in ferromagnetIC"	Benjamin DUCHARNE	ELyTMaX – INSA Lyon	Tetsuya Uchimoto	Tohoku University
J21Ly12	Active Control of Protein Mass Transfer by Membrane Utilizing Variation of Surrounding Condition	Atsuki Komiya	Tohoku University	Sebastien Livi	INSA Lyon
J21Ly13	Ionic Liquid Polymer for corrosion resistance applications	Mary Nicolas	MATEIS Lab, INSA Lyon	Tetsuya Uchimoto	Tohoku University

13 selected projects