List of selected projects for General Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J20I001	Numerical Simulation of a Thermal Plasma Reactor for the Wastes to Energy	Sooseok Choi	Jeju National University	Hidemasa Takana	Tohoku University
J20I002	Numerical Simulations as Evaluation Method for Biofluidic Experiments	Narendra Kurnia Putra	Institut Teknologi Bandung	Hitomi Anzai	Tohoku University
J20I003	Study on fundamental combustion characteristics of Jatropha surrogate fuel	Willyanto Anggono	Petra Christian University	Akihiro Hayakawa	Tohoku University
J20I004	Numerical study on transonic flow characteristics over return capsules	Bok Jik Lee	Seoul National University	Hiroki Nagai	Tohoku University
J20I005	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
J20I007	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
J20I008	The dynamic behavior of marine ecosystems in the complex flows	Evgeniy Dats	Institute of Applied Mathematics FEB RAS	Junnosuke Okajima	Tohoku University
J20I009	The study on the Mechanism of Coupling Wall-Effect on Multidirectional Wings based on Multi-Objective Optimization	Chenguang Lai	Chongqing Institute of Automobile, Chongqing University of Technology	Shigeru Obayashi	Tohoku University
J20I010	Scattering properties of gas molecules on interfaces of nanostructures using molecular dynamics analysis	Takashi Tokumasu	Tohoku University	Hideki Takeuchi	National Institute of Technology,Kochi College
J20I011	Development of pressure measurement method in laser-caviation bubbles	Takehiko Sato	Tohoku University	Mohamed Farhat	Ecole Polytechnique Federale de Lausanne (EPFL)
J20I014	Mechanism of high speed propagation of underwater streamer	Takehiko Sato	Tohoku University	Seiji Kanazawa	Oita University
J20I015	Data-driven kriging-variant characterization and construction for complex aerospace problems	Rhea Liem	Hong Kong University of Science and Engineering (HKUST)	Koji Shimoyama	Tohoku University
J20I016	Development of Deep Gaussian Processes for Complex Fluid-Structure Interaction Problems	Lavi Rizki Zuhal	Bandung Institute of Technology	Koji Shimoyama	Tohoku University
J20I018	Solid Oxide Fuel Cells Replacement of a Traditional Catalytic Converter	Jeongmin Ahn	Syracuse University	Hisashi Nakamura	Tohoku University
J20I020	Electric Field Measurements in Nanosecond Pulse Discharges in Atmospheric Pressure Flames for Plasma Assisted Flameholding	Hidemasa Takana	Tohoku University	Igor Adamovich	The Ohio State University
J20I021	Evaluation of Defects In CFRP Material Based on High Freqnency Eddy Current Testing Method	Chen Zhenmao	Xi’an Jiaotong University	Tetsuya Uchimoto	Tohoku University
J20I022	New parameterization methods for uncertainty quantification of geothermal reservoir models	Anna Suzuki	Tohoku University	Nicholson, Ruanui	The University of Auckland
J20I023	Qualitative density measurement of wake region behind re-entry capsule	Masanori Ota	Chiba University	Hiroki Nagai	Tohoku University
J20I024	Development of multi-color PSP technique for ballistic range experiments	Daiju Numata	Tokai University	Kiyonobu Ohtani	Tohoku University
J20I025	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
J20I026	Large-scale simulation of mass transfer with solid-gas reaction in porous material with actual structure	Yohsuke Matsushita	Tohoku University	Atsuki Komiya	Tohoku University
J20I028	Active control of high-speed boundary layer flows	Yuji Hattori	Tohoku University	Adrian Sescu	Mississippi State University
J20I030	Development and application of numerical method for various particulate flows	Shun Takahashi	Tokai University	Shigeru Obayashi	Tohoku University

List of selected projects for General Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J20I032	Instability and Wave Interactions in Helical Vortices	Yuji Hattori	Tohoku University	Ivan Delbende	LIMSI
J20I033	Experimental and Numerical Study of Shock Wave Attenuation	SAKAI Takeharu	Tottori University	Kiyonobu Ohtani	Tohoku University
J20I034	Development of accurate temperature measurement method by infrared camera	Takuma Kogawa	National Institute of Technology,Hachinohe College	Junnosuke Okajima	Tohoku University
J20I035	Numerical simulation of flowfields over Mars entry capsules	Michiko Furudate	Chungnam National University	Hiroki Nagai	Tohoku University
J20I036	Improvement of Aerodynamic Performance of Flying Object Clothed with Fabrics of Air Permeability	Hiroaki Hasegawa	Utsunomiya University	Shigeru Obayashi	Tohoku University
J20I037	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
J20I039	Flight attitude stabilizing by side-jet generated by detached shock pulsation	Toshiharu Mizukaki	Tokai University	Kiyonobu Ohtani	Tohoku University
J20I040	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
J20I041	Modelling Core Scale: Investigation of Multiscale porosity using 3D printed micromodels	Anna Suzuki	Tohoku University	Maes, Julien	Heriot-Watt University
J20I042	Development of a method for optimizing the rheological and optical properties of blood mimicking fluids	Tupin Simon Andre	Tohoku University	Mazeau, Karim	CERMAV-CNRS
J20I044	Towards Next Generation CFD Models of Intracranial Aneurysm (NX-CFD): In-vitro validation studies and in-silico benchmarking of intracranial transitional flow	Tupin Simon Andre	Tohoku University	Saqr, Khalid M.	Arab Academy for Science, Technology and Maritime Transport
J20I045	Fuel sensitivity on end-gas autoignition behavior during knocking combustion	Hiroshi Terashima	Hokkaido University	Hisashi Nakamura	Tohoku University
J20I047	The Effect of Hypertension and Anti-Coagulant to Aneurysm Rupture	Kahar Osman	Universiti Teknologi Malaysia	Makoto Ohta	Tohoku University
J20I048	Effects of pulsatile flow on endothelial permeabilty and cell motility	Eugenia Corvera Poire	National Autonomus University of Mexico	Kenichi Funamoto	Tohoku University
J20I049	Effects of heat loss on the dynamics of hydrogen-air premixed flames	Satoshi Kadowaki	Nagaoka University of Technology	Hideaki Kobayashi	Tohoku University
J20I052	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
J20I053	Mathematical modeling of the glycocalyx based on the molecular dynamics for blood flow analysis considering microstructures on blood vessel walls	Suguru Miyauchi	Tohoku University	Yiannis Ventikos	University College London
J20I054	Development of thermal barrier fire extinguishing devices	Hiroki Gonome	Yamagata University	Junnosuke Okajima	Tohoku University
J20I055	Development of Spinning Device Using Filmwise Pumping-up Mechnism with Induction Heating and Rotating Cone	Adachi Takahiro	Akita University	Junnosuke Okajima	Tohoku University
J20I056	Characteristics of high enthalpy flows around a hypersonic vehicle	Gouji Yamada	Tokai University	Kiyonobu Ohtani	Tohoku University
J20I057	Numerical study on gas lubrication system using micro/nanoscale dimples	Shigeru Yonemura	Tohoku University	Bondar, Yevgeniy	ITAM SB RAS
J20I059	Experimental observation and numerical simulation toward smart control of suspension rheology	Tomohiro Fukui	Kyoto Institute of Technology	Kenichi Funamoto	Tohoku University
J20I062	Unsteady Aerodynamics of Axially Oriented Low Fineness Ratio Cylinders	Colin Britcher	Old Dominion University	Shigeru Obayashi	Tohoku University

List of selected projects for General Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J20I063	The Role of Signal-anchor Region of Type II Transmembrane Protein in Subcellular Localization	Yuri Mukai-Ikeda	Meiji University	Makoto Ohta	Tohoku University
J20I064	Buoyant magnetic filaments	Stefan Llewellyn Smith	University of California, San Diego	Yuji Hattori	Tohoku University
J20I065	Numerical simulation of GaN-based high-electron-mobility transistors fabricated by neutral beam etching	Yiming Li	National Chiao Tung University	Seiji Samukawa	Tohoku University
J20I068	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
J20I069	Development of Numerical Modeling on Enhancement of CO2 Absorption by Ionic Liquid Electrospray	Hidemasa Takana	Tohoku University	Takayasu Fujino	University of Tsukuba
J20I070	Novel experimental-computational research framework for in-depth understanding of cancer mechanobiology	Ryo Torii	University College London	Kenichi Funamoto	Tohoku University
J20I071	Theoritical simulation on epitaxial growth of functioning thin film	Satoru Kaneko	Kanagawa Institute of Industrial Science and Technology	Takashi Tokumasu	Tohoku University
J20I073	Study of hydrothermal behaviors of impinging droplets on a heated wall	Takahiro Okabe	Hirosaki University	Junnosuke Okajima	Tohoku University
J20I074	Ultra-fine surface roughness effect on boundary layer transition	Aiko Yakeno	Tohoku University	Nugroho, Bagus	Melbourne University
J20I075	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
J20I076	Estimation of fracture permeability by integrating microseismic observational data and reservoir engineering modeling	Yusuke Mukuhira	Tohoku University	Rubinstein, Justin	United States Geological Survey
J20I077	Fluid dynamics and energy/scalar transport in coexisting flow of turbulence and non-turbulence	Yasuhiko Sakai	Nagoya University	Toshiyuki Hayase	Tohoku University
J20I078	Experimental and Chemical Kinetics Modeling Study of nitromethane in shock tubes and a micro-flow reactor with a controlled temperature profile	Olivier Mathieu	Texas A&M University	Hisashi Nakamura	Tohoku University
J20I079	Characterisation and behaviour of centreline shock reflection in axisymmetric supersonic intakes	Hideaki Ogawa	Kyushu University	Kiyonobu Ohtani	Tohoku University
J20I081	Numerical molecular analysis of reactive species behavior bewteen discharge plasma and biological surface	Satoshi Uchida	Tokyo Metropolitan University	Takehiko Sato	Tohoku University
J20I082	An Innovative Method of Generating Plasma Microbubbles in Flowing Water	Jong-Shinn Wu	National Chiao Tung University	Takehiko Sato	Tohoku University
J20I083	Individual effects of plasma-generated electrical field, short-life species, and long-life species on cell-3rd year	Yun-Chien Cheng	National Chiao Tung University	Takehiko Sato	Tohoku University
J20I084	A study on nano-scale interfacial phenomena of surface-modified nanoparticle suspensions	Takao Tsukada	Tohoku University	Atsuki Komiya	Tohoku University
J20I087	Numerical study on wind instruments with compressible DNS	Kin'ya Takahashi	Kyushu Institute of Technology	Yuji Hattori	Tohoku University
J20I088	Development of sonic boom evaluation function under real meteorological conditions	Hiroshi YAMASHITA	Deutsches Zentrum für Luft- und Raumfahrt (DLR)	Shigeru Obayashi	Tohoku University
J20I089	Study on MHD phenomena in Co-axial MHD Energy Conversion Device	Hiromichi Kobayashi	Keio University	Hidemasa Takana	Tohoku University
J20I091	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
J20I092	MD analysis of formation process of PEFC's catalyst layer	Wakashima Shin-ichiro	National Institute of Technology,Ichinoseki College	Takashi Tokumasu	Tohoku University

List of selected projects for General Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J20I093	Integrated analysis of an aircraft body and an operating engine	Kazuhisa Chiba	The University of Electro-Communications	Shigeru Obayashi	Tohoku University
J20I094	Study on improvement of washing effect for textile using the underwater explosion	Kazutaka Kitagawa	Aichi Institute of Technology	Kiyonobu Ohtani	Tohoku University
J20I095	3D Human Blood-Brain Barrier Chip for CNS Drug Development	Masanori Tachikawa	Tokushima University	Kenichi Funamoto	Tohoku University
J20I096	On the multi dynamic mode analysis of flow-induced noise from an elasticbodies	Osamu Terashima	Toyama Prefectural University	Yasufumi Konishi	Tohoku University
J20I097	Evaluation of Natural Convection Flow under Spatiotemporally Variable Thermal Condition	Atsuki Komiya	Tohoku University	Nicholas Williamson	The University of Sydney
J20I099	Experimental study on structural shape of conductive tether for removing space debris	Kanjuro Makihara	Tohoku University	Kiyonobu Ohtani	Tohoku University
J20I100	Application of core-based inversion to reconstruct stress field in an underground geoscience laboratory	Takatoshi Ito	Tohoku University	Ma Xiaodong	ETH Zürich
J20I101	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
J20I102	Interferometric measurement of temperature fields in turbulent flows	Juan Felipe Torres	Australian National University	Atsuki Komiya	Tohoku University
J20I103	Data-driven modeling of flow in complex structures	Anna Suzuki	Tohoku University	Minto, James	University of Strathclyde
J20I104	Multidimensional Aerodynamic-Flight Simulation for Mars Airplane Balloon Experiment and Investigation of Its Flight Characteristics by Aerodynamic Control Optimization	Masahiro Kanazaki	Tokyo Metropolitan University	Hiroki Nagai	Tohoku University
J20I105	Optical characterization of ionic liquid upon its absorption of carbon dioxide gas	Rei Furukawa	The University of Electro-Communications	Hidemasa Takana	Tohoku University
J20I107	Numerical analysis of a morphing slotted jet flap	Dzieminska Edyta	Sophia University	Shigeru Obayashi	Tohoku University
J20I109	Active and passive controle of unsteady cavitation on a hydrofoil	Yuka Iga	Tohoku University	Ebrahim Kadivar	University of Duisburg-Essen
J20I110	A machine-learning approach for computation of cardiovascular function parameters from pulse wave of limbs	Xiaorui Song	Shandong First Medical University & Shandong Academy of Medical Sciences	Makoto Ohta	Tohoku University

84 selected projects

List of selected projects for International Multiple Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFSresponsible member(Institution)
J20R001	Endovascular stent and vessel remodeling	Aike Qiao	Beijing University of Technology	Makoto Ohta(Tohoku University), Hongfang Song(Capital Medical University), Wenyu Fu(Beijing Union University)
J20R002	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)
J20R003	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(Institute for Applied Mathematics, Far Eastern Branch of the Russian Academy of Sciences), Andriushenko Petr(Institute for Applied Mathematics, Far Eastern Branch of the Russian Academy of Sciences, Russia)
J20R004	An efficient algorithm of inlet turbulence generation for cross-platform-based parallel computation and its application for flows	Yoshiaki Abe	Tohoku University	Peter Vincent(Imperial College London), Freddie Witherden(Texas A&M University), Brian Vermeire(Concordia University)

4 selected projects

List of selected project for Priority Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsible member or non-IFSresponsible member(Institution)
J20J001	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 LyC Collaborative Research Project 2020, IFS, Tohoku University

Project Code	Project Title	Applicant	Institution	IFS responsiblemember or non-IFS responsiblemember	Institution
J20Ly01	Microfluidic Tools to Study Aerotaxis in Eukaryotic Cells	Rieu Jean-Paul	University Claude Bernard Lyon 1	Kenichi Funamoto	Tohoku University
J20Ly02	Ionic Liquid Polymer for corrosion resistance applications	Mary Nicolas	ELyTMaX, CNRS, Tohoku University, Université de Lyon	Tetsuya Uchimoto	Tohoku University
J20Ly03	Numerical modelling of particle-laden effect on supersonic flow for cold-spray polymer coating	BERNARD Chrystelle	Frontier Research Institute for Interdisciplinary Sciences	Hidemasa Takana	Tohoku University
J20Ly04	Response Characteristics of Cellulose Nanofibril under AC Electric Field	Hidemasa Takana	Tohoku University	Florent Dalmas	INSA-Lyon
J20Ly05	Thermal AcTuation and energy hArvesting using MultIphysic alloys	LALLART Mickael	LGEF INSA Lyon	Hiroyuki Miki	Tohoku University
J20Ly06	Stability of jet diffusion flames cofiring with carbon-free ammonia	Hideaki Kobayashi	Tohoku University	Dany ESCUDIE	INSA-Lyon
J20Ly07	Coupled computing of fluid-structure interaction problems for multiphase energy systems	Jun Ishimoto	Tohoku University	Thomas Elguedj	INSA-Lyon
J20Ly08	Elucidation of the pathophysiology of skin sodium and water metabolism	Rahman Asadur	Kagawa University	Jun Ishimoto	Tohoku University
J20Ly09	Stochastic Fluid Dynamics Simulations for Velocity Distribution of Protoplasmic Streaming	Hiroshi Koibuchi	National Institute of Technology,Sendai College(Natori)	Tetsuya Uchimoto	Tohoku University
J20Ly10	Active Control of Protein Mass Transfer by Membrane Utilizing Variation of Surrounding Condition	Atsuki Komiya	Tohoku University	Sebastien Livi	INSA-Lyon
J20Ly11	Stability and Transition to Turbulence of Taylor Vortex in a Gap between Rotating Two Cones	Takahiro Adachi	Akita University	Atsuki Komiya	Tohoku University

11 selected projects