

# Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures

## 2020-2021 Joint Research Projects I

2020-2021 Joint Research Projects: 52 Projects (88 joint research centers)\*  
International 5, General 47

\* 34 Exploratory Joint Research Projects are adopted as well. (As of May 2020)

Category Legend

NA : Very large-scale numerical computation   
 DA : Very large-scale data processing  
NW : Very large capacity network technology   
 IS : Very large-scale information systems

### International Joint Research Projects

Project Title	Leader (Affiliation)	Category	Joint Research Center
Hierarchical low-rank approximation methods on distributed memory and GPUs	Rio Yokota (Tokyo Institute of Technology)	NA	Hokkaido, UTokyo, Tokyo Tech, Nagoya, Kyoto
High resolution simulation of cardiac electrophysiology on realistic whole-heart geometries	Kengo Nakajima (The University of Tokyo)	NA DA	UTokyo
Development of Fast Surrogate for Approximating Large-scale 3D Blood Flow Simulation	Takashi Shimokawabe (The University of Tokyo)	NA DA	UTokyo
Scalable Multigrid Poisson solver for AMR-based CFD applications in Nuclear Engineering	Naoyuki Onodera (Japan Atomic Energy Agency)	NA	UTokyo, Tokyo Tech, Nagoya
Preparing for Exa-systems: Performance portable implementation and scalable data analysis	Yuuichi Asahi (Japan Atomic Energy Agency)	NA DA	Tokyo Tech, Nagoya

### General Joint Research Projects(1/2)

Project Title	Leader (Affiliation)	Category	Joint Research Center
Large-scale aeroacoustic simulation on wind instruments	Kinya Takahashi (Kyushu Institute of Technology)	NA DA	Nagoya, Kyushu
Development of high-performance parallel code for LES of MHD turbulence	Hideaki Miura (National Institute for Fusion Science)	NA	UTokyo
Development of massively parallelized particle simulation code for fusion plasma research and visualization of the simulation results	Hiroaki Ohtani (National Institute for Fusion Science)	NA	Nagoya, Kyoto
Understanding of hydrogen dynamics and H/D isotope effect in molecular crystals	Masanori Tachikawa (Yokohama City University)	NA	Kyushu
Efficient algorithms for the shortest vector problem using massive parallel computing	Kenji Kashiwabara (The University of Tokyo)	NA	UTokyo
Large scale simulation for turbulent transport of many dispersed particles	Takeshi Watanabe (Nagoya Institute of Technology)	NA	Nagoya
Development and Application of Risk Evaluation for Heat Stroke	Akimasa Hirata (Nagoya Institute of Technology)	NA	Tohoku
Developing Accuracy Assured High Performance Numerical Libraries for Eigenproblems	Takahiro Katagiri (Nagoya University)	NA	UTokyo, Nagoya
Effect of spiral vortices on the turbulent transition in three-dimensional boundary layer formed on a rotating disk	Lee Keunseob (Gifu University)	NA	Tohoku
Dynamics of the finite temperature QCD	Hiroshi Suzuki (Kyushu University)	NA	Osaka, Kyushu
Large-scale phase-field simulations for abnormal grain growth	Tomohiro Takaki (Kyoto Institute of Technology)	NA	Tokyo Tech
Study of QCD matter at high density with GPU code and multiple precision algorithm	Masayuki Wakayama (Kokushikan University)	NA	Osaka
Probabilistic risk analysis using surrogate models obtained by high performance disaster simulations.	Shuji Moriguchi (Tohoku University)	NA	Kyoto
Structure-Property Relationships of Polymeric Materials Based on Data Science	Yoshifumi Amamoto (Kyushu University)	NA	UTokyo, Kyushu
A Fully-explicit Computation for Incompressible Gas-liquid Two-phase Flows with Mesh Refinement Adapting to Interfaces and Implementation on a GPU Supercomputer – Foam Computation using MPF Method –	Takayuki Aoki (Tokyo Institute of Technology)	NA	Kyushu
Study on Multi-scale Space Plasma Simulations with Cross-Reference Framework	Yohei Miyake (Kobe University)	NA	Hokkaido, Kyoto, Kyushu
Machine-learning construction of a model describing macroeconomic behaviors	Yoshitaka Saiki (Hitotsubashi University)	NA DA	UTokyo, Kyoto, Osaka
Construction of a platform for data science of high Reynolds number turbulence	Takashi Ishihara (Okayama University)	NA	Nagoya, Kyushu
Synthetic Population Data Distribution System for Social Data Analysis and Simulation	Tadahiko Murata (Kansai University)	NA DA	Hokkaido, UTokyo, Osaka
A quantitative evaluation of the resilience with a wide-area distributed platform "Distcloud"	Hiroki Kashiwazaki (National Institute of Informatics)	IS	Tokyo Tech, Kyoto, Osaka

# Joint Usage/Research Center for Interdisciplinary Large-scale Information Infrastructures

## 2020-2021 Joint Research Projects II


2020-2021 Joint Research Projects: 52 Projects (88 joint research centers)※  
International 5, General 47

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### Category Legend

 NA : Very large-scale numerical computation	 DA : Very large-scale data processing
 NW : Very large capacity network technology	 IS : Very large-scale information systems

## General Joint Research Projects (2/2)

Project Title	Leader (Affiliation)	Category	Joint Research Center
Development and Scalability Evaluation of Distributed Deep Learning Framework for Extremely Large Neural Networks	Masahiro Tanaka (National Institute of Information and Communications Technology)	 IS	UTokyo
Numerical simulation on injectors of rotating detonation engines	Akiko Matsuo (Keio University)	 NA	Tohoku
Development of efficient boundary integral equation method and application to gigantic earthquake simulations	Ryosuke Ando (The University of Tokyo)	 NA	UTokyo
Mechanism for meson mass generation in lattice QCD with chiral fermion	Motoo Sekiguchi (Kokushikan University)	 NA	Osaka
Developing Monte Carlo codes available for high-density 2-color QCD as a way to determine the phase diagram	Kei Iida (Kochi University)	 NA	Kyoto, Osaka
Intrinsic magnetic superconductivity and supercurrent in external magnetic field vertical to intrinsic magnetization	Hirono Kaneyasu (University of Hyogo)	 NA	Osaka
Constructions of fundamental theory in particle methods and their expansion to multiphysics simulator	Masao Ogino (Daido University)	 NA	Nagoya, Kyushu
Development of Fluid-Structure Interaction Analysis for Aortic Dissection Risk Assessment	Ryo Takeda (Hokkaido University)	 NA	Hokkaido
Numerical Methods with High-Performance, Trans Precision and High Reliability	Kengo Nakajima (The University of Tokyo)	 NA	UTokyo
Combination of HPC and high-speed data transfer technologies for big-data processing systems	Takeshi Murata (National Institute of Information and Communications Technology)	 DA  NW  IS	Tohoku, UTokyo, Nagoya, Kyoto, Kyushu
Mechanism of heat exchange of complicated structures by two-phase heat and fluid flow simulation	Masayuki Kaneda (Osaka Prefecture University)	 NA	Tokyo Tech
Performance evaluation of airplane engines with high fidelity to flight conditions – for accomplishing integrated fluid computations of operating engines and airframes	Haruki Ishikawa (The University of Electro-Communications)	 NA	Hokkaido, Osaka
Innovative Multigrid Methods II	Akihiro Fujii (Kogakuin University)	 NA	Hokkaido, UTokyo, Nagoya
Study of computer-assisted detection of lesions in medical images using Deep Learning	Sato Issei (The University of Tokyo)	 DA	UTokyo
Performance Prediction Techniques for Numerical Methods in the Exascale Era	Takeshi Fukaya (Hokkaido University)	 NA	Hokkaido, UTokyo
Toward large-scale medical image processing by using distributed machine learning	Satoshi Ohshima (Nagoya University)	 DA	UTokyo, Nagoya
Construction of Hybrid Cloud System and Genome Data Transfer among Multiple Regions	Masao Nagasaki (Kyoto University)	 NW	UTokyo, Kyoto, Kyushu
Study on scalar transport in complex turbulent flows by large-scale numerical simulation	Tatsuya Tsuneyoshi (Nagoya University)	 NA	Nagoya
Detailed analyses of early Universe in lattice QCD numerical simulations	Masakiyo Kitazawa (Osaka University)	 NA	Osaka
Enhancement of ensemble simulation and data assimilation for plume analysis code	Yuta Hasegawa (Japan Atomic Energy Agency)	 NA	Tokyo Tech
Development of numerical methods for elastic wave propagation in heterogeneous and anisotropic materials and their application to nondestructive inspection	Takahiro Saitoh (Gunma University)	 NA	Kyoto
Waveform tomography of the structure model in the source region of the 2011 Tohoku-Oki earthquake by using large-scale seismic-wave simulations	Taro Okamoto (Tokyo Institute of Technology)	 NA	Tokyo Tech, Nagoya
Estimation of building energy demand based on activity simulation of national population	Yohei Yamaguchi (Osaka University)	 NA	Osaka
Enhancement of the GW space-time code for treatment of organic-metal interfaces	Susumu Yanagisawa (University of the Ryukyus)	 NA	Tohoku
Real-time forecast experiments on sudden local severe storms	Takemasa Miyoshi (RIKEN)	 NA	UTokyo
Improvement of the accuracy for predicting wind environment based on machine learning and its application to disaster prevention technology	Youhei Takagi (Yokohama National University)	 NA	UTokyo, Nagoya
Visualization and Statistical Modeling of Financial Big Data	Masayuki Jimichi (Kwansei Gakuin University)	 NW	UTokyo