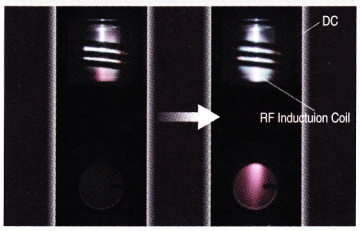
Organization Chart (Research Divisions and Laboratories)

[Advanced Flow Division]

We investigate both the fluid dynamics phenomena that appear when the physical environment is pushed to its limits in terms of speed, temperature, pressure, gravity and the fluid dynamics phenomena that appear in environments combining these extreme conditions.

- Investigation of combustion reaction flow phenomena in supersonic flows and high pressure and zero gravity environments
- Investigation and control of the heat and mass transfer and matter and phase change phenomena in extreme non-equilibrium states
- Investigation of the characteristics of super-cold multiphase flow dynamics in order to establish technology that uses cryogenic attributes
- Investigation of the plastic flow of underground rock masses under high pressures and research centering on the measurement of current locations

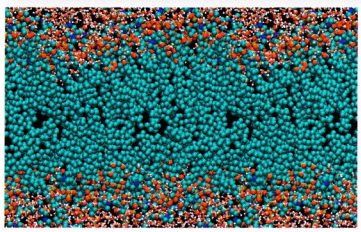
[Intelligent Fluid Systems Division]



We develop "intelligence" in fluids by investigating the correlation between heat, flow, and electromagnetic fields and controlling these phenomena. By applying these phenomena, we create Intelligent Fluid Systems that recognize, evaluate, and behave upon the external environment.

- Heat transfer characteristics of functional fluids that develop intelligence in electromagnetic fields
- Intelligent systems that autonomously adapt to environmental changes
- Investigation of fluid movement phenomena inside the body and research on ergonomic applications
- Research on the functionality assessment of intelligent fluid systems

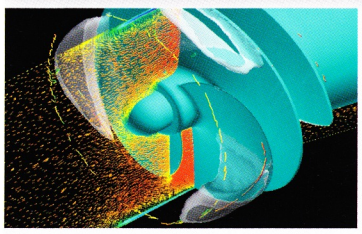
[Non-continuum Flow and Heat Transfer Division]



We investigate thermal and fluid phenomena by analyzing dynamics of electrons and molecules. Through the analyses, elementary processes and factors that determine macroscale fluid characteristics such as thermophysical properties and interfacial phenomena, flow dynamics in nanoscale structures, and interactions between a plasma flow and cells/bacteria are clarified. The theory and concept for design and control of the phenomena to be established by the studies will be the basics of nanoscale fluid technologies.

- Molecular mechanism of energy and mass transfer in liquids, interfaces and membranes
- Molecular gas dynamics study of nanoscale gas lubrication
- Molecular study of transport phenomena of materials in nanoscale structures
- Study of interactions between a plasma flow and cells/bacteria

[Complex Flow Division]



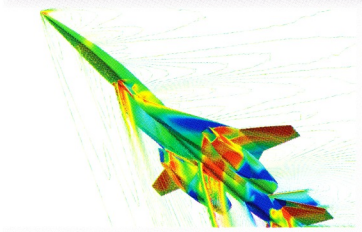
For complex fluid dynamics phenomena that appear in flow with various space and time scales, we are establishing theories about advanced fluid information, analyzing numerical fluid information and experimental fluid information, and working to realize systems to control these phenomena.

- Investigation of the fluid dynamics phenomena for systems that involve complex coupling of multiple physics
- Investigation of fluid phenomena via large scale numerical simulations
- modelling of multi-scale fluid flow in deep subsurface structure and its application
- Applied mathematical research of complex flow fields

[Transdisciplinary Fluid Integration Research Center]

Core Research Division

Targeted Research Division



The TFI research center consists of the core research division and the targeted research division. The center conducts research through a new research methodology integrating experiment and simulation. Using this new integrated research methodology we are solving complex flow problems which were difficult to solve either with experiment or with simulation. In cooperation among researchers and engineers in various fields, we aim to establish a new research field of fluid informatics.

[Advanced Fluid Information Research Center]