Division of Mechanical Science and Engineering	Research field	Thermal Systems	Lab. ID MS05
Laboratory web site	http://www.ms.t.kanazawa-u.ac.jp/~fluid/		

Research subjects

Various thermo-fluid phenomena ranging from low-speed to high-speed are investigated, e.g., [1] Compressible flows around aircrafts and space vehicles, [2] Incompressible flows around bluff bodies such as automobiles, and [3] Renewable energy applications (Geothermal heat exchangers, airfoils of wind turbines, etc.). Irreversibility related to nonequilibrium relaxation processes of galaxy clusters and nano clusters are also studied theoretically and numerically.

Master/Doctor course: Education policy, curriculum, typical activity in the laboratory

* In the first semester of the first grade, graduate students decide their practical subject for the Master or Dotor thesis, through long and heavy discussions with their advisers. * All the students must report on their progress and discuss with the adviser for an hour or more every week. * All the students in the fluid dynamics laboratory (Thermo Systems + Fluid Information) must take part in a weekly seminar for two hours or so. In this seminar, two presenters report on their progress and introduce recent papers related to their researches. After each presentation, the presenter discusses with all the staffs and students in the fluid dynamics laboratory.

Daily life in the laboratory, etc.

We regularly hold various seminars regarding our research subjects. Also, frequent events and discussions between students help to have a fulfilling laboratory life.[M2] My research subject is solidification of metal. To get refreshed, I enjoy basketball and play on a adult basketball team twice a week. [M2] Undergraduate and graduate students enjoy a lively and unrestricted discussion regardless of research subjects. [M2] We study thermo-fluid dynamics phenomena, numerically and experimentally. We enjoy our laboratory life through many laboratory events! [M1]

Message or comments by the laboratory faculty staffs

The laboratory life is long and is expected to be very hard. Undergraduate students who hope to join this laboratory will do better to ask the staff (i.e., Nobuyoshi Komatsu) beforehand.
After taking the master degree, most graduates work in companies related to the manufacturing industry, e.g., Mitsubishi Motors Corporation, Hino Motors, Ltd., etc. After taking the doctoral degree, graduates return their companies because they were in the course of graduate program for working adults.

Recent Master theses in these 3 years (+ more if appropriate)

year.month	Thesis title (including English translation of Japanese thesis title)
2017.3	Fluid-Structure Interactions of two-dimensional membrane airfoils for Micro Air Vehicles
2016.3	Numerical Analysis about output characteristics of The Flow Vector Sensor
2016.3	Control of the solidifying micro-structures and compositions of the hypo-eutectic alloys
2016.3	Numerical modeling of the heat exchanger performance placed in running water flows
2015.3	Aerodynamic analysis of automobiles: Diffuser effect and down force of a simplified car model with an upswept aft section
2015.3	Numerical studies on morning breakup mechanisms
2015.3	Unsteady solidification process over a vertical cylinder and the associated double-diffusive convection
2015.3	Numerical studies on transient natural convection in the annulus between two concentric horizontal cylinders
2014.3	Shear stress measurements on solid surfaces by a micro flow sensor
2013.3	Influence of Leaf-area-density and atmospheric stability on the canopy turbulent structures
2013.3	Influence of casing pipe permeability over the measurements by a single-borehole groundwater velocity probe
2013.3	Double diffusive convection in sodium nitrate solution due to solidification over a vertical cylinder

Recent Doctoral theses in these 3 years (+ more if appropriate)

year.month	Thesis title (including English translation of Japanese thesis title)

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