Liaison Office Panel Session
"Multi-Lateral Research Initiative"

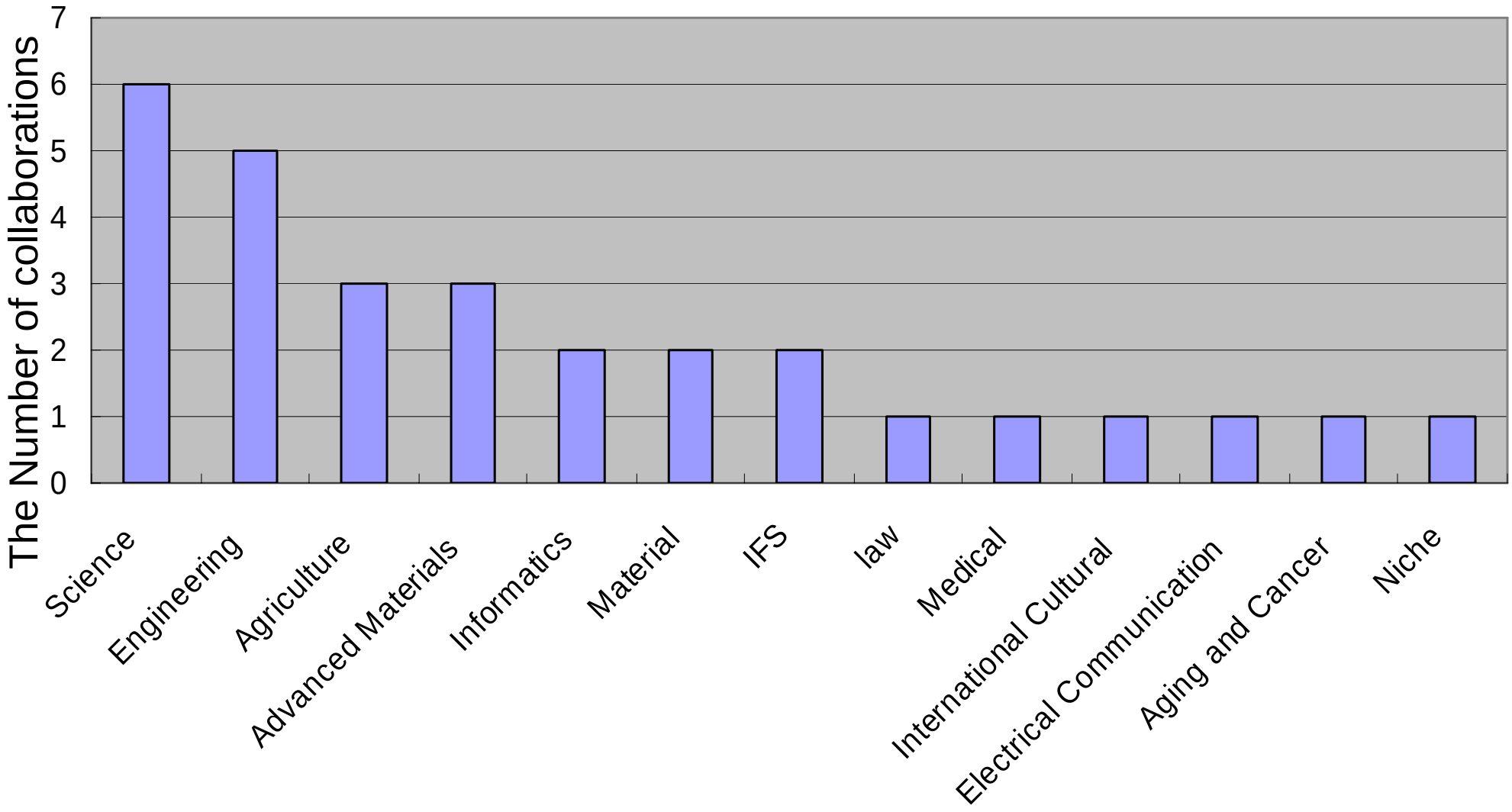
Tohoku University

Prof. S. Maruyama

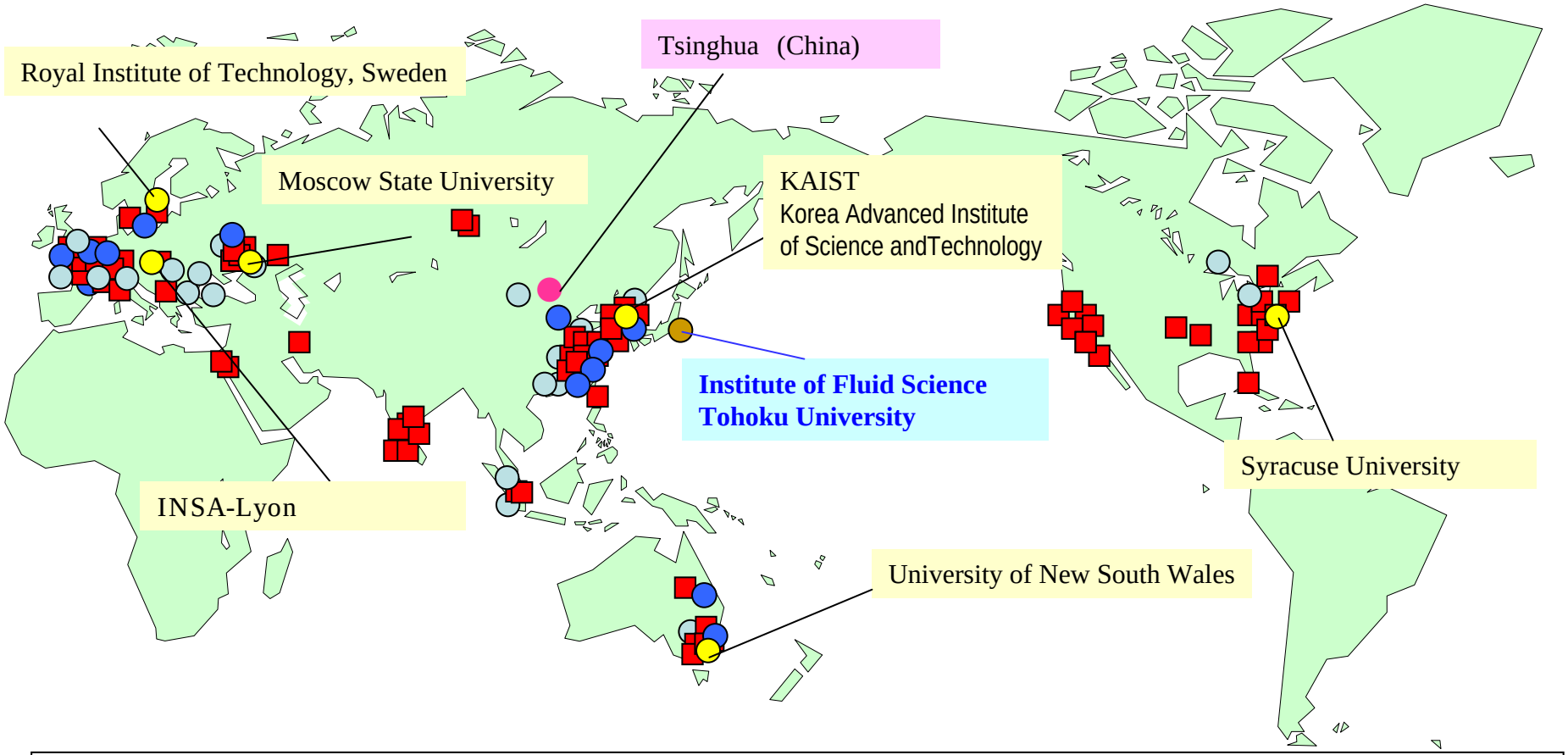
contents

1. Activities of Tohoku University for international collaborations
2. Activities of Institute of Fluid Science for international collaborations
3. Research activities in Institute of Fluid Science
4. Establishment of International consortium of interface fluid dynamics applied to advanced-nanotechnology among leading institute and plan
5. Candidate topics for multi-lateral research through liaison office

International Collaborations Projects in Tohoku University (Departments)

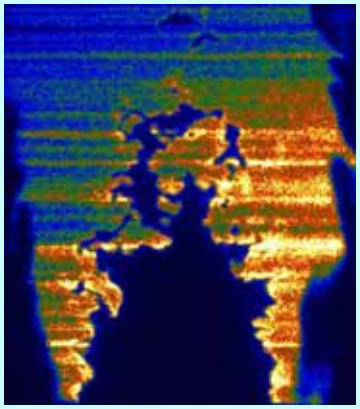


International research activities of the Institute of Fluid Science

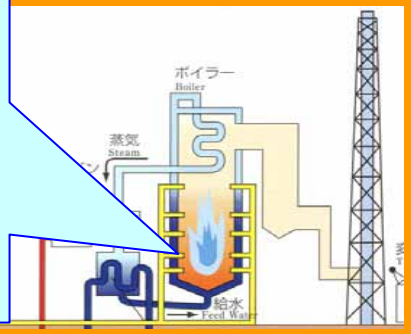


- Liaison offices 7
- Inter-university agreement for educational and research cooperation 19
- Agreement for educational and research cooperation between the IFS and overseas academic organizations 15
- Partners of international collaboration 77

Academic Area

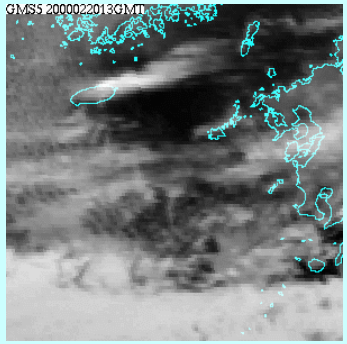


high-pressure turbulent flame



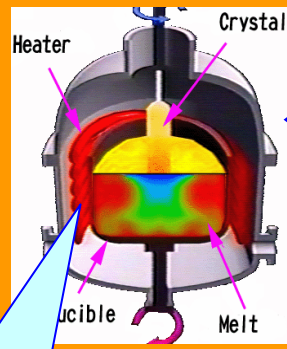
Energy

Environment



Vortex after islands

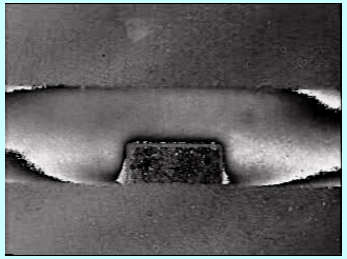
Flow Dynamics



Materials

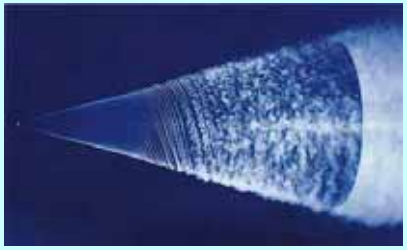
Medicine

Intravascular bloodstream



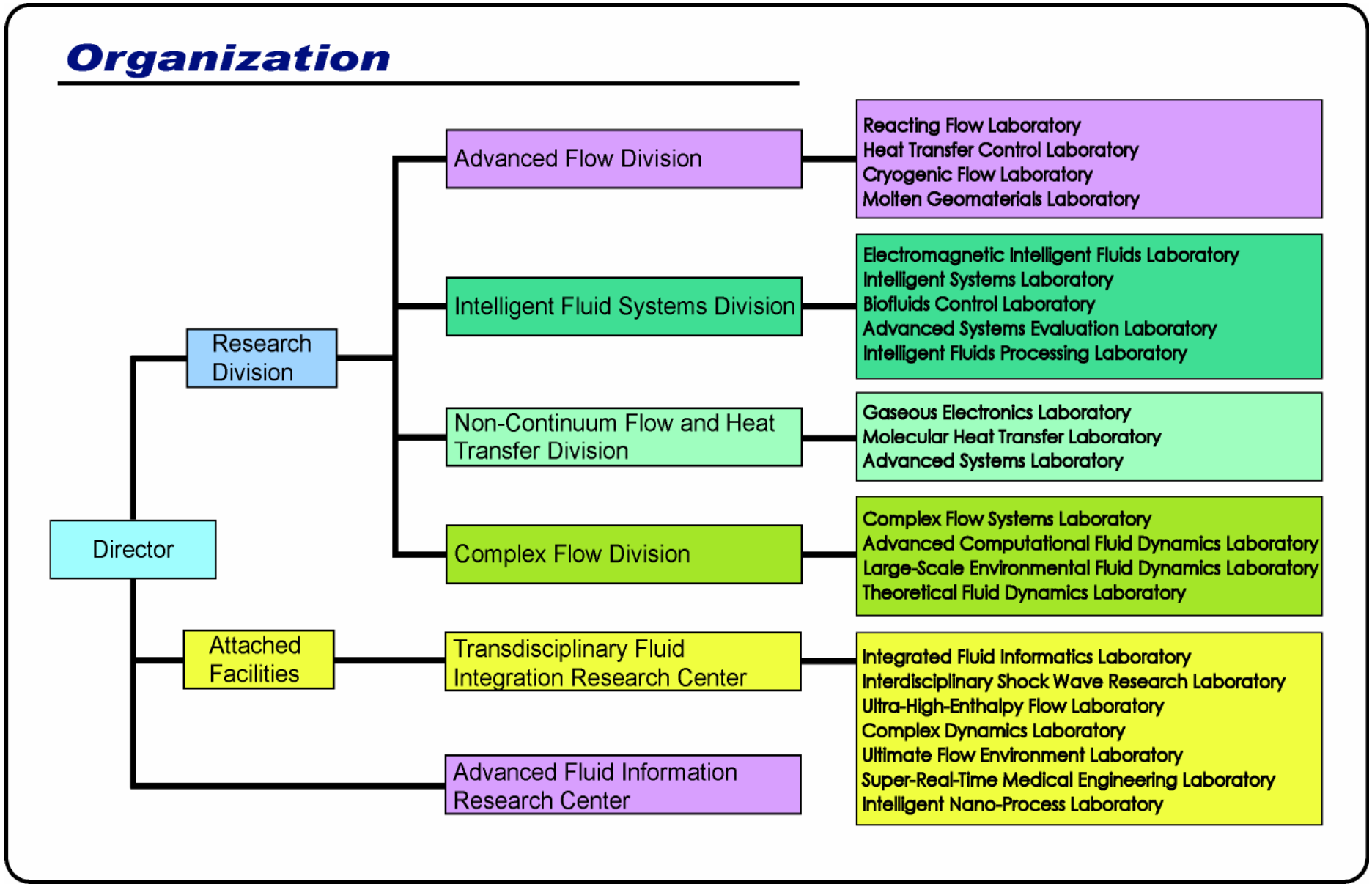
Flows around crystal

Aerospace



Unstable flow on a wing

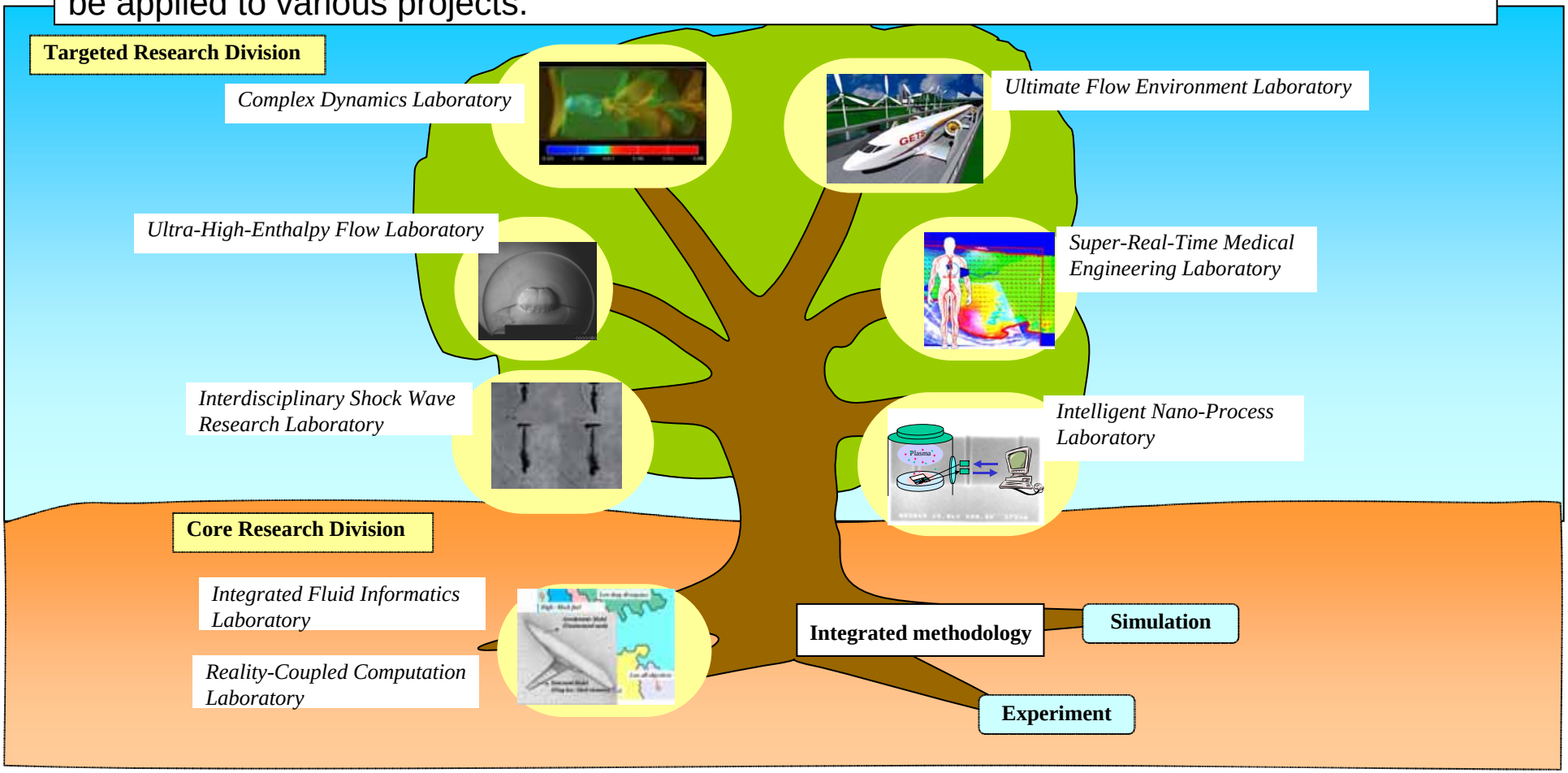
Organization of Institute of Fluid Science



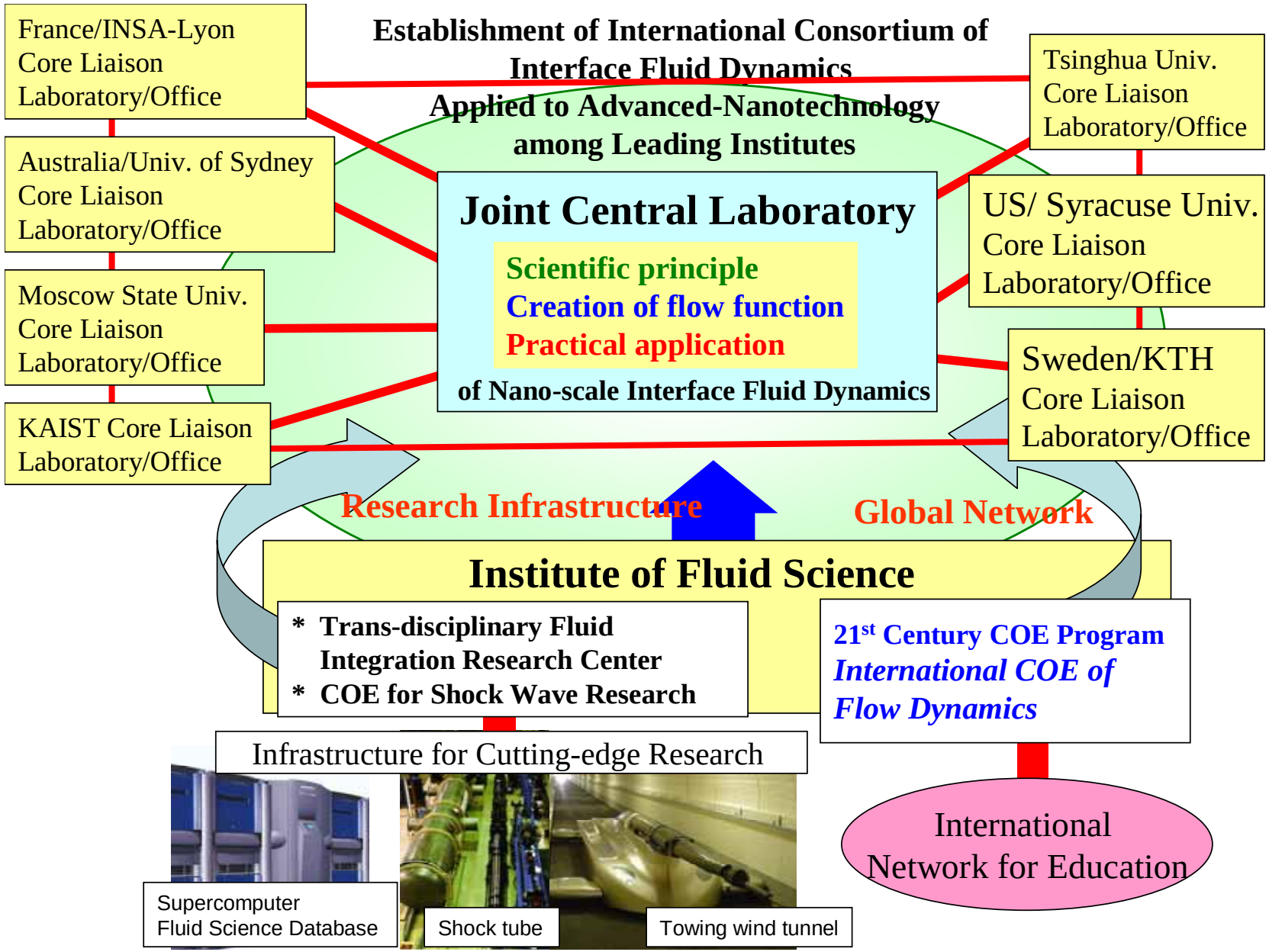
INSTITUTE OF FLUID SCIENCE

Transdisciplinary Fluid Integration Research Center

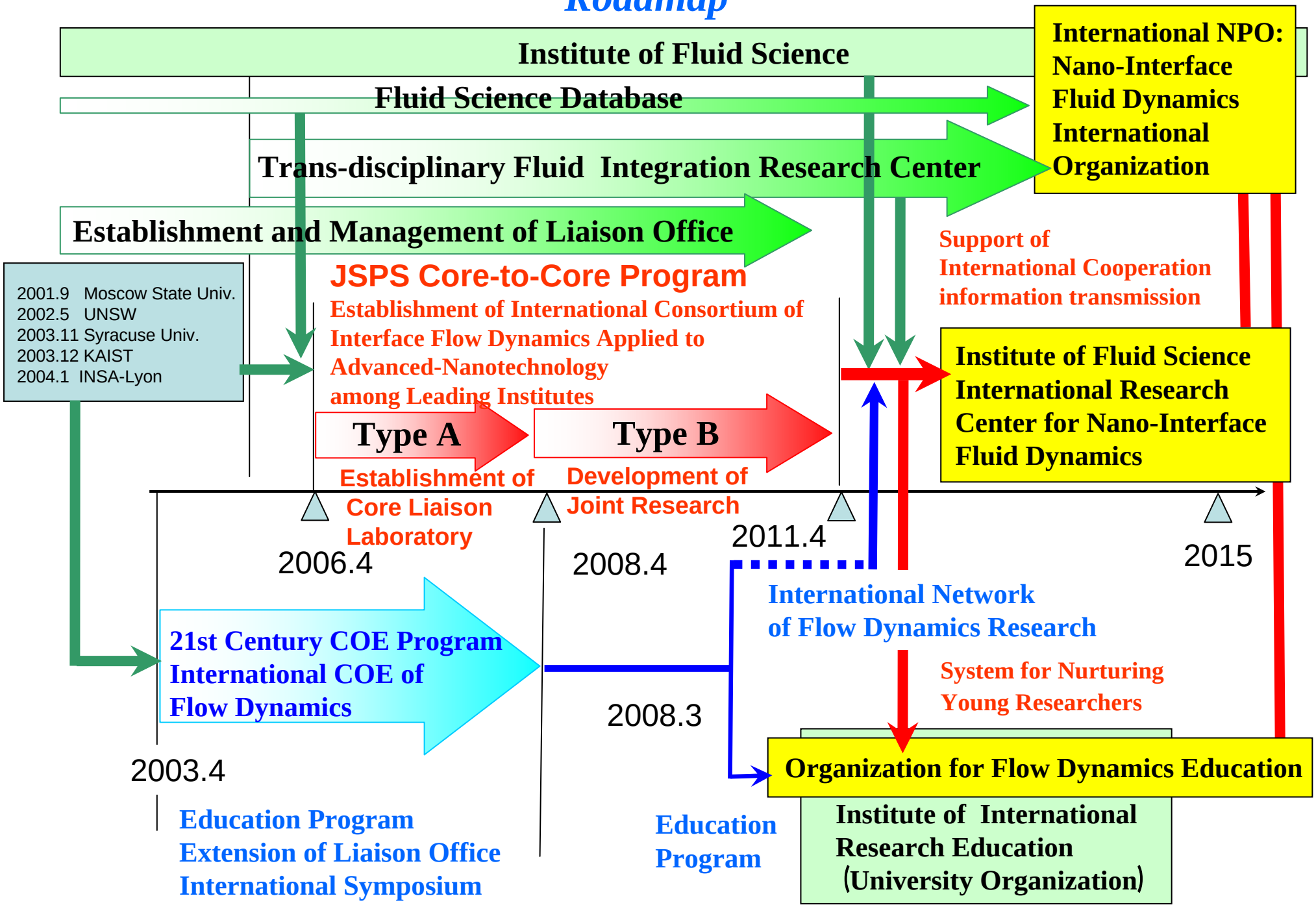
This research center has been established in April 2003 by expanding IFS's Shock Wave Research Center. Integration of experimental and computational approaches leads to super efficiency and accuracy in solving Transdisciplinary Fluid problems in various science and engineering fields essential to sustainable development of human beings. TFI methods will be applied to various projects.



JSPS Core-to-Core Program

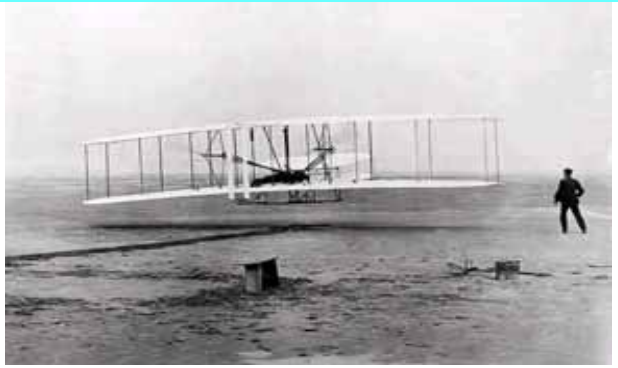


Roadmap

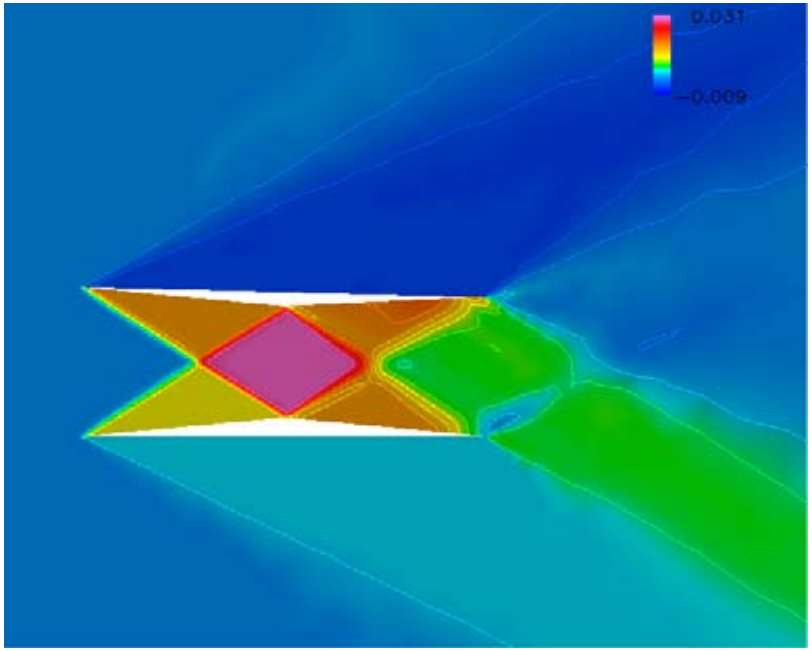

Institute of Fluid Science
Fluid Science Database
Trans-disciplinary Fluid Integration Research Center
Establishment and Management of Liaison Office
International NPO: Nano-Interface Fluid Dynamics International Organization
Support of International Cooperation information transmission
2001.9 Moscow State Univ.
2002.5 UNSW
2003.11 Syracuse Univ.
2003.12 KAIST
2004.1 INSA-Lyon
JSPS Core-to-Core Program
Establishment of International Consortium of Interface Flow Dynamics Applied to Advanced-Nanotechnology among Leading Institutes
Type A
Type B
Establishment of Core Liaison Laboratory
Development of Joint Research
Institute of Fluid Science International Research Center for Nano-Interface Fluid Dynamics
2006.4
2008.4
2011.4
2015
21st Century COE Program International COE of Flow Dynamics
2003.4
2008.3
International Network of Flow Dynamics Research
System for Nurturing Young Researchers
Organization for Flow Dynamics Education
Institute of International Research Education (University Organization)
Education Program
Extension of Liaison Office
International Symposium
Education Program

Boomless Supersonic Transport

- **Proposal of Supersonic Biplane by Busemann's Concept**
- **Prof. Obayashi et al.**



The first airplane
by Wright brothers



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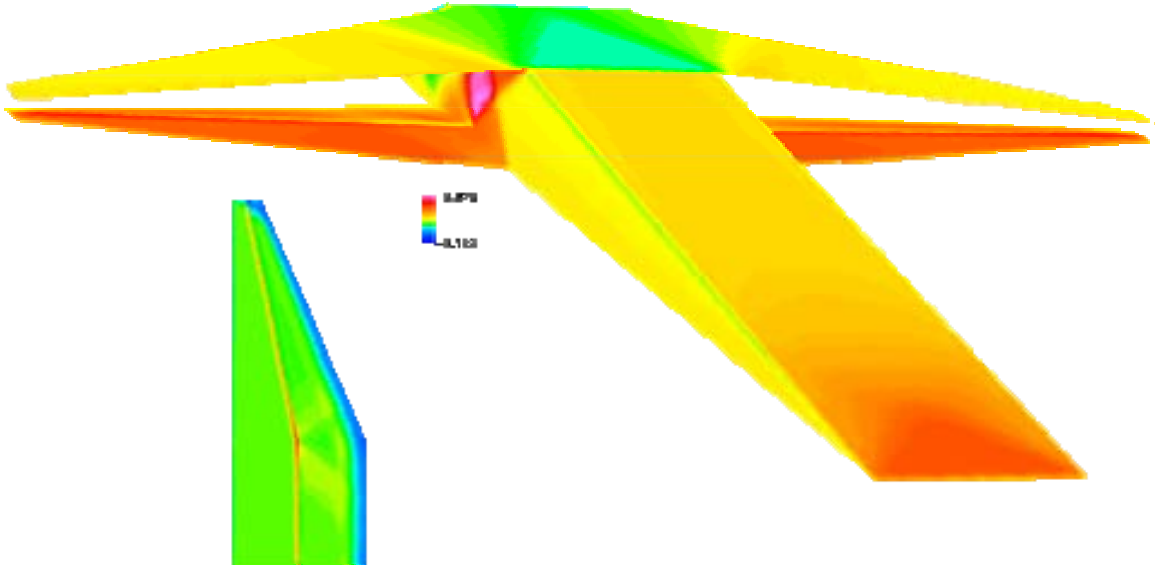
Cl=0.1047, Cd=0.00625, L/D=16.75



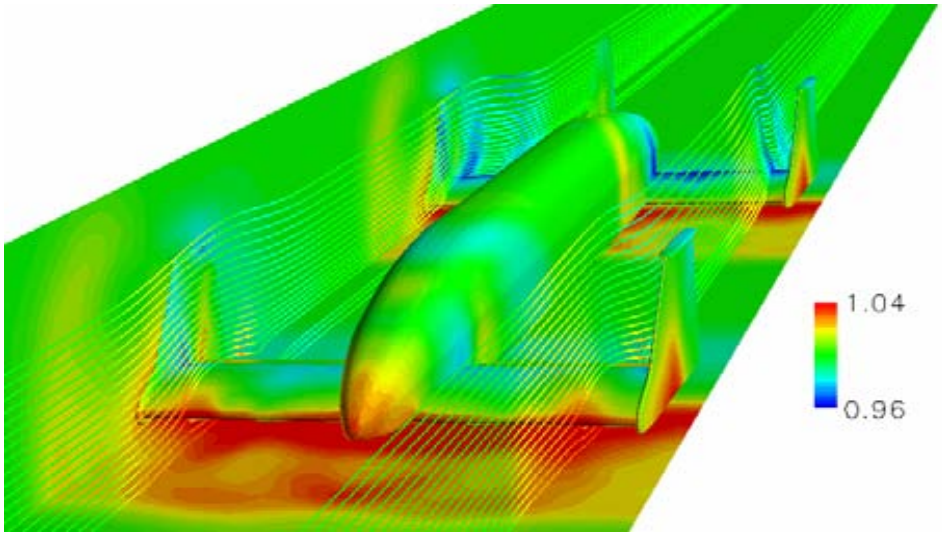
3-D Numerical Simulation

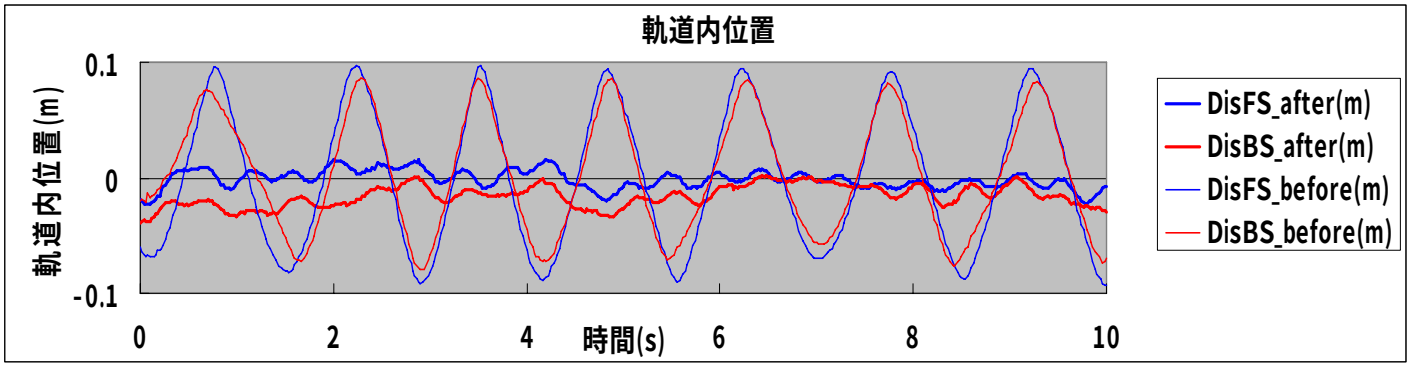
Aero Train

Flight Test of Aero Train Model

Experimental Site in Miyazaki Pref.

CFD Simulation and Optimization

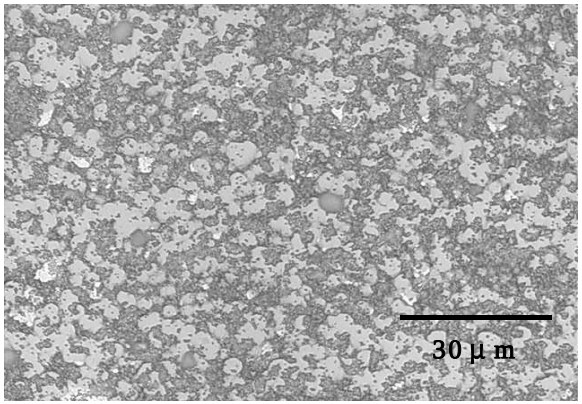


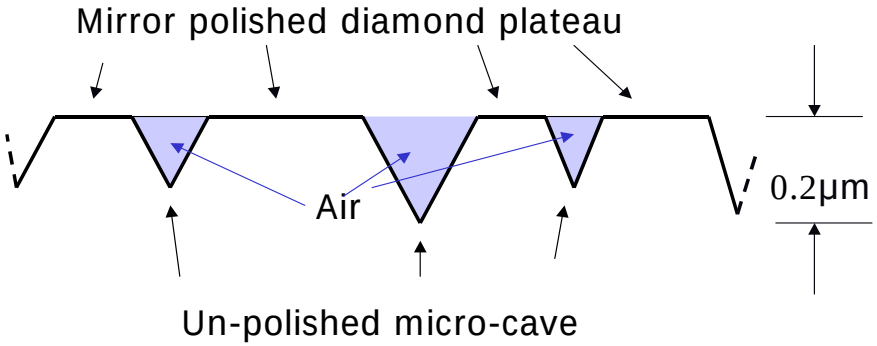


Prof. Y. Kohama, et al.,
IFS, Tohoku Univ.

Development of Diamond Slider

CVD Diamond Specula Surface





Application

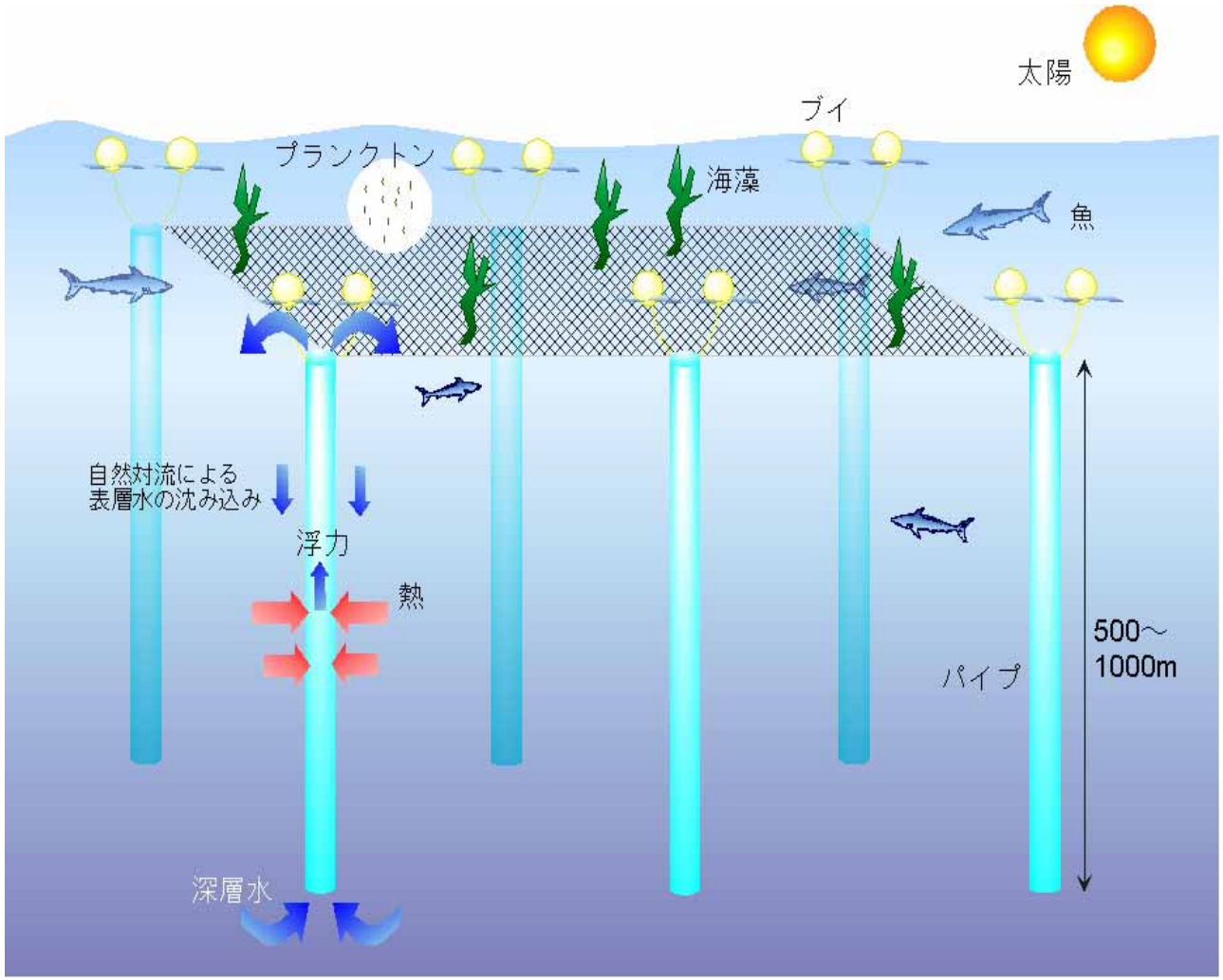
Linear Slider

Diamond and
Its ultra-smooth polishing

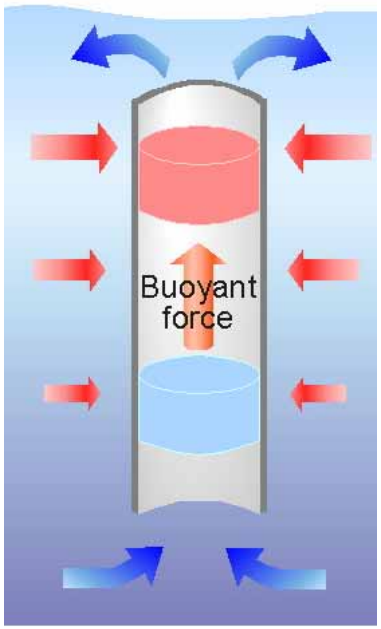
Prof.T. Takagi, et al., IFS, Tohoku Univ.

Out Line of Laputa Project

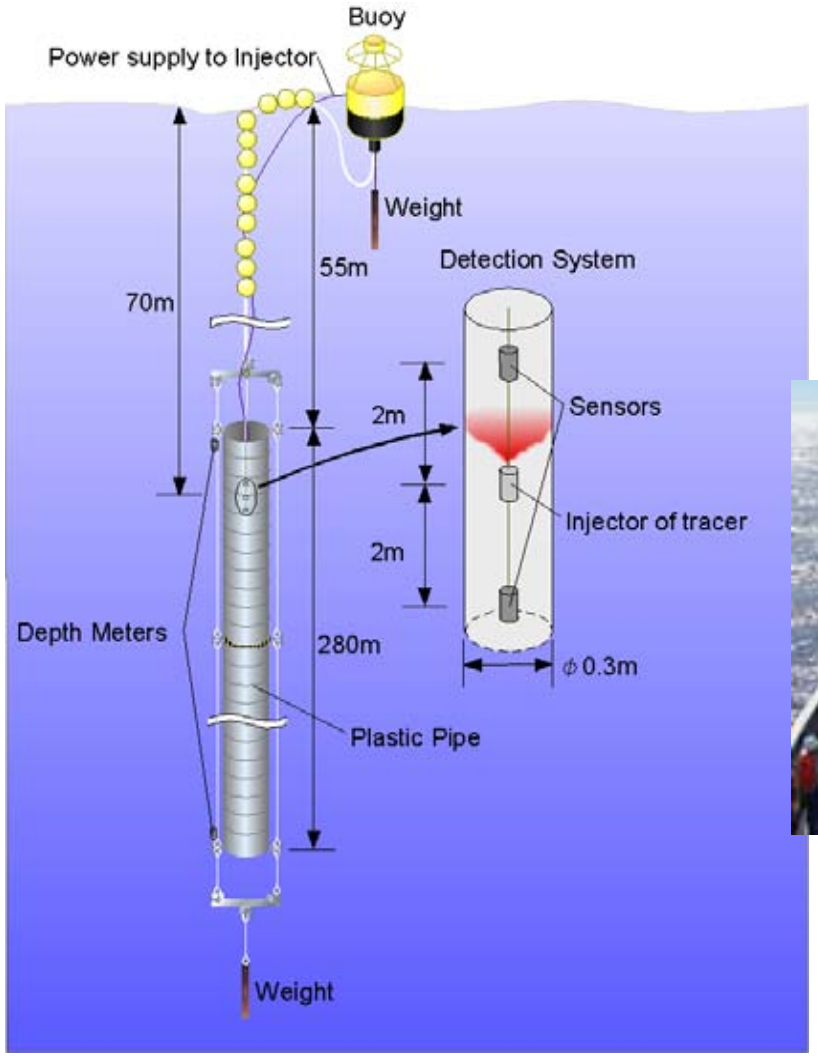
東北大学
流体科学研究所



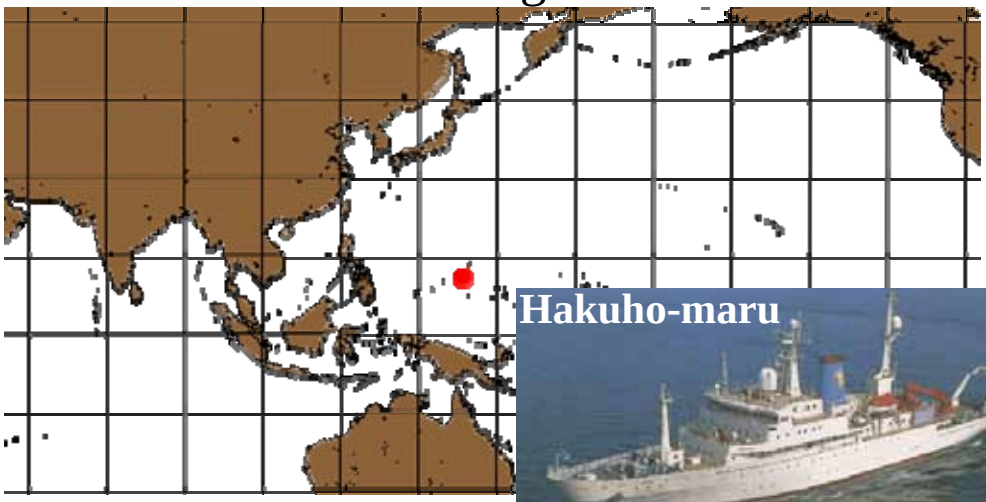
Stommel's Perpetual Salt Fountain (1956)



Experiment in Mariana Trench



KH02-2Cruise 2002 August 1st – 15th



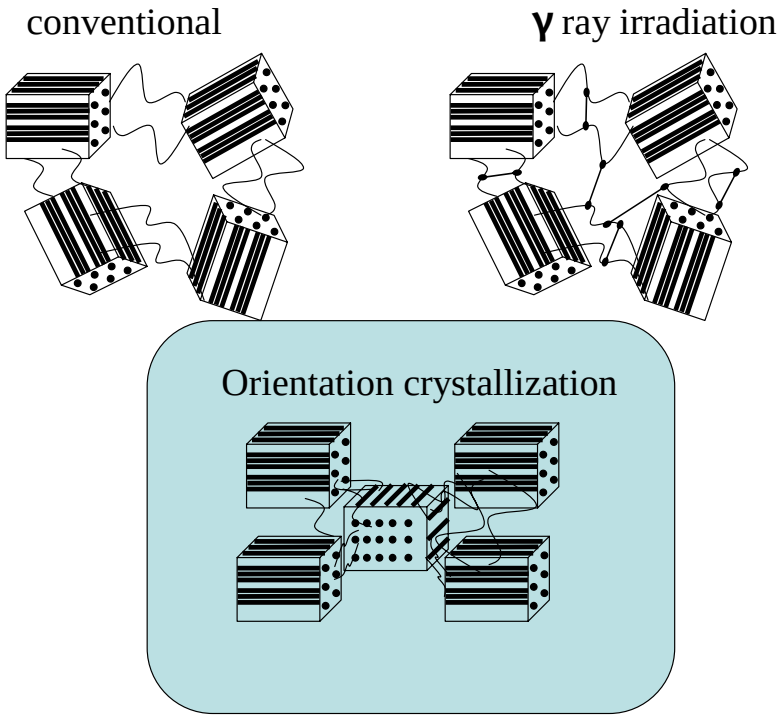
BIOMATERIALS
Bioceramics

Jerome Chevalier

INSA Lyon – GEMPPM

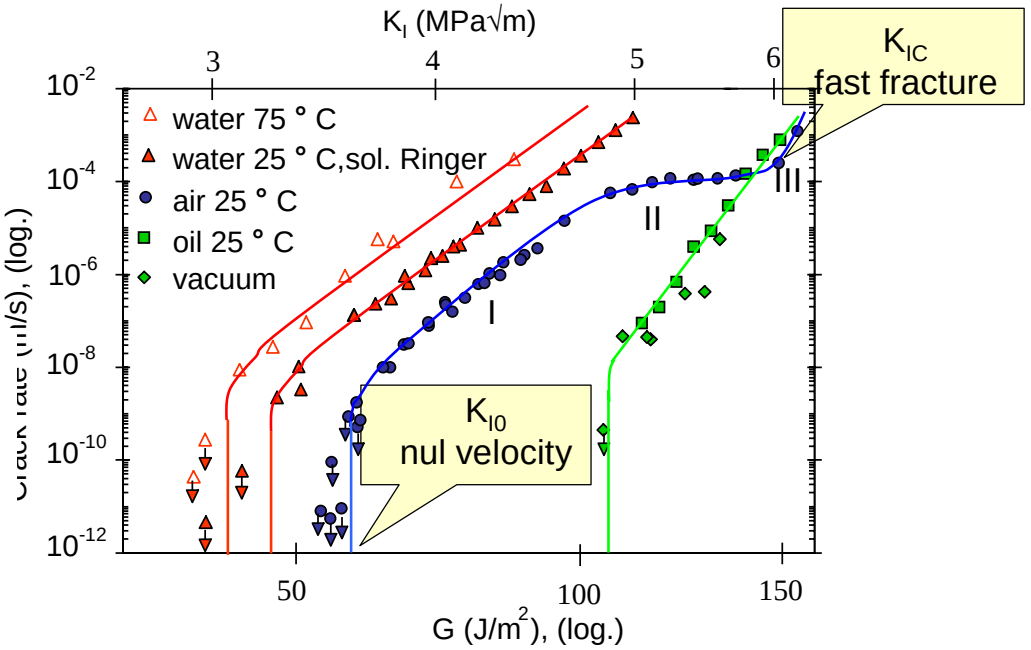
Physical Metallurgy and Materials Science Group

GEMPPM UMR CNRS 5510



Improvement of Materials with Mechanical properties

Example: Crack propagation in 3Y-TZP zirconia ceramic



Wear of UHMWPE

Makoto OHTA

Bio-Fluid Lab.,IFS, Tohoku Univ.

TUBERO
Tohoku University
Biomedical Engineering
Research Organization