Course of Mechanical Systems, Department of Mechanical and Aerospace Engineering, School of Engineering
Department of Mechanical Systems Engineering, Graduate School of Engineering
System Energy Maintenance Laboratory, Innovative Energy Research Center, Institute of Fluid Science

Miki Laboratory

Toward the advancement of maintenance technology to support the social infrastructure

FACULTY

Associate Professor
Hiroyuki MIKI

Concurrent Professor
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MISSION & FEATURE

Improving quality of life (QOL) of materials and machinery

In this laboratory, with the keyword “improving the quality of life (QOL) of materials and mechanical systems”, we are conducting research to improve the reliability and stability of the system by improving the functionality of each machine component. Aiming to improve the potential of the system and to realize an energy-saving and highly efficient mechanical system, in addition to the conventional “function and shape design”, the concept of “integration of functions”, higher reliability and durability We are engaged in research for the design of high-performance machines. The main research topics are as follows.

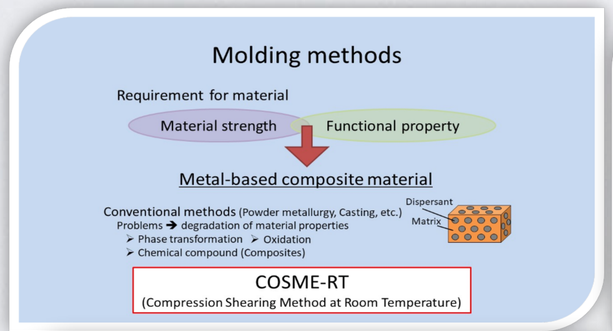
International Collaboration Research and Exchanges of Faculties and Students

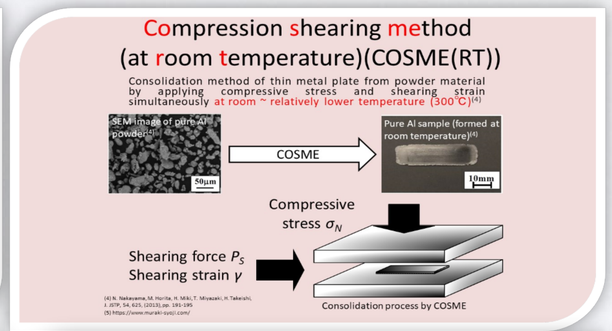
We have a lot of international collaboration projects with the research institutes in France, Germany, Russia, China, and so on. Students belonging to our lab have many chances to talk and discuss with foreign scientists. They can study and experience not only research but the difference in culture, lifestyle, view of social life of other countries. We hope that students be active at global issues.

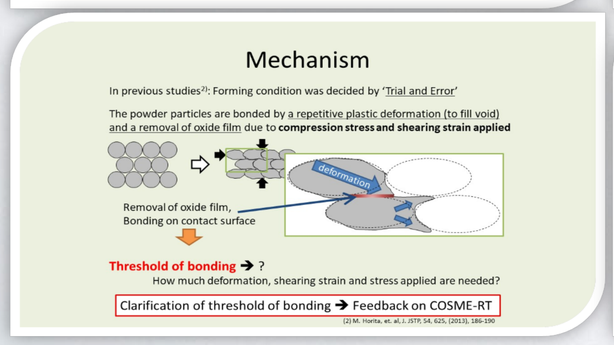
Concept in new material development

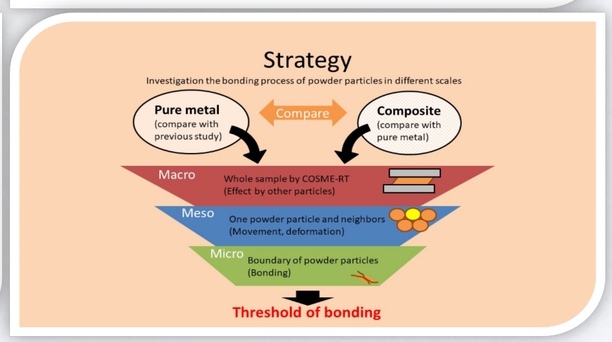
- To make materials in new ways
- To develop materials with new functions
- To propose a system using newly developed materials

➢ Development of dynamic crystallization technology of powder by “compressive force and shear force”



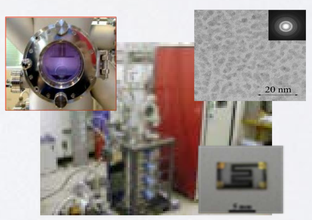




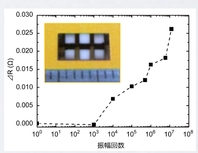


➢ Development of electromagnetic functional materials for “sensing and actuators”.

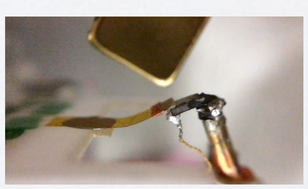
Thin film sensor composed of diamond-like carbon (DLC) is able to sense strain or fatigue at severe environment



PVD-PECVD hybrid deposition system



Evolution of resistance of DLC fatigue sensor according to repeated bending



Shape memory alloy for energy harvesting device

Multimaterial joint by compression shearing method at room temperature

Email: web-asel@wert.ifs.tohoku.ac.jp URL: http://www.ifs.tohoku.ac.jp/asel/index_en.html