



Newsletter

No. **8**E
March 1, 2006

The 21st Century COE Program
Mechanical Systems Innovation, The University of Tokyo

The 2nd International Symposium Series on Mechanical Systems Innovation is held

The International Symposium Series on Mechanical Systems Innovation was held for six full days at the end of 2005, from Friday, December 2 to Thursday, December 8, at the Takeda Conference Hall at the University of Tokyo. There were, in fact, three international symposia, centered on three different topics: Innovative Aerial/Space Flyer Systems, Biomedical Systems Innovation, and Distributed Energy Systems and Micro Grids. Each symposium lasted two days.

Professor Nobuhide Kasagi, the program leader, presided over the opening of these series and introduced the 21st Century COE Program, "Mechanical Systems Innovation." We invited famous researchers from home and abroad, and provided them multiple opportunities to exchange information about frontier research in their various fields. Poster sessions in each symposium invited presentations from numerous graduate students and young faculty members in the COE. In some parts of the symposia, a mini-oral presentation for the graduate students and young faculty members was planned, and their active participation attracted the attention of all in attendance.



Opening address by Prof. Kasagi,
the 21COE program leader.

The 2nd International Symposium on Innovative Aerial/Space Flyer Systems

"The 2nd International Symposium on Innovative Aerial/Space Flyer Systems," sponsored by the 21st Century COE program, "Mechanical Systems Innovation," was held on Friday and Saturday, December 2 and 3, 2005, at Takeda Conference Hall, the University of Tokyo. This symposium dealt with both (1) R&D on MAVs (micro air vehicles) and UAVs (unmanned air vehicles), and (2) R&D on space energy utilization. Both of these were organized by members of the Innovative Aerial Robot Project (IARP) and the Space Energy Research Group in the Energy Innovation Project (SERG) of our COE program, respectively.

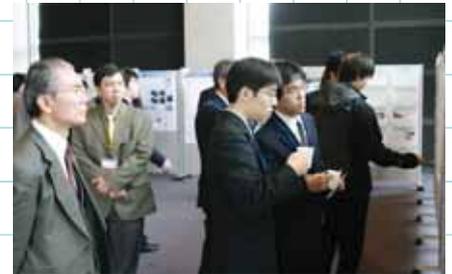


Group photo of participants of the symposium

The research results accomplished in the COE program were presented by our researchers, and up-to-date summary reports were made by the ten leading researchers from abroad, including Asia, the USA and Europe. Young graduate students and Ph.D. candidates made short oral presentations with posters. Demonstration experiments also stimulated discussions among our researchers and the invited speakers.

The 2nd International Symposium on Biomedical Systems Innovation

"The 2nd International Symposium on Biomedical Systems Innovation," sponsored by the 21st Century COE Program, "Mechanical Systems Innovation," was held on Monday and Tuesday, December 5 and 6, 2005 at Takeda Conference Hall. The symposium consisted of five sessions, namely, "Non-invasive Therapeutic Systems," "Medical Robotics," "Innovation in Medical Systems," "Imaging & Simulation" and "Nano-Bioengineering & Tissue Engineering." About 130 researchers from home and abroad gathered and had an information exchange. Seventeen researchers, leaders in various fields, delivered lectures. Prof. Michael R. Bailey (University of Washington), Prof. Wei Tech Ang (Nanyang Technological University), Dr. Jocelyne Troccaz (TIMC/IMAG Laboratory), Dr. Jeffrey A. Ketterling (Riverside Research Institute) and Prof. Shuichi Mizuno (Harvard Medical School) presented new information about medical therapy and biotechnology research.



Poster presentations by research assistants

In the poster session, which was held at lunch time, young researchers, who participate in this COE program, presented their work and had an active discussion with the invited researchers. At the close of the symposium, three posters were selected by a vote of the participants and given poster awards.

International Symposium on Distributed Energy Systems and Micro Grids

"The International Symposium on Distributed Energy Systems and Micro Grids," sponsored by the 21st Century COE program, "Mechanical Systems Innovation," and co-hosted by the Holonic Energy Systems Laboratory, was held on Wednesday and Thursday, December 7 and 8, 2005, at Takeda Conference Hall. The invited leading experts were in the areas of energy vision and energy systems, fuel cell and hybrid systems, biomass gas turbines, sodium sulfur batteries, energy storage and transportation, etc. Hot topics on the recent development of distributed energy systems were also introduced by Prof. Aristide Massardo (Universita di Genova, Italy), Prof. Jack Brouwer (University of California Irvine, USA), and Prof. Raffaele Tuccillo (University of Naples, Italy). Recent topics on micro grid technology were introduced by Johan Driesen (Katholieke Universiteit Leuven, Belgium) and Prof. Reza Iravani (University of Toronto, Canada). Poster sessions by young graduate students, post-docs and Ph.D. candidates, on energy systems and related topics were held and 26 posters were presented.



Answer by Prof. Brouwer to a question from audience

The discussions and interactions with invited speakers were intensive and exciting. The workshop was very successful in providing good opportunities to learn about the recent progress in each field by young researchers.

Power MEMS 2005 is held

The 5th International Workshop on Micro and Nanotechnology for Power Generation and Energy Conversion Applications (PowerMEMS 2005), sponsored by the 21st Century COE program, "Mechanical Systems Innovation," was held on November 28-30, 2005, at Takeda Hall on the Asano campus.

The workshop has been held at Tsukuba, Chiba and Kyoto for the past five years since 2000, when the first workshop was held in Sendai. It is the 5th International workshop, which specialized in the energy-related applications of micromachine technology and nanotechnology, and dealt with miniaturized fuel cells, micro heat engines, micro reactors and micro space promotions.

The invited lectures were "Pathways to Near-Perpetual Radioactive Micro Power Sources" given by Prof. A. Lal (Cornell University, USA), "The Experience Gained on the Ultra Microturbine: from Energetics to Component Bricks Studies" by Dr. Y. Ribaud (Onera, France), "Miniaturised Power and Propulsion for Small, Low Cost Space Exploration Missions: Current Status and a Look at the Future" by Dr. A. M. Baker (Surrey Satellite Technology Ltd, UK) and "Enzyme-Based Fuel Cells for Biomedical Microdevices" by Prof. M. Nishizawa, (Tohoku University, Japan).

Fifty-three high quality lectures and poster presentations were given, and more than 135 people from 14 countries as well as young Ph. D. candidates in the 21st Century COE program attended the workshop. It was very successful in providing good opportunities for the young researchers to discuss and interact with the invited speakers. The next workshop is scheduled to be held at the University of California at Berkeley beginning November 26, 2006.



Opening address by Prof. Kasagi,
the program leader



Atmosphere of the symposium



Answer by Dr. Baker
(Surrey Satellite Technology)



Presentation by Prof. Lal
(Cornell University)



Closing by Prof. Suzuki
(The University of Tokyo)

Program Executive Organization

Project Promoters

Program leader

Nobuhide Kasagi
Professor, Department of Mechanical Engineering, School of Engineering

Energy innovation

Masahiro Shoji
Professor Emeritus, Department of Mechanical Engineering, School of Engineering
Toshio Nagashima
Professor, Department of Aeronautics and Astronautics, School of Engineering
Chisachi Kato
Professor, Department of Human and Society, Institute of Industrial Science
Takayuki Terai
Professor, Department of Nuclear Engineering and Management, School of Engineering
Kazuo Kageyama
Professor, Department of Environmental and Ocean Engineering, School of Engineering
Nobuo Takeda
Professor, Department of Advanced Energy, School of Frontier Sciences
Tamaki Ura
Professor, Department of Environmental and Ocean Engineering, Institute of Industrial Science
Shinichi Nakasuka
Professor, Department of Aeronautics and Astronautics, School of Engineering
Toyohisa Fujita
Professor, Department of Geosystem Engineering, School of Engineering
Shigehiko Kaneko
Professor, Department of Mechanical Engineering, School of Engineering

Project members

Toshiki Iino Project Professor, International Research and Education Center for Mechanical Systems Innovation, School of Engineering
Yosuke Hasegawa Project Research Associate, International Research and Education Center for Mechanical Systems Innovation, School of Engineering

Advisory Committee

Advisory Committee

Koutaro Inoue Senior Fellow, Japan Science and Technology Agency
Noboru Kikuchi Professor, The University of Michigan

Biomedical innovation

Mamoru Mitsuishi
Professor, Department of Engineering Synthesis, School of Engineering
Masao Washizu
Professor, Department of Mechanical Engineering, School of Engineering
Masayuki Nakao
Professor, Department of Engineering Synthesis, School of Engineering
Teruo Fujii
Associate Professor, Department of Environmental and Ocean Engineering, Institute of Industrial Science
Takashi Ushida
Professor, Department of Mechanical Engineering, School of Engineering

Hyper modeling / simulation

Yoichiro Matsumoto
Professor, Department of Mechanical Engineering, School of Engineering
Takafumi Fujita
Professor, Department of Information and System, Institute of Industrial Science
Hideaki Miyata
Professor, Department of Environmental and Ocean Engineering, School of Engineering
Shinsuke Sakai
Professor, Department of Mechanical Engineering, School of Engineering
Shinobu Yoshimura
Professor, Department of Quantum Engineering and Systems Science, School of Engineering

Activities of Mechanical Systems Innovation Program

<International Symposia>

◎21COE Forum on Micro Scale Energy Conversion

Date : November 28, 2005
Venue : Takeda Hall, Takeda Building, Asano Campus

◎Power MEMS 2005

Date : November 28-30, 2005
Venue : Takeda Hall, Takeda Building, Asano Campus

◎The 2nd International Symposium on Innovative Aerial/Space Flyer Systems

Date : December 2, 3, 2005
Venue : Takeda Hall, Takeda Building, Asano Campus

◎The 2nd International Symposium on Biomedical Systems Innovation

Date : December 5, 6, 2005
Venue : Takeda Hall, Takeda Building, Asano Campus

◎International Symposium on Distributed Energy Systems and Micro Grids

Date : December 7, 8, 2005
Venue : Takeda Hall, Takeda Building, Asano Campus

<Domestic Symposium>

◎Toward Holonic Energy Systems

Date : July 11, 2005
Venue : Takeda Hall, Takeda Building, Asano Campus

<Open Seminars>

◎FY2005-10th Seminar

Date : September 5, 2005
Venue : Lecture Room No.226, Faculty of Engineering Bldg.8, Hongo Campus
Subject : Fluid Flow with Free Surfaces and Phase Change
Speaker : Dr. Gustav Amberg (Department of Mechanics, KTH)

◎FY2005-11th Seminar

Date : October 18, 2005
Venue : Lecture Room No.226, Faculty of Engineering Bldg.8, Hongo Campus
Subject : Nucleation and Growth of SWNTs Studied by QM/MD Simulations
Speaker : Dr. Stephan Irle (Cherry Emerson Center for Scientific Computation, Emory University)

◎FY2005-12th Seminar

Date : October 26, 2005
Venue : Lecture Room No.226, Faculty of Engineering Bldg.8, Hongo Campus
Subject : Novel Floating Catalyst and Surface CVD Synthesis of Carbon Nanotubes
Speaker : Prof. Esko I. Kauppinen (Department of Physics & Centre for New Materials, Helsinki University of Technology)

◎FY2005-13th Seminar

Date : November 9, 2005
Venue : Lecture Room No.226, Faculty of Engineering Bldg.8, Hongo Campus
Subject : Thermal Conductance of Solid-Solid and Solid-Liquid Interfaces
Speaker : Prof. David G. Cahill (Department of Materials Science, University of Illinois)

The 21st Century COE Program Mechanical Systems Innovation, Newsletter No.8E

March 1, 2006
The 21st Century COE Program Mechanical Systems Innovation Office, The University of Tokyo
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8656, JAPAN
Phone and Fax/+81 3 5841 7437
URL/ <http://www.mechasys.jp>