

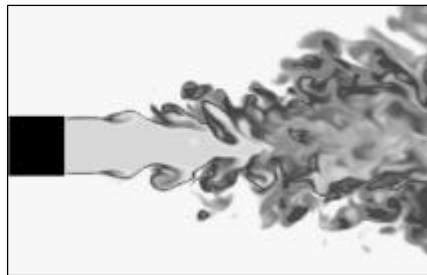
# Symposium on Smart Control of Turbulence

Place

Faculty of Engineering Bldg. No.11  
The University of Tokyo, Tokyo, Japan

Date

December 2-3, 1999



Sponsored by

National Aerospace Laboratory  
Mechanical Engineering Laboratory  
Ship Research Institute

Supported by

Science and Technology Agency  
Graduate School of Engineering, The University of Tokyo

in cooperation with

The Japan Society of Mechanical Engineers  
The Japan Society for Aeronautics and Space Sciences  
The Society of Naval Architects of Japan  
Turbulence Engineering Laboratory, The University of Tokyo

World Wide Web :

<http://www.srimot.go.jp/turbulence/english/symposium.html>

## **Background and Topics of the Symposium**

At present, three national research institutes are carrying out a study on Smart Control of Turbulence ( Study for Open and Integrated Research Program by the Science and Technology Agency for FY 1999, Executive Manager: Prof. Hideo Ohashi, President, Kogakuin University). The purpose of this study is to demonstrate the possibility of smart turbulence control, which should lead to tremendous technological impacts such as drag reduction and enhancement in combustion and heat transfer, by developing highly intelligent fluid-dynamic devices with new functions. This interdisciplinary research target can be fulfilled by the unique collaboration between three national laboratories, namely, NAL (National Aerospace Laboratory, Science and Technology Agency), MEL (Mechanical Engineering Laboratory, Agency of Industrial Science and Technology, MITI), and SRI (Ship Research Institute, Ministry of Transport). Leading scientists at several top universities will also join and help with this project.

In this symposium, invited speakers will give overviews on the recent study of smart control of turbulence and the speakers of each research institute will present the following research targets: (1) conceptual design of micro devices for active feedback control of turbulence, (2) in-depth study on the role of turbulence in combustion and its possible control, (3) in-depth study on the turbulence modification mechanisms with mechano-chemical functionalization of fluids (surfactants, micro bubbles, ... etc.), and (4) large-scale numerical simulation of shear flow turbulence, turbulence combustion, and turbulence control mechanisms.

## **Organizing Committee**

Prof. Nobuhide Kasagi (Chair, The University of Tokyo)  
Dr. Yoshiaki Kodama (SRI)  
Dr. Yasutaka Tsutsui (MEL)  
Dr. Hiro Yoshida (MEL)  
Dr. Satoru Ogawa (NAL)  
Mr. Kazuyoshi Harumi (SRI)  
Mr. Hideyuki Shirota (SRI)  
Dr. Yasuhiro Mizobuchi (NAL)

## **Advisory Committee**

Prof. Yoichiro Matsumoto (Chair, The University of Tokyo)  
Prof. Koichi Hayashi (Aoyamagakuin University)  
Prof. Koichi Hishida (Keio University)  
Prof. Toshio Miyauchi (Tokyo Institute of Technology)  
Prof. Akira Yoshida (Tokyo Denki University)  
Dr. Shuhei Onishi (NEC)  
Dr. Kenkichi Tamura (JAMSTEC)

## Time Table

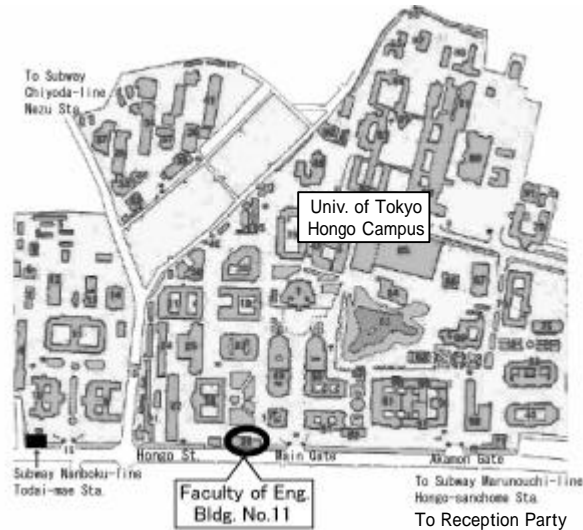
### December 2 (Thu)

- 09:30 - 09:40 **Opening Address**  
H. Ohashi, Kogakuin Univ., Japan
- 09:40 - 09:45 **Welcome Address**  
N. Nakajima, Univ. of Tokyo, Japan
- 09:45 - 10:45 **Overview of Turbulence Control Research in U.S.A.**  
M. Gad-el-Hak, Univ. of Notre Dame, USA
- [Break]**
- 11:00 - 12:00 **European Drag Reduction Research – Recent Developments and Current Status**  
K.S. Choi, Univ. of Nottingham, UK
- [Lunch]**
- 13:30 - 14:30 **Shear Flow Control using Fluidic Actuator Technology**  
A. Glezer, Georgia Institute of Technology, USA
- 14:30 - 15:30 **Controlling Emissions, Intensity, and Stability of Turbulent Premixed Combustion**  
Robert K. Cheng,  
Lawrence Berkley National Laboratory, USA
- [Break]**
- 16:00 - 17:00 **Skin Friction Reduction by Microbubbles**  
H. Kato, Toyo Univ., Japan
- 17:30 - 19:30 **Reception Party**  
Room “*Nishiki*”, Tokyo Garden Palace Hotel

### December 3 (Fri)

- 09:30 - 10:00 **Outline of Turbulence Control Project**  
N. Kasagi, Univ. of Tokyo, Japan
- 10:00 - 10:45 **Turbulence Control by Active Devices**  
H. Yoshida, MEL, Japan
- [Break]**
- 11:00 - 11:45 **Toward Smart Control of Turbulent Combustion Flow**  
S. Ogawa, NAL, Japan
- 11:45 - 12:30 **Turbulence Control by Functionalization of Fluids**  
Y. Kodama, SRI, Japan
- 12:30 - 12:35 **Closing Speech**  
N. Kasagi, Univ. of Tokyo, Japan

## [Symposium Site]

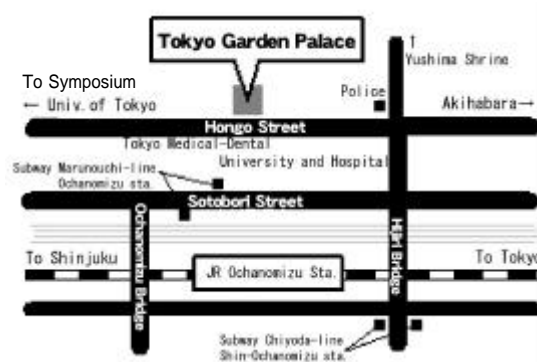


## [Reception Party]

Date : December 2, 17:30-19:30

Place : Room "Nishiki", Tokyo Garden Palace Hotel  
1-7-5 Yushima, Bunkyo-ku, 113-0034 Tokyo  
Tel: +81-3-3813-6211

Fee : ¥ 3,000 (student : ¥ 1,000)



## Secretariat of Symposium on Smart Control of Turbulence

Ship Research Institute, Ministry of Transport  
6-38-1 Shinkawa, Mitaka, Tokyo 181-0004, Japan

Kazuyoshi Harumi  
Fax: +81-422-41-3101  
E-mail: hal@srilot.go.jp