

Background and Topics of the Symposium

At present, three national research institutes are carrying out a study on Smart Control of Turbulence ("Smart Control of Turbulence: A Millennium Challenge for Innovative Thermal and Fluids Systems", Project for Organized Research Combination System by the Ministry of Education, Culture, Sports, Science and Technology, Executive Manager: Hideo Ohashi, President, Kogakuin University, Steering Committee Chair: Nobuhide Kasagi, Professor, The University of Tokyo). The purpose of this study is to realize the 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 of Japan), AIST (National Institute of Advanced Industrial Science and Technology), and NMRI (National Maritime Research Institute). 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 the each research institutes will present following research targets: (1) conceptual design of micro devices for active feedback control of turbulence, (2) study on control of turbulent combustion, (3) turbulence control 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

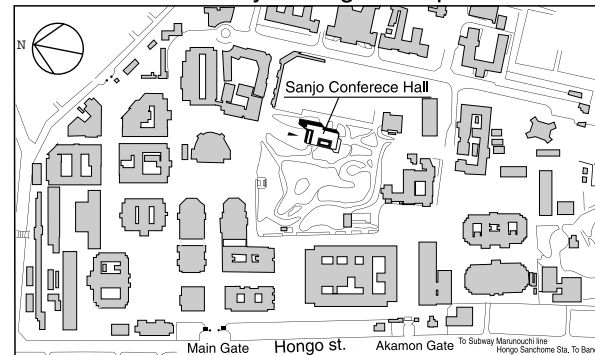
Prof. Nobuhide Kasagi (Chair, The University of Tokyo)
Dr. Satoru Ogawa (NAL)
Dr. Kazuo Suzuki (NAL)
Dr. Hiro Yoshida (AIST)
Dr. Yasuo Kawaguchi (AIST)
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Prof. Koichi Hishida (Keio University)
Prof. Toshio Miyauchi (Tokyo Institute of Technology)
Prof. Akira Yoshida (Tokyo Denki University)
Dr. Shuhei Onishi (NEC)

[Symposium Site]

Univ. of Tokyo Hongo Campus

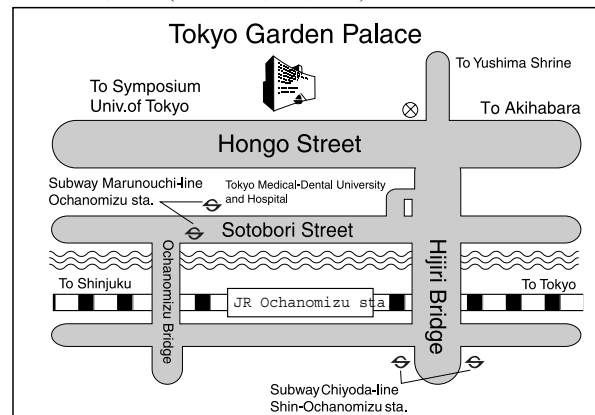


[Banquet]

Date: March 4th 18:30 - 20:30

Place: Tokyo Garden Palace Hotel, room "Nishiki"

Fee: ¥5,000 (Student, ¥2,000)



Secretariat of

3rd Symposium on Smart Control of Turbulence

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3rd Symposium on Smart Control of Turbulence

Sanjo Conference Hall
The University of Tokyo
Tokyo, Japan

March 3-5, 2002

Sponsors

National Aerospace Laboratory of Japan (NAL)
National Institute of Advanced Industrial Science
and Technology (AIST)
National Maritime Research Institute (NMRI)

Supporting Organization

Ministry of Education, Culture, Sports,
Science and Technology
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The Japan Society of Mechanical Engineers (JSME)
The Japan Society for Aeronautics and
Space Sciences (JSASS)
The Society of Naval Architects of Japan (SNAJ)

Center for Smart Control of Turbulence

http://www.turbulence-control.gr.jp/sympo_e/FY2001/

Time Table

<u>March 3 (Sun)</u>			[Break]			<u>13:20-14:50 Technical Session 5</u>		
17:30-19:30 Registration & Reception Party						(Turbulence Control by Using of Functionality of Fluid Properties)		
<u>March 4 (Mon)</u>			<u>15:30-17:20 Technical Session 3</u>			13:20-13:50 Controlling the Size of Microbubbles for Drag Reduction		
09:30-09:50 Opening and Welcome Address			(Control of Turbulent Combustion)			*T. Kawamura, Univ. of Tokyo, A. Kakugawa, Y. Kodama, NMRI, Y. Moriguchi, H. Kato, Toyo Univ.		
H. Komiyama, Dean, Graduate School of Engineering, Univ. of Tokyo,			15:30-16:20 Progress in Description of Turbulent Combustion			13:50-14:20 Numerical Simulations on Drag Reduction Mechanism by Microbubbles		
H. Ohashi (Executive Manager of the Project), President, Kogakuin Univ.			F. A. Williams (Invited Talk), UCSD			K. Sugiyama, NMRI, T. Kawamura, *S. Takagi, Y. Matsumoto, Univ. of Tokyo		
09:50-10:00 Overview of Turbulence Control Project			16:20-16:50 Measurement of Combustion Fluctuations in Turbulent Premixed Methane/Air Burner and High Pressure Oil Burner			14:20-14:50 DNS Study on the Drag Reducing Flow with Additives Employing Giesekus Fluid Model and MINMOD Scheme		
N. Kasagi, Univ. of Tokyo			*Y. Ikeda, Kobe Univ., L. Zimmer, NAL			-Effect of Weissenberg Number on the Turbulent Flow Structure -		
10:10-12:00 Technical Session 1			16:50-17:20 Numerical Analysis on Stabilization of a Lifted Flame			B. Yu, AIST, Center for Smart Control of Turbulence, *Y. Kawaguchi, AIST, S. Takagi, Y. Matsumoto, Univ. of Tokyo		
(Active Control of Turbulence)			*Y. Mizobuchi , J. Shinjo, S. Tachibana, NAL			[Break]		
10:10-11:00 Skin Friction and Pressure: the “Footprints” of Turbulence			<u>18:30-20:30 Banquet at Tokyo Garden Palace Hotel</u>			<u>15:00-16:30 Technical Session 6</u>		
*T. R. Bewley (Invited Talk), B. Protas, UCSD						(Control of Turbulent Combustion)		
11:00-11:30 Toward Smart Control of Separation around a Wing			<u>March 5 (Tue)</u>			15:00-15:30 On the Sound Generation and its Controls in Turbulent Combustion Field		
S. Takagi, N. Tokugawa, A. Nishizawa, NAL, H. Abe, Y. Kikushima, R. Maeda, *H. Yoshida, AIST			09:30-12:00 Technical Session 4			*M. Tanahashi, S. Tsukinari, T. Saitoh, T. Miyauchi, Tokyo Inst. of Tech., G Choi, NAL, M. Ikame, T. Kishi, K. Harumi, K.Hiraoka, NMRI		
11:30-12:00 Management of a Longitudinal Vortex for Separation Control			(Active Control of Turbulence)			15:30-16:00 Study on Active Control of Combustion Oscillations for Lean Premixed Combustion Systems		
*H. Abe, T. Segawa, T. Matsunuma, H. Yoshida, AIST			09:30-10:20 Sensors, Actuators and Algorithms for Practical Implementations of Turbulence Boundary Layer Control			*A. K. Hayashi, Y. Yamazaki, Aoyama Gakuin Univ., S. Ogawa, T. Yamamoto, NAL, T. Mizuno, Saitama Univ., S. Kagiya, T. Motegi, Tokyo Gas Company Ltd.		
[Lunch]			K. Breuer (Invited Talk), Brown University			16:00-16:30 Combustion Instability in a Swirl Type Combustor		
<u>13:20-15:10 Technical Session 2</u>			[Break]			*T. Yamamoto, Y. Kurosawa, NAL, S. Yoshida, NEDO, K. Shimodaira, S. Tachibana, M.Gomi, K.Suzuki, NAL, A. K. Hayashi, Aoyama Gakuin Univ.		
(Turbulence Control by Using of Functionality of Fluid Property)			10:30-11:00 Active Feedback Control of Turbulent Pipe Flow			<u>16:30-16:40 Closing Sessions and Future Plans</u>		
13:20-14:10 The University of Michigan HIPLATE Experiment			*K. Fukagata, AIST, Univ. of Tokyo, N. Kasagi, Univ. of Tokyo			Y. Kodama, NMRI		
W. Sanders, D. R. Dowling, M. Perlin, *S. L. Ceccio (Invited Talk), Univ. of Michigan			11:00-11:30 Genetic Algorithm-Based Optimization of Feedback Control Scheme for Wall Turbulence					
14:10-14:40 PIV/LIF Measurement of Wall Turbulence Modification by Microbubbles			*K. Morimoto, K. Iwamoto, Y. Suzuki, N. Kasagi, Univ. of Tokyo					
*S. Nagaya, NMRI, K. Hishida, Keio Univ., A. Kakugawa, Y. Kodama, NMRI			11:30-12:00 Toward Development of Feedback Control System for Wall Turbulence with MEMS Sensors and Actuators					
14:40-15:10 The Turbulence Structure in Bubbly Channel Flow			*T. Yoshino, M. Tsuda, Y. Suzuki, N. Kasagi, Univ. of Tokyo					
*A. Fujiwara, Keio Univ., S. So, S. Takagi, Univ. of Tokyo, K. Hishida, Keio Univ. , Y. Matsumoto, Univ. of Tokyo			[Lunch]					