

Preliminarily distributed documents

Asian Congress on Gas Turbines 2009

ACGT2009

Tokyo, Japan
August 24-26, 2009

Organized by

Gas Turbine Society of Japan

Korean Fluid Machinery Association

Institute of Engineering Thermophysics/Chinese Academy of Sciences



Asian Congress on Gas Turbines 2009

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Organization of Asian Congress on Gas Turbines 2009

■ Organizing Society

Gas Turbine Society of Japan (GTSJ)

Korean Fluid Machinery Association (KFMA)

Institute of Engineering Thermophysics / Chinese Academy of Sciences (CAS)

■ Organizing Committee

Osamu Kawaguchi (Keio University, Japan)

Toshinori Watanabe (University of Tokyo, Japan), Chairperson

Makoto Yamamoto (Tokyo University of Science, Japan)

Won-Gu Joo (Yonsei University, Korea)

Daesung Lee (Korea Aerospace Research Institute, Korea)

Seung Jin Song (Seoul National University, Korea)

Jingyi Chen (Institute of Engineering Thermophysics / Chinese Academy of Sciences, China)

Xiaofeng Sun (Beijing University of Aeronautics and Astronautics, China)

Weiguang Huang (Institute of Engineering Thermophysics / Chinese Academy of Sciences, China)

■ Local Organizing Committee

Takehiro Himeno (Univ. of Tokyo)

Yoshiya Nakamura (INC)

Chisachi Kato (Univ. of Tokyo)

Tomoya Murota (Hitachi)

Yoshiyuki Fujitsuna (ESPR)

Masafumi Fukuda (NIMS)

Katsuhiko Ishida (KHI)

Toyoaki Komori (MHI)

Hisashi Matsuda (Toshiba)

Kenichi Funazaki (Iwate Univ.)

Yutaka Ohta (Waseda Univ.)

Takashi Yamane (JAXA)

Hisao Futamura (JAXA)

Yasuhiro Kinoshita (KHI)

Kenichiro Takeishi (Osaka Univ.)

Naoki Tsuchiya (IHI)

MESSAGE FROM THE ORGANIZING COMMITTEE

On behalf of the Organizing Committee, I would like to welcome all of you to the Asian Congress on Gas Turbines (ACGT) 2009 in Tokyo. The ACGT is a new international congress on gas turbines which was initiated in 2005 through the collaboration of the Gas Turbine Society of Japan and the Korean Fluid Machinery Association (KFMA) aiming at the promotion of gas turbine technology and research in Asia. The ACGT 2009 is the second congress in which the Institute of Engineering Thermophysics / Chinese Academy of Sciences (CAS) joins as a new collaborating society.



The program of ACGT 2009 includes an invited Keynote Lecture, three Keynote Speeches, and two Forum Sessions. The Keynote Lecture addresses a timely issue of the gas turbine world, and the Keynote Speeches present the latest R & D topics as well as scientific issues for future gas turbine technology. We are honored to have Professor Dillip R. Ballal as the lecturer, and Professor Jeong Lak Sohn, Professor Feng Lin, and Mr. Yasuyuki Watanabe as the speakers. The Forum Sessions are pre-organized sessions of several technical presentations and free discussions. A total of 70 papers are to be presented in the general sessions, and the exhibition of gas turbine related technologies is also organized at the congress site.

The Asian gas turbine markets are rapidly growing and the technology is accordingly progressing now. The activity of ACGT is expected to promote the communication and cooperation among Asian gas turbine societies, and lead the organization of stronger community in the world.

The congress is made possible based on the contribution and dedication of many individuals and organizations. I extend my sincere gratitude to the collaborating societies, the members of the Organizing Committee and Local Organizing Committee, who contributed so much effort to make the ACGT2009 a great success. The authors, session chairs, exhibitors, GTSJ staff, all did tremendous work, and I greatly appreciate their efforts. Finally, I thank you all for coming to ACGT2009, and wish you will enjoy the Congress.

Toshinori Watanabe

Toshinori Watanabe

Chairman

Organizing Committee of the ACGT2009

Asian Congress on Gas Turbines 2009

■ Term of Session

August 24(Mon.)-August 26(Wed.)

■ Congress Venue

Institute of Industrial Science, University of Tokyo
4-6-1 Komaba Meguro-ku, Tokyo, Japan

■ Objectives

ACGT 2009 aims to provide an international forum for exchange of information related to gas turbine technology, especially among researchers in Asian Region. Through the enhancement of interaction and cooperation among Asian researchers and students, the ACGT2009 is expected to promote pan-Asian cooperative effort in gas turbine research and development.

■ Keynote Lecture

“Alternative Fuels and Energy Strategies for Gas Turbines”

Prof. Dilip R. Ballal (ASME Vice President for IGTI, University of Dayton)

■ Keynote Speech

“Fuel Cell-Gas Turbine Hybrids”

Prof. Jeong Lak Sohn (Seoul National University, Korea)

“Aero-Engine Business in IHI and Challenges to the Future”

Yasuyuki Watanabe (IHI Corporation, Japan)

“Unsteady Tip Leakage Flow and Perspectives to Stall Mechanism in Axial Compressors”

Prof. Feng Lin (Institute of Engineering Thermophysics, Chinese Academy of Sciences, China)

■ Forum

Topics will deal with strategic issues related to gas turbines which are emerging in Asia

Forum 1 “Current Energy Situation in Asia”

Forum 2 “CO2 Reduction and Environmental Issues in Asia”

■ Topics of Technical session

- Aerodynamics · Combustion · Development and Testing of Gas Turbine Systems
- Diagnostics, Control and Measurement · Environmental Issues · Heat Transfer · Materials
- Maintenance · Performance Analysis and Advanced Cycles · Reliability · Turbomachinery
- Operational Experience of Gas Turbines · Rotordynamics · Structures & Dynamics

■ Exhibition

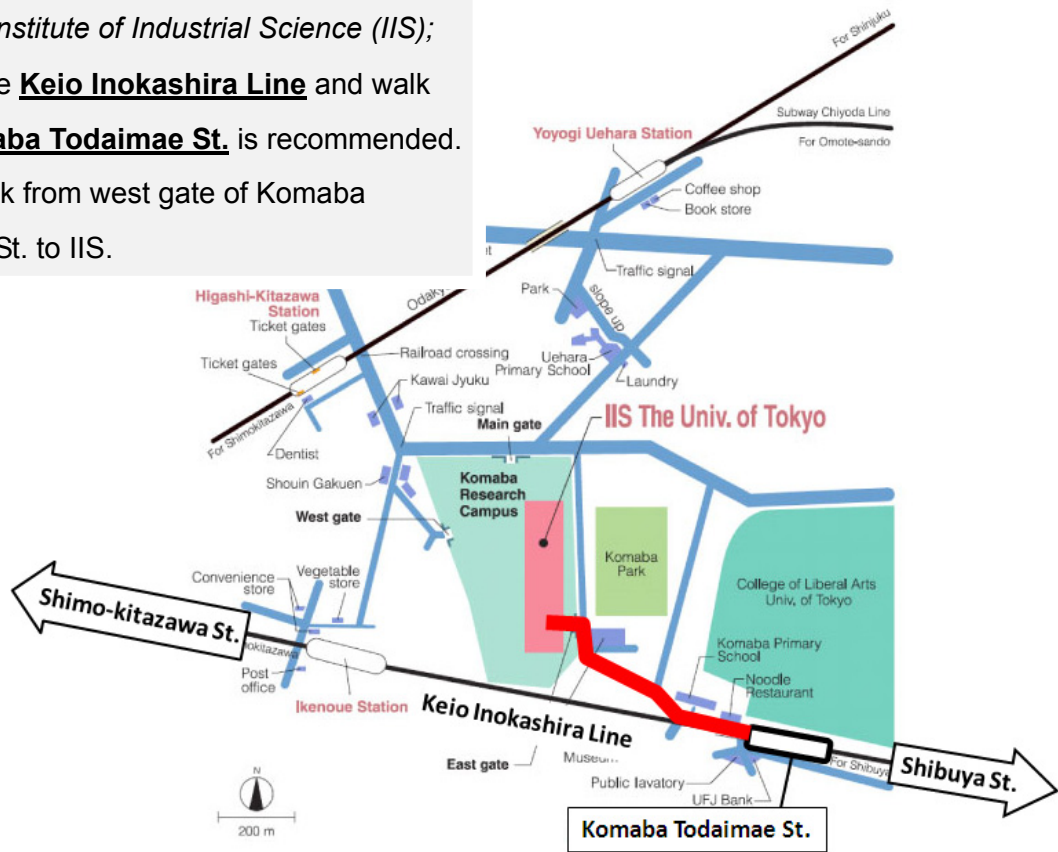
The Exhibition will be held in conjunction with the technical sessions in the foyer of the Convention Hall.

Location and Floor Plan of the Congress Venue

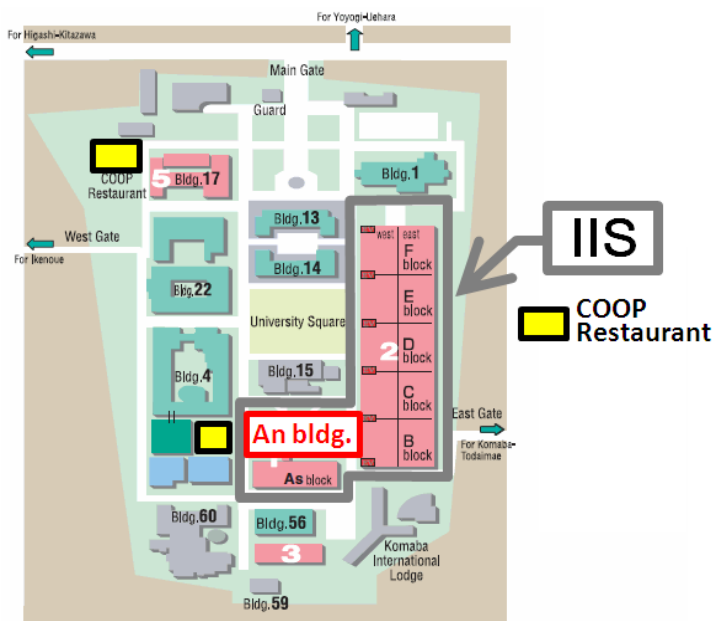
Map to Institute of Industrial Science, Univ. of Tokyo

Direction to Institute of Industrial Science (IIS);

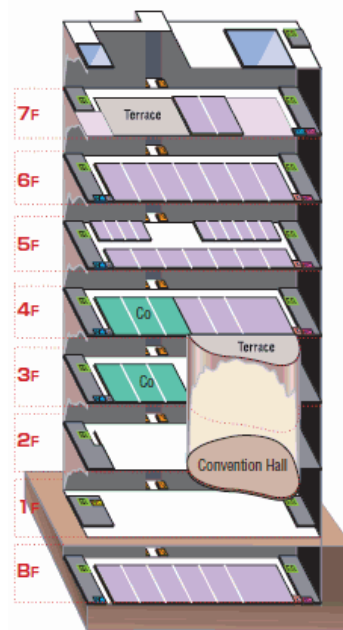
- To take the **Keio Inokashira Line** and walk from **Komaba Todaimae St.** is recommended.
- 10min walk from west gate of Komaba Todaimae St. to IIS.



Map in Komaba Research Campus

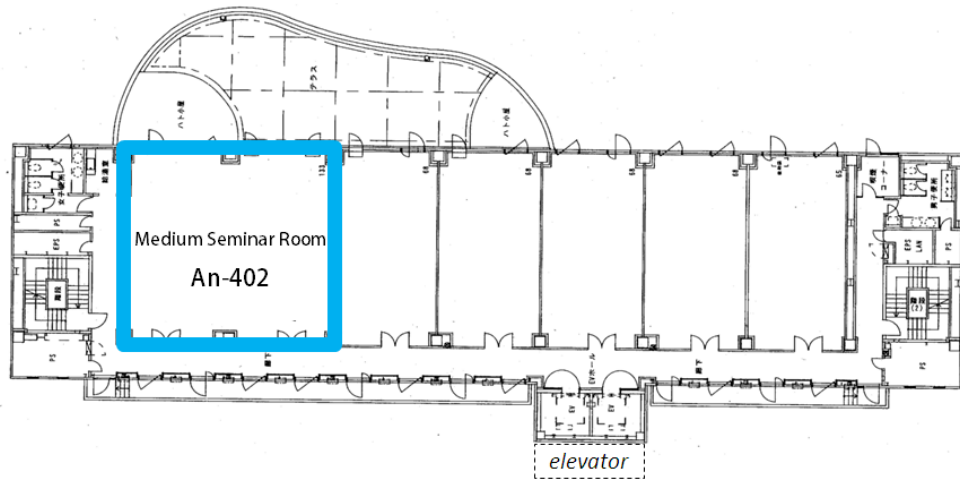


Floor Map inside "An Bldg."

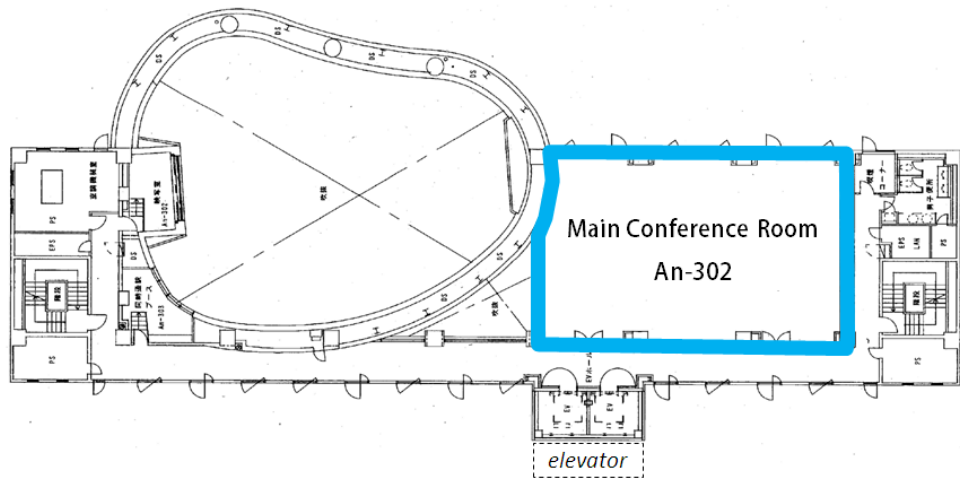


■ Congress Room in "An bldg."

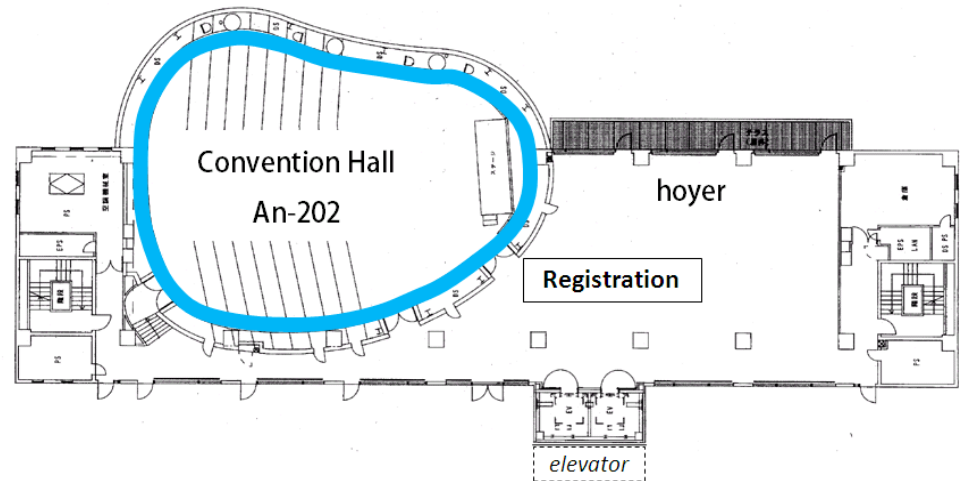
4F



3F

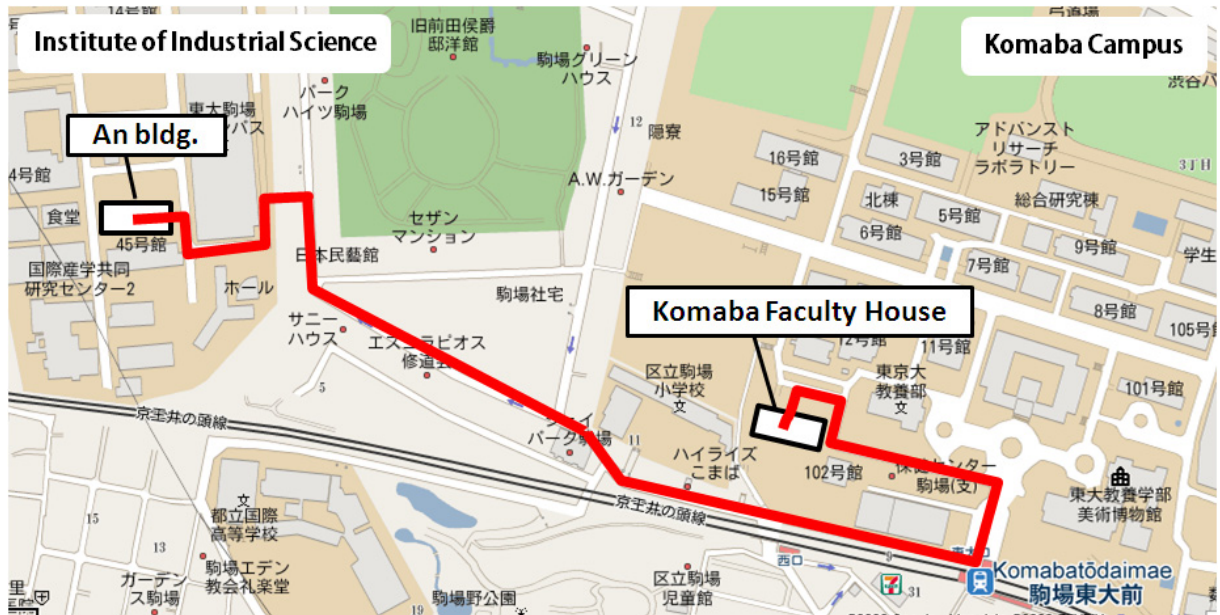


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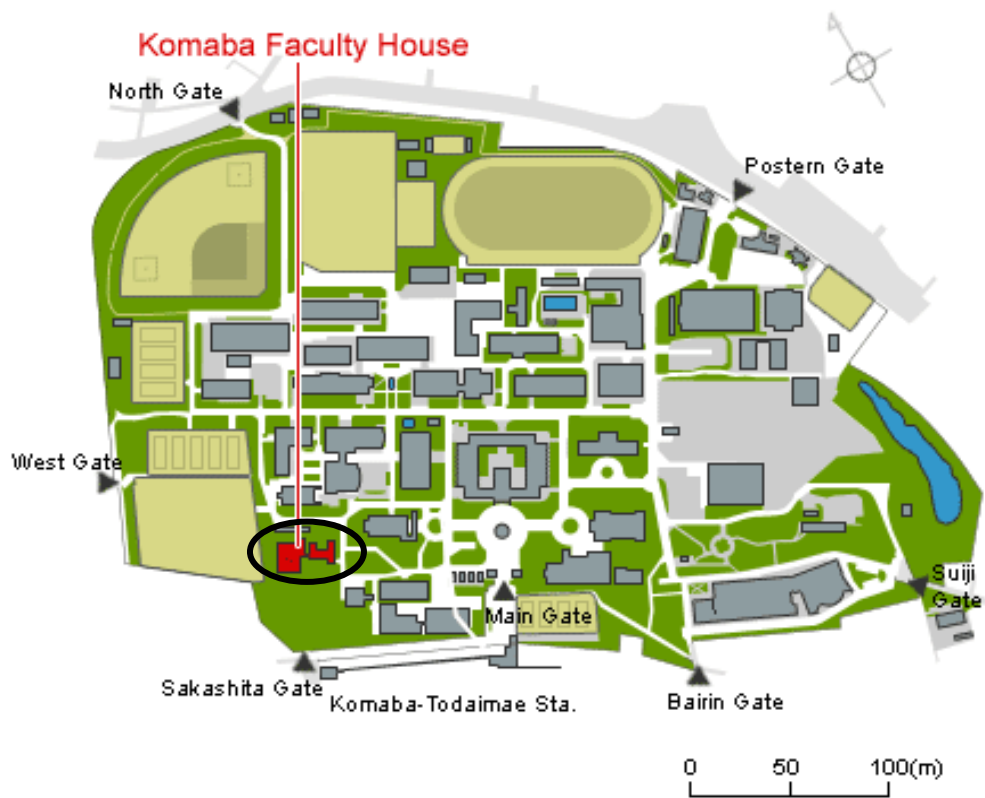
Banquet Venue – Komaba Faculty House, Univ. of Tokyo

■ Direction Map from Institute of Industrial Science to Komaba Campus



10min walk from IIS to Komaba Campus

■ Komaba Campus, Univ. of Tokyo



Schedule at a Glance

■ August 24, Monday

08:40 - 18:00	Registration	
09:15 - 09:30	Opening Address	(Convention Hall)
09:30 - 10:20	Keynote Speech 1	(Convention Hall)
10:20 - 10:35	Coffee Break	
10:35 - 12:15	Technical Sessions	(3 rooms)
12:15 - 13:30	Lunch Break	
13:30 - 15:10	Forum 1	(Convention Hall)
15:10 - 15:30	Coffee Break	
15:30 - 17:35	Technical Sessions	(3 rooms)

■ August 25, Tuesday

09:10 - 18:00	Registration	
09:30 - 10:20	Keynote Speech 2	(Convention Hall)
10:20 - 10:35	Coffee Break	
10:35 - 12:15	Technical Sessions	(3 rooms)
12:15 - 13:30	Lunch Break	
13:30 - 15:10	Technical Sessions	(3 rooms)
15:10 - 15:30	Coffee Break	
15:30 - 16:45	Technical Sessions	(3 rooms)
16:45 - 17:00	Coffee Break	
17:00 - 17:50	Keynote Lecture	(Convention Hall)
17:50 - 18:10	Awards Ceremony	(Convention Hall)
18:40 - 20:30	Banquet	(Faculty House in Komaba Campus)

■ August 26, Wednesday

09:10 - 12:00	Registration	
09:30 - 10:20	Keynote Speech 3	(Convention Hall)
10:20 - 10:35	Coffee Break	
10:35 - 12:15	Technical Sessions	(3 rooms)
12:15 - 13:30	Lunch Break	
13:30 - 15:10	Technical Sessions	(2 rooms)
15:10 - 15:30	Coffee Break	
15:30 - 17:10	Forum 2	(Convention Hall)
17:10 - 17:20	Closing Address	

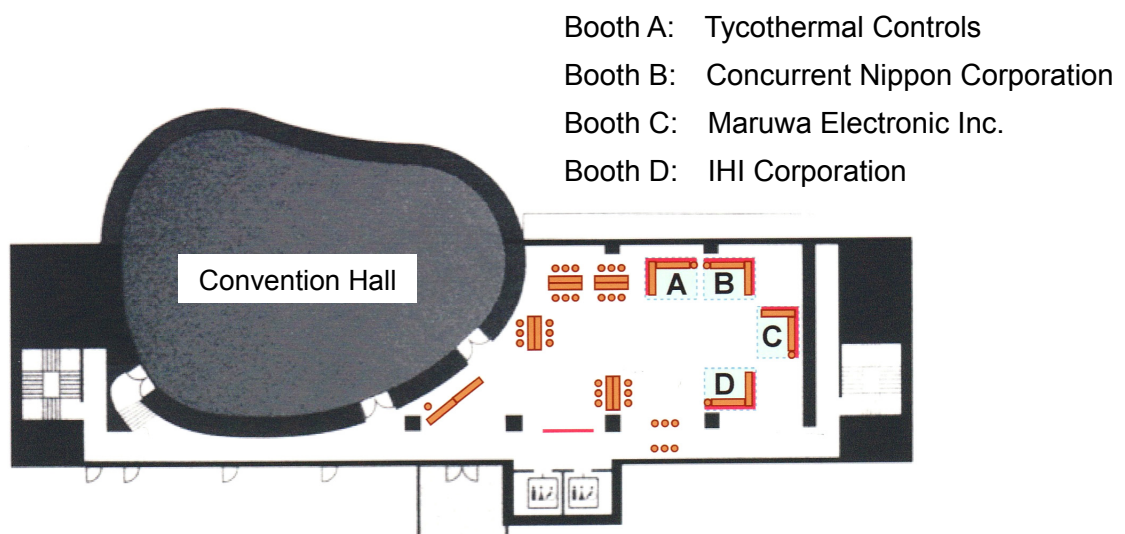
	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402	
Aug. 24 (Mon)	9:15	Opening Address		
	9:30	Keynote Speech 1		
	10:20	Break		
	10:35	Noise and Unsteady Phenomena	Turbine Aerodynamics and Performance	Advanced Gas Turbine System 1
	12:15	Lunch		
	13:30	Forum 1		
	15:10	Break		
	15:30	Tip Leakage and 3D Flow in Turbomachinery	Internal Cooling	Advanced Gas Turbine System 2
	17:35	Closing		
	Aug. 25 (Tue)	9:30	Keynote Speech 2	
10:20		Break		
10:35		Aerodynamic Components	Heat Exchanger and Geometry Effect	Combustion Analysis
12:15		Lunch		
13:30		CFD Analysis and Optimization	Numerical Analysis of Heat Transfer Characteristics	Combustor Development
15:10		Break		
15:30		Structures and Manufacturing	Film Cooling	Flameless Combustion
16:45		Break		
17:00		Keynote Lecture		
17:50		Awards Ceremony		
18:10	Closing			
18:40	Banquet at Faculty House in Komaba Campus, University of Tokyo			
Aug. 26 (Wed)	9:30	Keynote Speech 3		
	10:20	Break		
	10:35	Stall and 3D Instability	Monitoring and Control	Combustion Instability and Numerical Analysis
	12:15	Lunch		
	13:30	Compressor Flow Instability	Development of Gas Turbine Engine System	
	15:10	Break		
	15:30	Forum 2		
	17:10	Closing Address		

Keynote and Forum Sessions

Sessions are held in Room A (Komaba Convention Hall, An-202)

- **Keynote Lecture** August 25 (Tue) 17:00-17:50
 “Alternative Fuels and Energy Strategies for Gas Turbines”
 Prof. Dilip R. Ballal (ASME Vice President for IGTI, University of Dayton)
- **Keynote Speeches**
 - Keynote Speech 1** August 24 (Mon) 9:30-10:20
 “Fuel Cell-Gas Turbine Hybrids”
 Prof. Jeong Lak Sohn (Seoul National University, Korea)
 - Keynote Speech 2** August 25 (Tue) 9:30-10:20
 “Aero-Engine Business in IHI and Challenges to the Future”
 Yasuyuki Watanabe (IHI Corporation, Japan)
 - Keynote Speech 3** August 26 (Wed) 9:30-10:20
 “Unsteady Tip Leakage Flow and Perspectives to Stall Mechanism in Axial Compressors”
 Prof. Feng Lin (Institute of Engineering Thermophysics, Chinese Academy of Sciences, China)
- **Forum Sessions**
 - Forum 1** August 24 (Mon) 13:30-15:10
 “Current Energy Situation in Asia”
 - Forum 2** August 26 (Wed) 15:30-17:10
 “CO₂ Reduction and Environmental Issues in Asia”

Exhibition



Aug. 24 (Mon) a.m.

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
9:15	Opening Address		
9:30	[KS-1] Keynote Speech 1		
	Chairperson: Prof. T. S. Kim (Inha University, Korea)		
9:30	ACGT2009-KS1 Fuel Cell-Gas Turbine Hybrids <i>Prof. Jeong Lak Sohn(Seoul National University, Korea)</i>		
10:20	[A-1] Noise and Unsteady Phenomena	[B-1] Turbine Aerodynamics and Performance	[C-1] Advanced Gas Turbine System 1
	Chairperson: Dr. Naoki Tsuchiya (IHI Corporation, Japan)	Chairperson: Dr. Hisashi Matsuda (Toshiba Corporation, Japan)	Chairperson: Mr. Katsuhiko Ishida (Kawasaki Heavy Industries, Japan)
10:35	ACGT2009-TS01 Numerical Study on Rotor-Stator Interaction Noise around Fan <i>Junichi Kazawa(Japan Aerospace Exploration Agency, Japan), Yasuo Horiguchi, Osamu Nozaki, Kazuomi Yamamoto, Naoki Tsuchiya, Tsutomu Oishi</i>	ACGT2009-TS29 An Experimental Study of a Radial Inflow Turbine for an APU <i>Jeong-Seek Kang(Korea Aerospace Research Institute, Korea), Jae-Jun Yang, Bong-Jun Cha, lee-Ki Ahn, Dae-Sung Lee</i>	ACGT2009-TS56 Performance Analysis of a SOFC/GT Hybrid System Integrated with a Gasification Process <i>J.I. Choi, J.L. Sohn(Seoul National University, Korea), S.J. Song, T.S. Kim, Y.J. Joo</i>
11:00	ACGT2009-TS02 Experimental Study of Microjet Injection for Supersonic Jet Noise Reduction <i>Ryuichi Okada(University of Tokyo, Japan), Toshinori Watanabe, Seiji Uzawa, Takehiro Himeno, Tsutomu Oishi</i>	ACGT2009-TS30 Analysis of Turbine Performance Effects Raised by Geometry Variations between Manufactured Components and Design Intent <i>Pavlos K. Zachos(Cranfield University, UK), Anestis I. Kalfas, Pericles Pilidis</i>	ACGT2009-TS57 Influence of Syngas Composition on the Operating Characteristics of a Gas Turbine <i>Y.S. Kim, J.J. Lee, T.S. Kim(Inha University, Korea), J.L. Sohn</i>
11:25	ACGT2009-TS03 Unsteady Vortical Structure and Related Noise and Performance of a Centrifugal Compressor <i>Takashi Goto(Waseda University, Japan), Yutaka Ohta, Eisuke Ota</i>	ACGT2009-TS31 Detached-Eddy Simulation of Massively Separated Flow around Low-Pressure Turbine Blades under Several High-Lift Operating Conditions <i>Yoshihiro Ishikawa(Iwate University, Japan), Ken-ichi Funazaki, Kazutoyo Yamada</i>	ACGT2009-TS58 Study on Performance Test of the GT Block of an Integrated Gasification Combined Cycle Power Plant <i>Qi Wei(Shanghai Electric Power Generation Equipment Co., Ltd, China.), He Lei, Cui Yaixin, Xu Qiang</i>
11:50	ACGT2009-TS04 Development of Inlet Distortion Simulating Device for Gas Turbine Engine Inlet Distortion Test <i>Kyungjae Lee(Korea Aerospace Research Institute, Korea), Bohwa Lee, Sanghun Kang, Sooseok Yang</i>	ACGT2009-TS32 Experimental Investigations of Tip Injection in a High-turning Axial Turbine Cascade <i>Maosheng Niu, Shusheng Zang(Shanghai Jiao Tong University, China)</i>	ACGT2009-TS59 Successful Operation of the Gas Turbine for the Air-blown IGCC System <i>Yasuhiro Takashima, Yoshinori Hyakutake (Mitsubishi Heavy Industries, Ltd., Japan), Hiromi Ishii, Yosuke Kitauchi, Wataru Akizuki</i>
12:15			

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
	[Fm-1] Forum 1		
13:30	ACGT2009-Fm1 Current Energy Situation in Asia		
15:10			
	[A-2] Tip Leakage and 3D Flow in Turbomachinery	[B-2] Internal Cooling	[C-2] Advanced Gas Turbine System 2
	Chairperson: Prof. Yutaka Ohta (Waseda University, Japan)	Chairperson: Prof. Ken-ichi Funazaki (Iwate University, Japan)	Chairperson: Prof. Huang Weiguang (Institute of Engineering Thermophysics/CAS, China)
15:30	ACGT2009-TS05 Experimental Investigation on Tip Leakage Flow in a Linear Compressor Cascade <i>(Oral Presentation)</i> <i>Chengqin Li(Chinese Academy of Sciences, China), Feng Lin, Weiguang Huang</i>	ACGT2009-TS33 Single Hole Impingement Cooling at Low Range Reynolds Number <i>(Oral Presentation)</i> <i>H.R. Mohd Saiah, A.R. Abu Talib(Universiti Putra Malaysia, Malaysia), N. Abdullah, N.A. Abdul Jalil</i>	ACGT2009-TS60 Gas Turbine Performance Upgrade Technology and Verification <i>Yasuoki Tomita(Mitsubishi Heavy Industries, Ltd., Japan), Daisuke Hamajima, Neville Champ</i>
15:55	ACGT2009-TS06 Stream-wise Loss Evolution with Varying the Leakage Flow Tangential Velocity in Shrouded Axial Compressor Cascades <i>Jin Wook Kim(Seoul National University, Korea), Tongbeum Kim, Seung Jin Song</i>	ACGT2009-TS34 Optimal Cooling Design of Transverse Rib Turbulators in a Circular Channel <i>Kyung Min Kim, Beom Seok Kim, Dong Hyun Lee, Hoky Moon, Hyung Hee Cho(Yonsei University, Korea)</i>	ACGT2009-TS61 Parametric Analysis of the Performance of Water-recirculated Oxy-fuel Power Generation Systems <i>B.C. Park, J.L.Sohn(Seoul National University, Korea), T.S.Kim, Y.D.Lee, K.Y.Ahn, S.H.Kang</i>
16:20	ACGT2009-TS07 Three-Dimensional Separations in the Stator Passage of a Low-Speed Axial Compressor Stage <i>Xianjun Yu(Beijing University of Aeronautics and Astronautics, China), Zhibo Zhang, Baojie Liu</i>	ACGT2009-TS35 Local Heat/Mass Transfer in a Rotating Channel with Inclined Pin-Fin <i>Jun Su Park, Kyung Min Kim, Dong Hyun Lee, Hyung Hee Cho(Yonsei University, Korea), Minking K. Chyu</i>	ACGT2009-TS62 Experimental Study on Cycle Performance of Advanced Humid Air Turbine <i>Shigeo Hatamiya(Hitachi, Ltd., Japan), Hidefumi Araki, Shinichi Higuchi, Takanori Shibata, Tomomi Koganezawa, Shinya Marushima</i>
16:45	ACGT2009-TS08 Numerical Analysis of Flow Field in an Axial Compressor Rotor Under High Altitude Conditions <i>Taiki Kodama(University of Tokyo, Japan), Toshinori Watanabe, Takehiro Himeno, Seiji Uzawa</i>	ACGT2009-TS36 Experimental Study on Advanced Internal Cooling Technology for HP Turbine Airfoils <i>Shu Fujimoto(IHI Corporation, Japan), Yoji Okita, Yoshitaka Fukuyama, Takashi Yamane, Fujio Mimura, Masahiro Matsushita, Toyoaki Yoshida</i>	ACGT2009-TS63 Estimation of a Pre-Cooling Effect on the Small Pre-Cooled Turbojet Engine System <i>Kenichiro Maruyama(Tokyo University of Science, Japan), Hideyuki Taguchi, Daisaku Masaki, Hiroaki Kobayashi, Motoyuki Hongoh, Shinji Honami</i>
17:10	ACGT2009-TS09 Experimental and Numerical Research on a High Hub to Tip Ratio Centrifugal Compressor <i>Young-Seok Kang(Korea Aerospace Research Institute, Korea), Tae-Choon Park, Soo-Seok Yang</i>	ACGT2009-TS37 Effects of Air Coolant Parameters on a Turbine Blade with Latticework Internal Cooling Structure <i>P. Q. Guo, M. H. Huang, S. S. Zang(Shanghai Jiao Tong University, China), Y. Rao, H. F. Song</i>	ACGT2009-TS64 Alternative Fuels and Their Impact on the Turbofan Engine Design, and Performance under the Realistic Flight Conditions <i>Yoshitaka Fukuyama(Japan Aerospace Exploration Agency, Japan), Hitoshi Fujiwara, Keiichi Okai</i>
17:35			

Aug. 25 (Tue) a.m.

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
	[KS-2] Keynote Speech 2		
	Chairperson: Dr. Yoshiya Nakamura (INC Engineering, Japan)		
9:30	ACGT2009-KS2 Aero-Engine Business in IHI and Challenges to the Future <i>Yasuyuki Watanabe(IHI Corporation, Japan)</i>		
10:20			
	[A-3] Aerodynamic Components	[B-3] Heat Exchanger and Geometry Effect	[C-3] Combustion Analysis
	Chairperson: Prof. Seung Jin Song (Seoul National University, Korea)	Chairperson: Dr. Takashi Yamane (JAXA, Japan)	Chairperson: Mr. Masayoshi Kobayashi (Kawasaki Heavy Industries, Japan)
10:35	ACGT2009-TS10 Measurements and Analysis on the Flow Field by High-power Slot-type Piston Actuator <i>Liu He(Beijing University of Aeronautics and Astronautics, China), Dong Jinzhong, Wu Naiming</i>	ACGT2009-TS38 Development of a High Pressure and High Temperature Air-to-Air Heat Exchanger Test Facility <i>Tae Hoon Kim, Won Geun Yun, In Seak Kang, Man Yeong Ha(Pusan National University, Korea), Ji Hwan Jeong, Kui Soon Kim, Jong Rae Cho, Sang Hu Park, Jeung Sang Go, June Kee Min, Ho Seung Jeong</i>	ACGT2009-TS65 Accurate Combustion Chemistry Simulation in Gas Turbine Combustors <i>(Oral Presentation)</i> <i>Scott A. Drennan(Reaction Design, USA), Chen-Pang Chou, Anthony Shelburn, Devin Hodgson, Chitralkumar V. Naik, Ellen Meeks</i>
11:00	ACGT2009-TS11 Prediction of Transonic Flutter in Oscillating Cascades <i>Xiaowei Zhang(Beijing University of Aeronautics and Astronautics, China), Yanrong Wang</i>	ACGT2009-TS39 Investigation of Thermal Characteristics in Compact Recuperator <i>Zhou Guo-Yan(East China University of Science and Technology, China), Tu Shan - Tung, Ma Hu - Gen, Zhu Dongsheng</i>	ACGT2009-TS66 An Extended Heat Release Model of Turbulent Premixed Flame Response to Flow Perturbations <i>Ju Hyeong Cho(Korea Institute of Machinery and Materials, Korea), Han Seok Kim, Kook Young Ahn, Sang Min Lee</i>
11:25	ACGT2009-TS12 Numerical Study on a Supersonic Intake for Air-breathing Engine under Off-design Conditions <i>Takehiro Himeno(University of Tokyo, Japan), Motohiro Inoue, Toshinori Watanabe, Chihiro Inoue, Seiji Uzawa</i>	ACGT2009-TS40 Effect of Juncture Geometry between Endwall and Airfoil Leading Edge on Endwall Heat Transfer <i>Junichi Seguchi(Osaka University, Japan), Kenichiro Takeishi, Satoshi Hada, Yutaka Oda, Yoshihiro Nuta</i>	ACGT2009-TS67 Prediction Methodology of Fuel-NOx Emissions in Gasified Fuels' Combustion <i>Takeharu Hasegawa(Central Research Institute of Electric Power Industry, Japan)</i>
11:50	ACGT2009-TS13 Studies on Characteristic Frequency and Length-Scale of Shock-Induced Motion in Transonic Diffuser Using High-Order LES Approach <i>Debasish Biswas(Toshiba Corporation, Japan), Tomohiko Jimbo</i>	ACGT2009-TS41 Measurement of Heat and Fluid Flow on Surface with Teardrop-Shaped Dimples <i>Satomi Nishida(Tokyo Univ. of Agriculture & Technology, Japan), Akira Murata, Hiroshi Saito, Kaoru Iwamoto</i>	
12:15			

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
	[A-4] CFD Analysis and Optimization	[B-4] Numerical Analysis of Heat Transfer Characteristics	[C-4] Combustor Development
	Chairperson: Dr. Debasish Biswas (Toshiba Corporation, Japan)	Chairperson: Prof. Kenichiro Takeishi (Osaka University, Japan)	Chairperson: Mr. Takeshi Yamamoto (JAXA, Japan)
13:30	ACGT2009-TS14 Optimisation of Non-axisymmetric Endwalls in Transonic Axial-flow Compressor <i>(Oral Presentation)</i> <i>Xingen Lu(Chinese Academy of Sciences, China), Junqiang Zhu, Chaoqun Nie, Weiguang Huang</i>		ACGT2009-TS68 Development of a Lean Staged Combustor in ECO Engine Project <i>Ryusuke Matsuyama(Kawasaki heavy industries, Ltd., Japan), Hideki Ogata, Takeo Oda, Atsushi Horikawa, Yasuhiro Kinoshita</i>
13:55	ACGT2009-TS15 Biologically Inspired Design System for Turbomachinery Applications <i>Jason Bakogiannis(Aristotle University, Greece), Christos Kallianteris, Anestis I. Kalfas</i>	ACGT2009-TS43 Investigation of Heat Transfer Characteristics of Gas Turbine Transient Mode by Numerical Approach <i>Dong Hwa Kim(Doosan Heavy Industries & Construction Co.,Ltd, Korea), Joungseok Kim, Hyun Lee, Oleksandr Gurinov, Beomsoo Kim</i>	ACGT2009-TS69 An Experimental Study of Combustion Characteristics in a Model Gas Turbine Combustor <i>Jangsu Lee, Min-Ki Kim, Seongsoon Park, Youngbin Yoon(Seoul National University, Korea)</i>
14:20		ACGT2009-TS44 Conjugate Heat Transfer Calculation of Cooled Gas Turbine Vanes <i>(Oral Presentation)</i> <i>Joung Seok Kim(Doosan Heavy Industries & Construction Co.,Ltd, Korea), Woo Sang Lee, Dong Hwa Kim, Soo Yong Kim</i>	ACGT2009-TS70 Development of Air Cooled Combustor for Mitsubishi G Class Gas Turbine <i>Keizo Tsukagoshi, Yoshinori Hyakutake, Hisato Arimura, Katsunori Tanaka, Hiroaki Kishida (Mitsubishi Heavy Industries, Ltd., Japan), Kentaro Tokuyama</i>
14:45	ACGT2009-TS17 Numerical Simulation of Sand Erosion in a Transonic Compressor Rotor <i>Masaya Suzuki(Tokyo University of Science, Japan), Makoto Yamamoto</i>	ACGT2009-TS45 Conjugate Heat Transfer Simulation Using Overset Grid Method <i>Takashi Yamane(Japan Aerospace Exploration Agency, Japan), Kazuomi Yamamoto</i>	ACGT2009-TS71 Development of Gas Turbine Combustor for Each Gasified Fuel <i>Takeharu Hasegawa(Central Research Institute of Electric Power Industry, Japan)</i>
15:10			

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
	[A-5] Structures and Manufacturing	[B-5] Film Cooling	[C-5] Flameless Combustion
	Chairperson: Dr. Kosuke Isomura (IHI Corporation, Japan)	Chairperson: Dr. Yoshitaka Fukuyama (JAXA, Japan)	Chairperson: Mr. Tomoya Murota (Hitachi Ltd., Japan)
15:30	ACGT2009-TS18 Numerical and Experimental Investigation on Dynamic Characteristics of a High Speed Rotor with Complex Structure for Micro-gasturbine Impeller <i>(Oral Presentation)</i> Qiang Yan(Lanzhou University, China), Xie Yonghui	ACGT2009-TS46 Study on the Film Cooling Blowing through Circular and Shaped Film Cooling Holes with Swirling Coolant Flow Yuta Egawa(Osaka University, Japan), Kenichiro Takeishi, Tsuyoshi Kitamura	ACGT2009-TS72 Experimental Investigation on Syngas' Flameout Limitations and Emissions in Flameless Combustion Xuan Lv(Chinese Academy of Sciences, China), Yufeng Cui
15:55	ACGT2009-TS19 Calculation Model of Bump-Type Foil Bearing with Shell and Link-Spring Structure Kai Feng(University of Tokyo, Japan), Shigehiko Kaneko	ACGT2009-TS47 Film Cooling Effectiveness of Staggered Rectangular Holes with High Turbulence Intensity Flow Dong Hyun Lee, Young Bong Kim, Dong-Ho Rhee, Kyung Min Kim, Hyung Hee Cho(Yonsei University, Korea)	ACGT2009-TS73 Experimental and Numerical Investigation of a Flameless Model Combustor Aibing Fang(Chinese Academy of Sciences, China), Gang Xu
16:20	ACGT2009-TS20 Multi-physics Simulations of Electrochemical Machining Process for Compressor Blade Ryo Tsuboi(Tokyo University of Science, Japan), Shinya Sasaki, Makoto Yamamoto	ACGT2009-TS48 Studies on Aero-Thermal Characteristics of High-Pressure Turbine Vanes with Endwall Film Cooling under the Influence Upstream Leakage Flows Ken-ichi Funazaki(Iwate University, Japan), Takeshi Horiuchi, Kenta Fujimura, Yoji Okita	ACGT2009-TS74 Combustion Characteristics of Flameless Combustion in a Small Size Gas Turbine Combustor Fuelled by Low Calorific Gas Mitsuaki Tanaka, Masato Hiramatsu, Shigeru Hayashi, Shigehiko Kaneko(University of Tokyo, Japan), Yudai Yamasaki
16:45			
	[KL] Keynote Lecture		
	Chairperson: Prof. Toshinori Watanabe (University of Tokyo, Japan)		
17:00	ACGT2009-KL Alternative Fuels and Energy Strategies for Gas Turbines Prof. Dilip R. Ballal(University of Dayton)		
17:50			
17:50			
18:10	Awards Ceremony		

Aug. 26 (Wed) a.m.

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
	[KS-3] Keynote Speech 3		
	Chairperson: Prof. Xiaofeng Sun (Beihang University, China)		
9:30	ACGT2009-KS3 Unsteady Tip Leakage Flow and Perspectives to Stall Mechanism in Axial Compressors <i>Prof. Feng Lin(Institute of Engineering Thermophysics, Chinese Academy of Sciences, China)</i>		
10:20	[A-6] Stall and 3D Instability	[B-6] Monitoring and Control	[C-6] Combustion Instability and Numerical Analysis
	Chairperson: Prof. Susumu Teramoto (University of Tokyo, Japan)	Chairperson: Dr. Hisao Futamura (JAXA, Japan)	Chairperson: Dr. Mitsumasa Makida (JAXA, Japan)
10:35	ACGT2009-TS21 3D Unsteady Computation of Stall Inception in Axial Compressors <i>Baofeng Tu(College of Energy and Power Engineering, China), Jun Hu, Yong Zhao</i>	ACGT2009-TS49 Remote Monitoring for Power Generation Equipment <i>Naotaka Mikami, Shintaro Kumano(Mitsubishi Heavy Industries, Ltd., Japan), Isao Moriwaki, Erika Funabiki</i>	ACGT2009-TS75 Numerical Study on the Characteristics of Turbulent Syngas Flames <i>Sungmo Kang, Jeongwon Lee, Yongmo Kim(Hanyang University, Korea), Yongjin Joo</i>
11:00	ACGT2009-TS22 Effects of Multi-Passage Numerical Simulation Models on the Propagation of Tip Leakage Flow Unsteadiness <i>Shaojuan Geng(Chinese Academy of Sciences, China), Feng Lin, Jingyi Chen, Hongwu Zhang, Lei He</i>	ACGT2009-TS50 Identification of Jet Engine Dynamics <i>Mai Kimura(IHI Corporation, Japan), Daiki Kakiuchi, Hiroyuki Furukawa, Takeshi Tagashira, Takuya Mizuno</i>	ACGT2009-TS76 The Effect of Perforated Liner with Bias Flow on the Control of Combustion Instability <i>Lei Li, Zhihui Guo, Chengyu Zhang, Xiaofeng Sun(Beijing University of Aeronautics and Astronautics, China)</i>
11:25	ACGT2009-TS23 Influence of Tip-Leakage Vortex Breakdown on Stall Inception Pattern in an Axial Flow Fan <i>Takahiro Nishioka(Hitachi, Ltd., Japan), Toshio Kanno, Hiroshi Hayami</i>		ACGT2009-TS77 Experimental Study and Numerical Simulation on Combustion Instabilities of Lean Premixed Swirl Flame <i>Zhihui Guo(Beijing University of Aeronautics and Astronautics, China), Lei Li, Chengyu Zhang, Xiaofeng Sun</i>
11:50	ACGT2009-TS24 Effect of Advanced Casing Treatment on the Suppression of Precursor of Rotating Stall in Axial Flow Compressors <i>Dakun Sun, Ruiwei Hou, Xiaohua Liu, Xiaofeng Sun(Beijing University of Aeronautics and Astronautics, China)</i>		ACGT2009-TS78 Liquid Sheet Dynamics and Primary Breakup Characteristics at Fuel Injector <i>Chihiro Inoue(University of Tokyo, Japan), Toshinori Watanabe, Takehiro Himeno, Seiji Uzawa</i>
12:15			

Aug. 26 (Wed) p.m.

	Room A Komaba Convention Hall An-202	Room B Main Conference Room An-302	Room C Medium Seminar Room An-402
	[A-7] Compressor Flow Instability	[B-7] Development of Gas Turbine Engine System	
	Chairperson: Prof. Makoto Yamamoto (Tokyo University of Science, Japan)	Chairperson: Prof. Seung Jin Song (Seoul National University, Korea)	
13:30	<p>ACGT2009-TS25 Investigating the Factors that Influence the Frequency of Self-Induced Unsteady Tip Clearance Flow</p> <p><i>Juan Du(Chinese Academy of Sciences, China), Feng Lin, Jingyi Chen, Weiguang Huang, Wei Qi</i></p>	<p>ACGT2009-TS52 Issues in Designing a 30 kW_e Micro Turbine for an Organic Rankine Cycle (ORC) <i>(Oral Presentation)</i></p> <p><i>Hyun Joong Kim(Seoul National University, Korea), Seung Jin Song</i></p>	
13:55	<p>ACGT2009-TS26 A Study of Stall Onset Stage in a Low Speed Research Compressor</p> <p><i>Hyung-Soo Lim(Seoul National University, Korea), Young-Cheon Lim, Seung-Jin Song, Shin-Hyoung Kang</i></p>	<p>ACGT2009-TS53 Mitsubishi Large Frame Gas Turbines Latest Development for High Efficiency</p> <p><i>Keizo Tsukagoshi, Hisato Arimura, Junichiro Masada, Toshishige Ai, Eisaku Ito, Jun Yasuraoka (Mitsubishi Heavy Industries, Ltd., Japan)</i></p>	
14:20	<p>ACGT2009-TS27 Theoretical and Experimental Investigations of Rotating Stall Inception in Axial Flow Compressors</p> <p><i>Dakun Sun, Xiaohua Liu, Xiaofeng Sun(Beijing University of Aeronautics and Astronautics, China)</i></p>	<p>ACGT2009-TS54 Replacement Plan of Sendai Thermal Power Station, Unit No.4</p> <p><i>Hideki Chiba, Hiroki Takahashi(Tohoku Electric Power Company, Inc., Japan), Yoichi Iwasaki, Hidehiko Nishimura</i></p>	
14:45	<p>ACGT2009-TS28 Three-Dimensional Numerical Simulation of Entire Surge Cycle of a Multi-Stage High-Speed Compressor</p> <p><i>Susumu Teramoto(University of Tokyo, Japan)</i></p>	<p>ACGT2009-TS55 JAXA Clean Engine Technologies Development Initiative</p> <p><i>Hisao Futamura(Japan Aerospace Exploration Agency, Japan), Yoshitaka Fukuyama, Toshio Nishizawa, Ryoji Yanagi</i></p>	
15:10			
	[Fm-2] Forum 2		
15:30	<p>ACGT2009-Fm2 CO2 Reduction and Environmental Issues in Asia</p>		
17:10			
17:10	Closing Address		

General Information

■ Language

The official language of ACGT2009 is English.

■ Registration and Information Desk

Aug. 24(Mon)	08:40 - 18:00
Aug. 25(Tue)	09:10 - 18:00
Aug. 26(Wed)	09:10 - 12:00 at 2 nd floor in “An-bldg.”

■ For Speakers in Technical Sessions

1. Author biography form

Presenting authors, who haven't submitted the biography form to chairperson, should fill out the form and hand it over to chairperson before their sessions start.

2. Arrival at the session room

All speakers should arrive at their session rooms well before their sessions start. Authors who will use the beam projector can upload the presentation files to the PC equipped in the room. Authors can use their own PC on their own responsibility. All the time required for the computer setting for presentation will be included in their presentation time.

3. Presentation time

25 minutes, including 5 minutes for discussion, are allotted to each presentation.

■ For Chairperson in Technical Sessions

Session chairpersons should arrive at the session room well before the session begins. Check if all presenting authors come and their biography forms have been submitted. Please keep the allocated presentation time and allow sufficient time for discussion.

■ Registration

The registration fee is 20,000JPY (5,000JPY for students). The registration fee includes access to all sessions, final program with paper abstracts, CD-ROM proceedings, and banquet.

■ Proceedings

CD-ROM Proceedings will be distributed to all registrants. Additional Proceedings are available at the price of 10,000JPY.

■ Lunch

Restaurants are located on the 1st floor of “An bldg.”. COOP restaurant is also open in Komaba Research Campus.

■ Banquet

From 18:40 on Aug.25(Tue), banquet will be held at Komaba Faculty House in Komaba Campus, University of Tokyo. It takes 10-minutes walk from An-bldg. in Institute of Industrial Science. The direction map is shown in this book.