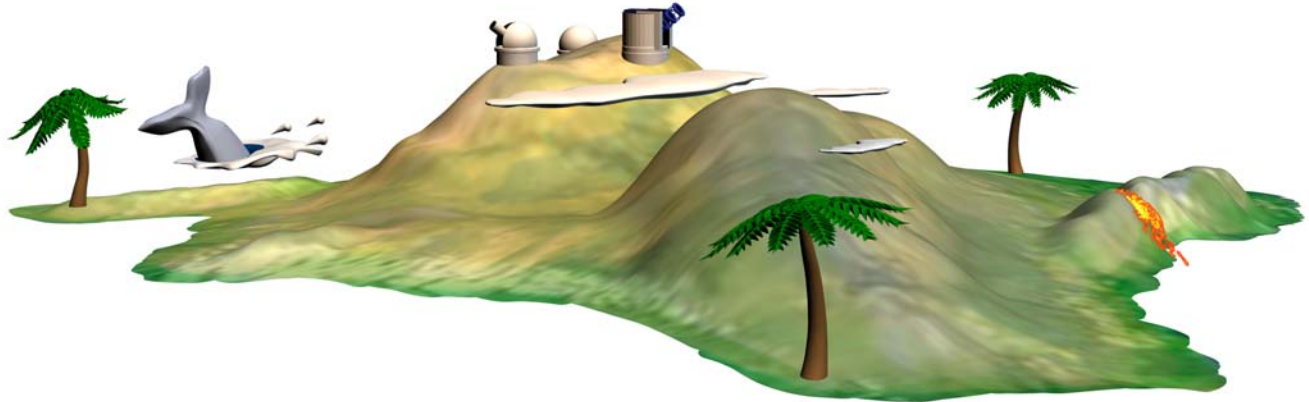




INTERNATIONAL FLAME RESEARCH FOUNDATION

American – Japanese Flame Research Committees  
International Symposium

Advances in Combustion Technology:  
Improving the Environment and Energy Efficiency



**Waikoloa Beach Marriott, Hawaii - Oct. 21 –24, 2007**

**AFRC Conference Chairman:**  
**Dr. Richard T. Waibel**  
John Zink Co., LLC

**JFRC Conference Chairman:**  
**Susumu Mochida**  
Nippon Furnace Kogyo

**Early Bird Symposium Check in & Registration**

4:30pm to 5:30pm Sunday Oct. 21, 2007

**Welcome Reception**

5:30pm to 7pm Sunday Oct. 21, 2007

## AFRC-JFRC 2007 Joint International Symposium

**Monday October 22**

7:15	<b>Registration/Continental Breakfast</b>
	<b>Alii Ballroom</b>
8:15	<b>Welcome &amp; Introduction - Alii Ballroom</b>
8:30	Emissions and Control of Trace Metals During Combustion Processes Prof. I. Naruse, Nagoya Univ.
9:30	High Temperature Air Combustion: Energy Savings, Pollution Reduction and Fuel Reforming Prof. Ashwani Gupta, Univ. of Maryland
10:30	<b>Break</b>

	<b>Paniolo I Low NOx Burners I</b>	<b>Alii Ballroom CFD &amp; Mathematical Modeling I</b>	<b>Paniolo II Sensors &amp; Diagnostics I</b>
	Session Chair -	Session Chair -	Session Chair -
11:00 AM	<b>Development of an Improved Ultra Low NOx Boiler Burner</b> Tim Webster, John Zink Co., LLC	<b>Modeling Lean Premixed Combustion in Process Furnaces with Ultra-Low NOx Burners</b> B. Adams, Q. Tang & J. Ma, Reaction Engineering International and D. Brown, Stone & Webster	<b>Wavelength-Multiplexed Diode Laser Spectroscopy for Closed Loop Combustion Control and Optimization</b> Andrew D. Sappey, Zolo Technologies, Inc.
11:30 AM	<b>Utilizing Benchmarks in the Design and Commercialization of Lean Premix Low NOx Burners</b> Kurt Kraus, Callidus Technology	<b>Use of Integral Burners in ethylene cracking heaters: CFD modeling and experimental data</b> P. J. Ponzi, F. Bertola & R. J. Gartside, ABB Lummus	<b>Progress Towards the Development of a Tunable Diode Laser Sensor for Industrial Applications</b> J. L. Bergmans, Bergmans Mechatronics, LLC and T. P. Jenkins, MetroLaser, Inc.
Noon	<b>Lunch Low NOx Burners II</b>	<b>Lunch CFD &amp; Mathematical Modeling II</b>	<b>Lunch Sensors &amp; Diagnostics II</b>
	Session Chair -	Session Chair -	Session Chair -
1:30 PM	<b>Controlling Flame Conditions and Minimizing Pollutants with Next Generation Burner Technology</b> A. Castell, P. Newman & R. Withnall, Hamworthy Combustion	<b>Optimization of a Multi-Cell Platformer Heater Using CFD Modeling</b> M. Henneke, CD-Adapco, L. D. Wilson, Marathon Petroleum, R. Patel, Onquest, Inc., D. Clary, UOP, LLC & R. T. Waibel, John Zink Co., LLC	<b>Continuous Online Diagnostic Measurement and Intelligent Control of Various Combustion Applications of Burners and Furnace Operations</b> D. Schmidt, Increase Performance, Inc.
2:00 PM	<b>Flameless Combustion for Direct Fired Heaters to Reduce Emissions and Increase Efficiency</b> William Gibson, Great Southern Flameless, LLC (No Presentation)	<b>Validation of LES based Predictions of Heat Flux to Objects in Transport Fuel Fires</b> J.N. Thornock, J. C. Spinti, S. Borodai, S. H. Brown & P. Smith, Univ. of Utah	
2:30 PM	<b>Break Oxy Combustion I</b>	<b>Break CFD &amp; Mathematical Modeling III</b>	<b>Break Flares I</b>
	Session Chair -	Session Chair -	Session Chair -
3:00 PM	<b>Radiative Heat Transfer in Oxy-Fuel Flames for Solid and Gaseous Fuels</b> Klas Andersson, R. Johansson, F. Johnsson, Chalmers Univ. of Tech.	<b>A Particle Model for Investigation of Deposits in Heat Recovery Boiler</b> A. Brink, B. Li & M. Huppa, Abo Akademi Univ.	<b>Pressure Assisted Flare Emissions Testing</b> V. Varner, Dow Chemical and S. Fox & R. Schwartz, John Zink Co., LLC
3:30 PM	<b>Recent Air Liquide developments in oxy fuel for high temperature processes</b> B. Leroux, R. Tsiava, P. Pranda & B. Jurcik, Air Liquide	<b>Modeling Combustion of Large Biomass Particles</b> A. Brink, O. Karlstrom & M. Huppa, Abo Akademi Univ. and M. Jarvinen & C. Fogelholm, Helsinki Univ. of Technology	<b>LES Analysis of Sour Gas Flare Emissions under Variable Wind Conditions</b> C. Thurston & P. Smith, Univ. of Utah & A. Chambers, Alberta Research Council
	4:10 PM	<b>AFRC Business Meeting</b>	

## AFRC-JFRC 2007 Joint International Symposium

**Tuesday October 23**

7:30	<b>Registration/Continental Breakfast</b>
8:00	<b>International Flame Research Foundation: The IJmuiden Years</b> <small>Peter Roberts, The Roberts Group</small>
9:00	<b>International Flame Research Foundation: Moving Forward from Tuscany</b> <small>Prof. Leonardo Tognotti, Univ. of Pisa</small>
10:00	<b>Break</b>

### Paniolo I Oxy Combustion II

### Aiii Ballroom CFD & Mathematical Modeling IV

### Paniolo II Flares II

	Session Chair -	Session Chair -	Session Chair -
10:30 AM	<b>Pilot Furnace Trials with Low NO<sub>x</sub> with Air and Oxyfuel Combustion</b> <small>A. Rensgard, D. Malmberg &amp; J. Niska, MEFOS and M. Mortberg, R. Tsiava &amp; B. Leroux, Air Liquide</small>	<b>An Ash Deposition Post-processor for Biomass Co-Firing in Boilers or Furnaces</b> <small>C. Bertrand &amp; R. Korbee, Energy Centre of the Netherlands and M. Losurdo, Delft Univ. of Tech.</small>	<b>Scaling Relations for Flare Interactions, Flame Lengths and Crosslighting Requirements in Large Flare Fields</b> <small>Werner J. A. Dahm, Univ. of Michigan</small>
11:00 AM	<b>Development of an Oxycoal Burner for Pulverised Fuel Combustion at Low O<sub>2</sub> Concentrations</b> <small>D. Toporov, M. Forster &amp; R. Kneer, RWTH Aachen Univ.</small>	<b>A Three-Dimensional Mathematical Model for the Strong-jet/Weak-jet Configuration</b> <small>Y. J. Lee, E. W. Grandmaison &amp; M. D. Matovic, Queen's Univ.</small>	<b>Environmental Testing of an Advanced Flare Tip for a Low-Profile Flare Burning Ethylene</b> <small>S. Smith, J. Modi, J. M. McDonald &amp; C. Little, Zeeco and J. D. Smith &amp; L. M. Berg, Alion Sci. and Tech.</small>
11:30 AM	<b>Production of Powdered Activated Carbon for Mercury Capture Using Hot Oxygen</b> <small>L. E. Bool, III &amp; L. J. Rosen, Praxair</small>	<b>Heat Flux Models for Ethylene Furnaces</b> <small>Joseph Colannino, John Zink Co., LLC</small>	<b>Optimisation Study of Elevated Staged Flares for Large Gas Plants</b> <small>R. Damico, A. Mermet-Guyennet &amp; A. Castell, Hamworthy Combustion</small>
Noon	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
	<b>Emissions &amp; Flame Studies I</b>	<b>High Temperature Air Combustion I</b>	<b>Flares III</b>
	Session Chair -	Session Chair -	Session Chair -
1:30 PM	<b>Characterization of Flameless Combustion of Natural Gas in a Strong-Jet/Weak-Jet Furnace</b> <small>Y. He, Y. J. Lee, M. D. Matovic &amp; E. W. Grandmaison, Queen's Univ.</small>	<b>Demonstration Plant Phase Development on Advanced High-Temperature Air Combustion Technology for Steam Reforming Process</b> <small>N. Onda, T. Mikuriya &amp; T. Yoshioka, Chiyoda Co. and S. Mochida, H.Nakamura &amp; T. Araake, Nippon Furnace Co.</small>	<b>Evaluation of the Air-Demand, Flame Height and Radiation Load on the Wind Fence of a Low-Profile Flare Using ISIS-3D</b> <small>J. D. Smith &amp; A. Suo-Ahttila, Alion Sci, and Tech. and S. Smith &amp; J. Modi, Zeeco</small>
2:00 PM	<b>Alternative Fuels' Burning Rate Characterisation Studies and Their Application in a New Gas Turbine Research Center</b> <small>A. Crayford, P. Kay, S. M. Morris &amp; P. J. Bowen, Cardiff School of Engineering and P. A. Roberts, The Roberts Group</small>	<b>Large size single-type regenerative burner for High Temperature Air Combustion</b> <small>H. Nakamura, T. Araake &amp; S. Mochida, Nippon Furnace Co., LTD</small>	<b>Computational Fluid Dynamics Modeling of a Ground Flare</b> <small>Brian Duck, Callidus Technology</small>
2:30 PM	<b>Thermoacoustic Investigation of a Low-Swirl Burner in a Rijke Tube</b> <small>S. Abbilian &amp; D. Dunn-Rankin, Univ. of California at Irvine</small>	<b>Small Capacity Regenerative Burners</b> <small>Joachim G. Wuening, WS Inc.</small>	<b>Comparison of Empirically Based Calculation Methods for Pipe Flares to Computational Fluid Dynamics</b> <small>Matthew Martin, Callidus Technology</small>
3:00 PM	<b>Break</b>	<b>Break</b>	<b>Break</b>
	<b>Emissions &amp; Flame Studies II</b>	<b>High Temperature Air Combustion II</b>	<b>Flares IV</b>
	Session Chair -	Session Chair -	Session Chair -
3:30 PM	<b>Understanding the Dynamics of Spark-AssistedHCCI Combustion</b> <small>K. D. Edwards, C. S. Daw, R. M. Wagner &amp; J. B. Green, Jr., Oak Ridge National Lab</small>	<b>Development of Energy Efficient Burners for Steel Plant Applications</b> <small>P.K. Tripathi, Prabhat Kumar, T. S. Reddy, M. Sen, I.N.P. Gupta &amp; R. Banerjee, Steel Authority of India, Ltd</small>	<b>Improving Flare Design, A Transition from Art-Form to Engineering Science</b> <small>David Shore, Flaregas Corp.</small>
4:00 PM	<b>Numerical Investigation on NO<sub>x</sub> Emission Characteristics of Dimethyl Ether/Air Nonpremixed Flames</b> <small>C. H. Hwang, T. H. Kim &amp; C. E. Lee, Inha Univ.</small>	<b>AFTC: A General Fuel-Air Combustion Code for Municipal Solid Waste MSW Burning under High Temperature Air Combustion HITAC Conditions</b> <small>David G. Lilley, Lilley &amp; Associates</small>	<b>Flaring of Gas Mixtures Containing H<sub>2</sub>S</b> <small>A. K. Chambers &amp; M. Stroscher, Alberta Research Council</small>

## AFRC-JFRC 2007 Joint International Symposium

**Wednesday October 24**

**Continental Breakfast**

7:30

	<b>Paniolo I</b> <b>Emissions &amp; Flame Studies III</b>	<b>Hardware Development I</b>	<b>Paniolo II</b> <b>Solid &amp; Liquid Combustion I</b>
	Session Chair -	Session Chair -	Session Chair -
<b>8:00 AM</b>	<b>Products of Incomplete Combustion (PIC) from Petroleum, Petrochemical &amp; Chemical Sector Process Heaters and Industrial Boilers</b> James G. Seebold, Chevron(Retired) and R. T. Waibel, John Zink Co., LLC	<b>Development of New Process Utilizing Combustion Technology</b> K. Tomozawa, K. Taniyama, M. Uede & K. Fujii, Chugai Ro and I. Mukoyama, K. Myojin & T. Ogihar, Univ. of Fukui	<b>Structure and Content of a Solid Fuel Combustion Characterisation Database</b> Leo Tognotti, IFRF
<b>8:30 AM</b>	<b>Molecular Markers for Combustion Aerosols by Thermal Desorption/Gas Chromatography/Mass Spectrometry</b> J. C. Chow, J. G. Watson, SSH Ho, K. Veropoulos & L.-W. A. Chen, Desert Research Inst. And J. Yu, Hong Kong Univ. of Sci. & Tech.	<b>Super High Temperature Steam Gasification for Biomass and/or Plastic Wastes</b> T. Abe, S. Mochida, NFK & A. Gupta, Univ. of Maryland	<b>Low grade fuel gas production from peat and biomass in a fluidised bed reactor</b> B. M. Gibbs & W. Nimmo, Univ. of Leeds
<b>9:00 AM</b>	<b>Carbonaceous Measurements from Laboratory Controlled Combustion Sources</b> J. G. Watson, J. C. Chow, D. A. Sodeman, L.-W.A. Chen & P. Doraiswamy, Desert Research Inst. And N. Motallebi, CARB	<b>Numerical Investigation of a Gas Jet Diffusion Flame Enveloped by a Cascade of Venturis in a Swirling Air Stream</b> Ala R. Qubbaj, Univ. of Texas Pan American.	<b>Comparison of Combustion Characteristics of Upgraded Brown Coal (UBC) and Bituminous Coal</b> K. Akiyama & T. Tada, Kobe Steel, Ltd
<b>9:30 AM</b>	<b>Measurement of PM<sub>2.5</sub> Emissions from the Combustion of Various Fuels for Heat and Power Generation</b> S. Win Lee, T. Herage & B.Young, CANMET	<b>Efficient Utilization of Steel Mill By-product Fuels for High Temperature Heating Processes</b> David Schalles, Bloom Engineering Co., Inc.	<b>Thermal Energy Recovery from Wet Biomass by Hydrothermal Oxidation</b> K. Hirosaka, K. Koido & T. Hasegawa, Nagoya Univ.
<b>10:00 AM</b>	<b>Break</b>	<b>Break</b>	<b>Break</b>
		<b>Hardware Development II</b>	<b>Solid &amp; Liquid Combustion II</b>
		Session Chair -	Session Chair -
<b>10:30 AM</b>	<b>Size Selective Sampling and Analysis of Particulate Matters (PM10) in Urban and Rural Areas in Bangkok and Nakornpratom, Thailand</b> S. Suvachittanont & T. Praserttachato, Kasetsart Univ. W. W. Szymanski, Univ. of Vienna and M. Furuuchi, Kanazawa Univ. <b>(No Presentation)</b>	<b>Controlling Acoustic Coupling by Enhancing Heater Damping</b> M. Fleifil, John Zink Co., LLC	<b>The potential of waste tyre for NOx control by reburning</b> W. Nimmo, S. Singh, B. M. Gibbs & P. T. Williams, Univ. of Leeds
<b>11:00 AM</b>		<b>Enhancement of Burner Stability through the Application of Slotted Nozzles</b> J. Pulice & T. Webster, John Zink Co. and J. Li, Air Products and Chemicals, Inc.	<b>Structural Collapses and Inhomogeneous Flow Conditions in Fixed-Bed Combustion</b> S. Hermansson, A. Brink & H. Thunman, Chalmers Univ. of Tech.
<b>11:30 AM</b>		<b>Efficient Generation of Swirling Flow</b> N. Syred & P. Bowen, Cardiff School of Engineering and P. Roberts, The Roberts Group	<b>Combustion Optimization of an Oil-Fired Boiler in Mexico for Particulate and NOx Emissions Control</b> C. E. Romero, R. Moreno, N. Sarunac, H. Bilirgen & Z. Yao, Lehigh Univ., F. Hernandez, G. Ronquillo, J. L. Sanchez & R. Coria, Centro de Ingenieria y Desarrollo Industrial and A. Hernandez, B. Lara & A. Ondonez, Comision Federal de Electricidad
<b>Noon</b>		<b>Symposium Concludes</b>	