



UNIVERSITY OF
SASKATCHEWAN



**COMBUSTION INSTITUTE CANADIAN SECTION
2015 SPRING TECHNICAL MEETING PROGRAM**

MONDAY, May 11, 2015

15:00 – 17:00	Informal CICS Board Meeting – Engineering 2A15
17:00 – 20:00	Registration and Reception – Private Dining Room, Marquis Hall

TUESDAY, May 12, 2015

7:30 – 8:00	On-site Registration (Physics 103)
8:00 – 8:15	Welcome & Opening Remarks: Physics 103
8:15 – 9:00	Plenary Lecture 1: Flaring in the Energy Industry: The Canonical Combustion Problem with Critical Global Implications Professor Matthew Johnson, Carleton University, Physics 103 Chair: D. Torvi
	T1: Computational Fluid Dynamics Chair: D. Torvi
9:10 – 9:30	CF1: LES Simulation of the Delft-Jet-In-Hot-Coflow (DJHC) Burner Using Conditional Source-term Estimation <i>JW Labahn, CB Devaud</i>
9:30 – 9:50	CF2: A Conditional Dynamic Sub-Grid Model for Large Eddy Simulation of Non-Premixed Turbulent Combustion <i>GR Hendra, MM Salehi, WK Bushe</i>
9:50 – 10:20	Break: Agriculture Atrium

CICS Program Tuesday May 12 (cont.)		
	AGRICULTURE 2E25	AGRICULTURE 1E85
	T2: Comp Fluid Dynamics (cont) Chair: J. Bergthorson	T3: Soot and Particulates Chair: W. Hallett
10:20 – 10:40	CF3: Numerical Simulations of Turbulent V-Shaped Flames <i>D Dovizio, A Debbagh, CB Devaud</i>	SP1: Development of a Unique Function for Soot Surface Reactivity During Oxidation and Surface Growth in Laminar Diffusion Flames <i>A Khosousi, SB Dworkin</i>
10:40 – 11:00	CF4: Conditional Source-Term Estimation Using Dynamic Ensemble Selection and Iterative Solution <i>H Tsui, WK Bushe</i>	SP2: The Effects of a Double Bond & its Position on Soot Volume Fraction in Laminar Coflow Diffusion Flames of 1-Decene & 5-Decene Compared With n-Decane <i>J Weingarten, M Kholghy, MJ Thomson</i>
11:00 – 11:20	CF5: Numerical Investigation of a Turbulent Non-Premixed Methanol Jet Flame Using Conditional Source-Term Estimation <i>S Lee, CB Devaud</i>	SP3: Development and Testing of a Soot Particle Concentration Estimator Using Lagrangian Post-processing <i>R Alexander, S Bozorgzadeh, A Khosousi, SB Dworkin</i>
11:20 – 11:40	CF6: Validation of LEM Formulated PDF and Scalar Dissipation Rate Models for Turbulent, Premixed Methane Air Flames <i>H Tsui, MM Kamal, S Hochgreb, WK Bushe</i>	SP4: Role of PAH-Soot Equilibrium on Predicting Soot Particle Size Distributions in Premixed Flames <i>A Veshkini, N Eaves, SB Dworkin, MJ Thomson</i>
11:40 – 13:30	Lunch: Marquis Culinary Centre Board of Directors Meeting: Engineering 2A15	
	AGRICULTURE 2E25	AGRICULTURE 1E85
	T4: Engines I Chair: M. Birouk	T5: Fire Science I Chair: T. Wiens
13:30 – 13:50	EN1: Investigation of Combustion and Emission Characteristics of Neat n-Butanol in an HCCI Engine <i>T Yanai, S Dev, X Han, J Tjong, M Zheng</i>	FS1: Effect of Elevated Temperature on Cured Conditions of Carbon Fiber Epoxy Laminates <i>D Cree</i>
13:50 – 14:10	EN2: Sources of Particulate Matter Emissions Variability from a Gasoline Direct Injected Engine <i>M Ramos, K Rais, JS Wallace</i>	FS2: Combined Effects of Laundering and Abrasion on the Protective Performance of Flame Resistant Fabrics <i>C Vanderschaaf, J Batcheller, D Torvi</i>

CICS Program, Tuesday May 12 (cont.)		
14:10 – 14:30	EN3: Experimental Study of a Spark-Ignition IC Engine Performance Fuelled with Biobutanol-Gasoline Blend <i>A Ali, C Cope, HD Ng</i>	FS3: A Modified Method to Evaluate Flammability of Forest Fuels Using Oxygen Consumption Calorimetry <i>SA Paskaluk, MYAckerman, OM Melnik</i>
14:30 – 14:50	EN4: Investigation of Pilot-Ignited Dual-Fuel Natural Gas Combustion in an Optically Accessible Engine <i>J Rochussen, J Yeo, M Khosravi, P Kirchen</i>	FS4: Assessment of the Capabilities of FireFoam to Model Large Scale Fires in a Confined Compartment <i>D Le, CB Devaud, EJ Weckman, A Bounagui</i>
14:50 – 15:10	Break: Agriculture Atrium	
	AGRICULTURE 2E25	AGRICULTURE 1E85
	T6: Measurements and Diagnostics I Chair: M. Thomson	T7: Gas Turbines Chair: S. Dworkin
15:10 – 15:30	MD1: Thermal Stability and Controlled Oxidation of Aluminium Nanoparticles <i>J Wen, N Chaumeix, S Ory, G Matzen</i>	GT1: Blow-off Mechanism of Premixed Biogas Swirl-Flames Measured Using High-Repetition-Rate Laser Diagnostics <i>Q An, BD Geraedts, AM Steinberg</i>
15:30 – 15:50	MD2: Time-Resolved Multispectral Imaging of Combustion Reaction <i>A Huot, M-A Gagnon, K-A Jahjah, P Tremblay, S Savary, V Farley, P Lagueux, E Guyot, M Chamberland, F Marcotte</i>	GT2: Effect of Fuel Composition on the Stability Limits of a Low-Swirl Non-Premixed Biogas Flame <i>M Saediamiri, M Birouk, JA Kozinski</i>
15:50 – 16:10	MD3: Simulation of Beam Steering Inside a Turbulent Non-Premixed Flame <i>D Sawires, MR Johnson, G Hendra, WK Bushe</i>	GT3: An Evaluation of the EDC Model for a Premixed Jet Flame <i>S Jella, J Bergthorson, P Gauthier</i>
16:10 – 16:30	MD4: Sky-LOSA Measurement of Soot Yields of Gas Flares in Ecuador's Amazon Basin <i>BM Conrad, MR Johnson</i>	GT4: Effect of Centerline Jet Velocity on the Stability of a Low Swirl Non-Premixed Turbulent Biogas Flame <i>M Saediamiri, M Birouk, JA Kozinski</i>
	Optional Self-Guided Tour of Diefenbaker Canada Centre (on UofS campus, open until 20:00)	
	Dinner (on your own)	

WEDNESDAY, May 13, 2015

8:00 – 8:15	Welcome & Opening Remarks: Physics 103	
8:15 – 9:00	Plenary Lecture 2: Geological Storage of Carbon Dioxide: An Overview of Activities in Saskatchewan Prof. Chris Hawkes, University of Saskatchewan, Physics 103 Chair: T. Wiens	
	AGRICULTURE 2E25	AGRICULTURE 1E85
	W1: Laminar & Turbulent Flames Chair: P. Kirchen	W2: Biofuels Chair: D. Cree
9:20 – 9:40	LT1: Quantitative CH Measurements in Atmospheric-Pressure, Premixed Flames of C ₁ -C ₄ Alkanes <i>P Versailles, GMG Watson, ACA Lipardi, JM Bergthorson</i>	BF1: Measurement of Laminar Flame Speed of a Novel Liquid Biofuel <i>CA Gomez Casanova and M Birouk</i>
9:40 – 10:00	LT2: Flame Propagation in a Rectangular Duct Filled with Stratified Air and Fuel Mixtures <i>I Gallage, Z Mohavadi, A Sobiesiak</i>	BF2: Comparison of Cofired Wood-Derived Fast Pyrolysis Liquid and Natural Gas in a Swirl Burner <i>D Kowalewski, MJ Thomson, H Tran</i>
10:00 – 10:20	Break: Agriculture Atrium	
	AGRICULTURE 2E25	AGRICULTURE 1E85
	W3: Laminar & Turbulent Flames (cont) Chair: A. Steinberg	W4: Biofuels (cont) Chair: G. Ciccarelli
10:20 – 10:40	LT3: Periodicity in Corrugations of Weakly Turbulent Premixed Flames <i>S Kheirkhah, ÖL Gülder</i>	BF3: Effect of Iron Pentacarbonyl on Emission Profile from Counter-flow Ethanol Flame <i>A Raj, H Qi, J Wen, E Croiset</i>
10:40 – 11:00	LT4: Investigation of Structure and Species Concentration in Methane Inversed Diffusion Flames with Co-flow of Preheated Simulated Combustion Products <i>X Zhao, Z Movahedi, A Sobiesiak</i>	BF4: Particle Shape Effects in Packed Bed Combustion - II <i>E Trudel, W Hallett</i>

CICS Program Wednesday, May 13 (cont.)		
11:00 – 11:20	LT5: Transient Response of a Laminar Premixed Flame to a Radially Diverging/Converging Flow <i>M Sahafzadeh, LW Kostiuk, SB Dworkin</i>	BF5: Effect of Ambient Pressure and Temperature on the Vaporization Process of a Novel Liquid Biofuel <i>AMI Chowdhury, M Birouk, D Levin, E Othen, J Sorensen</i>
11:20 – 11:40	LT6: Effects of Lean Premixing and EGR Dilution on Laminar Flame Speed and NO _x Emissions of Premixed CH ₄ /Air Mixture <i>H Guo</i>	BF6: Combustion of Waste Chicken Eggshells as a Novel Limestone Filler in Polymers <i>D Cree</i>
11:40 – 13:30	Lunch: Marquis Culinary Centre	
	AGRICULTURE 2E25	AGRICULTURE 1E85
	W5: Measurements and Diagnostics II Chair: A. Sobiesiak	W6: Sprays and Droplets Chair: M. Johnson
13:30 – 13:50	MD5: Evaluation of Fast RBF Acoustic Tomography Measurement of Flame Temperature and Velocity Field <i>T Wiens</i>	SD1: Ignition of Single Droplets of n-alkyl Aromatic Mixtures: Experiments and a Model Based on Continuous Thermodynamics <i>C Boteler, W Hallett</i>
13:50 – 14:10	MD6: Three-Dimensional Rayleigh Index Measurements Using Doubly Phase-Conditioned Chemiluminescence Tomography for Swirl Flames with Helical Precessing Vortex Cores <i>B Geraedts, AM Steinberg, C Arndt</i>	SD2: Trajectory of a Liquid Spray in a High Temperature and Pressure Crossflow: Considering Mass Shedding in the Shear Breakup Mode <i>M Broumand, M Birouk</i>
14:10 – 14:30	MD7: Development of an Open-Path Hydrocarbon Detector and Proposed Tomographic Mass Flux Estimation <i>RW Tsang, SJ Grauer, KJ Daun</i>	SD3: Modeling the Vaporization Process of Flashing Spray for Combustion Applications <i>S Asenbauer, G Lamanna, MM Salehi, WK Bushe</i>
14:30 – 14:50	MD8: Measuring Iron Oxide Emissions Using a Long Range Optical Sensor <i>S Arnold, MJ Thomson, Z Wang</i>	SD4: Experimental Examination of Injected Salt Water and Hydrochloric Acid Solutions on the Carbon Conversion and Emissions of Turbulent Non-Premixed Flames <i>AM Jefferson, DJ Corbin, MR Johnson, A Vali, LW Kostiuk</i>
14:50 – 15:10	Break: Agriculture Atrium	

CICS Program Wednesday, May 13 (cont.)		
	AGRICULTURE 2E25	AGRICULTURE 1E85
	W7: Fire Science II Chair: C. Devaud	W8: Engines II Chair: K. Bushe
15:10 – 15:30	FS5: Experimental Evaluation of Damage and Thermal Penetration in Residential Walls under Realistic Fire Loads <i>MJ DiDomizio, EJ Weckman, R Roos</i>	EN5: Performance of a Dual-Fuel Port Injection CI Engine at Part Load <i>A House, G Ciccarelli, D McCann</i>
15:30 – 15:50	FS6: The Effects of Fire Retardant Additives on Flax Fiber Bio-Resin Composites at Elevated Temperatures <i>R Budd, D Cree</i>	EN6: Ignition Delay, Heat Release Profile, and Emission Correlation in Diesel Low Temperature Combustion <i>G Bryden, P Divekar, Z Yang, M Zheng</i>
15:50 – 16:10	FS7: Investigation of Behaviour of Stone Wool Insulation in a Tube Furnace at Various Temperatures <i>N Nagy, M DiDomizio, EJ Weckman</i>	EN7: Characterizing Emulsified Biodiesel - Fast Pyrolysis Oil for Combustion and Emissions Testing in a Single Cylinder Engine <i>J Laesecke, N Ellis, P Kirchen</i>
16:30 – 17:30	Annual Business Meeting of the Canadian Section, Agriculture 2E25	
17:45	Buses Leave for Banquet – Pickup in Front of Agriculture Building	
18:00 – 22:00	Banquet: Top of the Inn, Sheraton Cavalier, 612 Spadina Cr. East (Downtown)	

THURSDAY, May 14, 2015

	AGRICULTURE 2E25
	R1: Measurements and Diagnostics III Chair: E. Weckman
8:00 – 8:20	MD9: Influence of Flame Configuration on Turbulent Burning Velocity <i>S Kheirkhah, ÖL Gülder</i>
8:20 – 8:40	MD10: Simultaneous High Repetition-Rate OH/CH ₂ O-PLIF and T-PIV in Highly Turbulent Premixed Jet Flames <i>JR Osborne, AM Steinberg, CD Carter, S Peltier, S Hammack, T Lee</i>
8:40 – 9:00	MD11: Measurement of Local Flame Consumption Speeds in Highly Turbulent Premixed Flames Using High-Speed T-PIV and OH/CH ₂ O PLIF <i>SA Ramji, JR Osborne, AM Steinberg, CD Carter</i>
9:10 – 10:00	Plenary Lecture 3: Minerals, Metals and Materials: Understanding The World Around Us Dr. Jeff Cutler, Canadian Light Source Synchrotron, Agriculture 2E25 Chair: D. Cree
10:00 – 10:30	Break: Agriculture Atrium
10:30 - Noon	Optional Tour of Canadian Light Source Synchrotron (advance registration required)

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