

Program Schedule

Monday May 9, 2016

15:30 – 17:00	Informal CICS Board Meeting (E5 3006)
17:00 – 20:00	Registration and Reception (University Club)

Tuesday May 10, 2016

7:30 – 8:00	On-site Registration (DC 1301)	
8:00 – 8:10	Welcome and Opening Remarks (DC 1302)	
8:10 – 9:00	Plenary Lecture 1 (DC 1302): Detonations and industrial explosions Prof. Gabriel Ciccarelli, Department of Mechanical & Materials Engineering Queen's University Chair: E. Weckman	
	DC 1302	DC 1304
	Gas Turbine Chair: G. Bourque	Detonation & Deflagration Chair: M. Radulescu
9:10 – 9:30	Rayleigh gain dynamics during thermoacoustic oscillations of an aeronautical gas turbine combustor <i>S. Kheirkhah, P. Saini, J.D.M. Cirtwill, W.S. Richards, K. Venkatesan, A. Wickersham and A.M. Steinberg</i>	Propagation of gaseous detonation waves in a spatially heterogeneous reactive medium <i>X.C. Mi, A.J. Higgins, H.D. Ng, C.B. Kiyanda and N. Nikiforakis</i>
9:30 – 9:50	Thermal stability assessment of conventional and alternative aviation jet fuels <i>N.G. Young, F.T.C. Yuen, J.J. Liang and Ö.L. Gülder</i>	A quantitative study on the influence of cellular structure on the dynamics of detonations with constant mass divergence <i>B. Borzou and M.I. Radulescu</i>
9:50 – 10:10	Aerodynamics of a multi-nozzle swirl stabilized combustor <i>W.Y. Kwong, Q. An and A. Steinberg</i>	Discontinuous detonation propagation of stoichiometric hydrogen-oxygen mixtures in a partially obstructed square channel <i>M. Kellenberger and G. Ciccarelli</i>
10:10 – 10:30	Velocity and soot concentration fields of swirl-stabilized turbulent non-premixed propane/air flames <i>S. Chatterjee and Ö.L. Gülder</i>	Influence of turbulent fluctuations on the structure of irregular detonation propagation <i>B. Maxwell, R. Bhattacharjee, S. Lau-Chapdelaine, S. Falle, G. Sharpe and M. Radulescu</i>
10:30 – 10:50	Coffee Break (DC 1301)	

	Laminar & Turbulent Flames Chair: M. Thomson	Engine Chair: J. Wallace
10:50 – 11:10	Effect of burner geometry on the stability of partially premixed swirling methane flame <i>M.M. Abdel-Azim and M. Birouk</i>	Numerical study of the performance and emissions characteristics of natural gas/diesel dual-fuel engine using direct and indirect injection systems <i>A. Yousefi and M. Birouk</i>
11:10 – 11:30	The effect of partial-grid turbulence on the blowout velocity of a candle <i>A. Ahmed, H. Wu, F. Fouladi and D.S-K. Ting</i>	A preliminary investigation on the ignition characteristics of a three-pole spark plug under lean and CO₂ diluted conditions <i>C. Aversa, Z. Yang, Q. Tan, X. Yu, S. Yu and M. Zheng</i>
11:30 – 11:50	An investigation on the effect of positive and negative stretch in the structure of laminar premixed flame <i>M. Sahafzadeh, L.W. Kostiuik and S.B. Dworkin</i>	The effect of EGR on combustion and emissions of a natural gas-diesel dual fuel engine <i>H. Guo, W.S. Neill and B. Liko</i>
11:50 – 12:10	Measurements of flame surface area ratio in premixed turbulent methane/air Bunsen flames <i>P. Tamadonfar and Ö.L. Gülder</i>	Application of an in-cylinder local infrared absorption fuel concentration sensor in a diesel-ignited dual-fuel engine <i>J. Yeo, J. Rochussen, M. Khosravi and P. Kirchen</i>
12:10 – 12:30	Propagation and quenching of dual aluminum-methane/air flames <i>J. Palecka, S. Goroshin, J. Bergthorson and D. Frost</i>	Post injection strategies for increased power output of neat n-butanol combustion in a compression ignition engine <i>M. Jeftić, T. Gao and M. Zheng</i>
12:30 – 14:00	Lunch (Fed Hall: Main Hall) Board of Directors Meeting (Fed Hall: Westmount Room)	
	Measurement & Diagnostics Chair: M. Johnson	Biofuel Chair: Ö. Gülder
14:00- 14:20	Trajectory and breakup of cryogenic jets in crossflow <i>W. Richard and A. Steinberg</i>	Multi-event combustion of neat n-butanol application on a modern common-rail diesel engine <i>X. Han, P. Divekar, J. Tjong and M. Zheng</i>
14:20 – 14:40	Particle sphericity and pressure loss in packed bed combustion <i>E. Trudel, M. Busigin and W. Hallett</i>	The development of a new experimental facility for pyrolysis liquid biofuel (bio-oil) combustion <i>S. Zadmajid, Y. Afarin and M.J. Thomson</i>
14:40 – 15:00	Thermo-diffusive instabilities in flames propagating through aluminum dust clouds <i>J. Vickery, P. Julien, S. Goroshin, J.M. Bergthorson and D.L. Frost</i>	Numerical simulations of isothermal and reacting flow in a small lab-scale biomass furnace <i>M. Farokhi and M. Birouk</i>

15:00-15:20	<p>High-speed infrared imaging for analysis of a diesel engine supplied with a premixed methane-air charge <i>M.-A. Gagnon, P. Tremblay, S. Savary, V. Farley, E. Mancaruso and L. Sequino</i></p>	<p>Structural effects of biodiesel on soot formation in a laminar coflow diffusion flame <i>M.R. Kholghy, J. Weingarten, A.D. Sediako, M.J. Thomson, J. Barba and M. Lapuerta</i></p>
15:20 – 15:40	Coffee Break (DC 1301)	
	<p>Soot & Particulate Chair: L. Kostiuk</p>	<p>Detonation & Deflagration Chair: G. Ciccarelli</p>
15:40 – 16:00	<p>Assessing relative contributions of PAHs to soot mass by reversible heterogeneous nucleation and condensation <i>N.A. Eaves, S.B. Dworkin and M.J. Thomson</i></p>	<p>Gas dynamic model for CJ deflagrations in a detonation transmission problem <i>W. Wang and M.I. Radulescu</i></p>
16:00 – 16:20	<p>Sensitivity of primary soot particle size to combustion pressure in laminar methane-air diffusion flames <i>A.M. Vargas and Ö.L. Gülder</i></p>	<p>Chapman-Jouguet deflagrations and their transition to detonation <i>M. Saif, A. Pekalski and M.I. Radulescu</i></p>
16:20 – 16:40	<p>Development of a soot particle concentration estimator using Lagrangian post-processing for industrial combustion applications <i>R. Alexander and S.B. Dworkin</i></p>	<p>Thermal ignition revisited with molecular dynamics: role of fluctuations in activated collisions <i>N. Sirmas and M.I. Radulescu</i></p>

Wednesday May 11, 2016

8:00 – 8:10	Announcements (DC 1302)	
8:10 – 9:00	<p>Plenary Lecture 2 (DC 1302): Large-eddy simulation of in-cylinder processes in spark-ignition engines: cycle-to-cycle variations in flow and combustion Prof. Dan Haworth, Department of Mechanical & Nuclear Engineering The Pennsylvania State University Chair: C. Devaud</p>	
	DC 1302	DC 1304
	Measurement & Diagnostics Chair: J. Bergthorson	Soot & Particulate Chair: W. Hallett
9:10 – 9:30	<p>Probe sampling to map and characterize nanoparticles along the axis of a laminar methane jet diffusion flame <i>M. Kazemimanesh, A. Moallemi, J.S. Olfert and L.W. Kostiuik</i></p>	<p>Soot yield measurements of associated gas flares in Ecuador's Amazon basin using Sky-LOSA <i>B.M. Conrad, D.J. Corbin, A.M. Jefferson and M.R. Johnson</i></p>
9:30 – 9:50	<p>Development, calibration, and testing of a tomographic open-path hydrocarbon detection system <i>R.W. Tsang, S.J. Grauer and K.J. Daun</i></p>	<p>Effects of n-propylbenzene addition on soot formation and aggregate structure in an n-dodecane laminar coflow diffusion flame <i>T. Zhang, L. Zhao and M.J. Thomson</i></p>
9:50 – 10:10	<p>Experimental investigation of the effect of droplet initial diameter on fuel evaporation <i>C. Verwey and M. Birouk</i></p>	<p>Detailed modelling of CO₂ addition effects on the evolution of particle size distribution functions in a premixed ethylene flame <i>A. Naseri, A. Veshkini and M.J. Thomson</i></p>
10:10 – 10:30	<p>Layer by layer nano-energetic composites fabricated via electrophoretic deposition <i>H. Sui, S. Atashin and J.Z. Wen</i></p>	
10:30 – 10:50	Coffee Break (DC 1301)	
	Engine Chair: P. Kirchen	Laminar & Turbulent Flames Chair: C. Groth
10:50 – 11:10	<p>Combustion rates of a split-cycle engine fuelled with methane <i>I. Cameron and A. Sobiesiak</i></p>	<p>LES of a turbulent premixed flame with Conditional Source-Term Estimation and LEM presumed PDF and SDR models <i>H.P. Tsui, M.M. Salehi and W.K. Bushe</i></p>
11:10 – 11:30	<p>Shock-tube combustion of di-methyl ether under proto-typical diesel engine conditions <i>G. Rainsford, F.S. Carvalho and G. Ciccarelli</i></p>	<p>Predictions of emissions in the IFRF furnace using a presumed PDF combustion model <i>J.W. Labahn and C.B. Devaud</i></p>
11:30 – 11:50	<p>Preliminary investigation of intake swirl motion in a compression ignition engine <i>M. Ives, S. Dev and M. Zheng</i></p>	<p>Large Eddy Simulation of Sandia Flames D and F using Conditional Source-term Estimation and OpenFOAM <i>G. Hendra and W.K. Bushe</i></p>

11:50 – 12:10	An investigation of dual-fuel engine at low load: Effect of natural gas energy fraction and injection timing <i>A. Yousefi and M. Birouk</i>	Numerical investigation of Doubly Conditional Source-term Estimation applied to turbulent partially premixed combustion <i>M. Mortada and C.B. Devaud</i>
12:10 – 12:30	Evaluation of an Eulerian-based quasi-multiphase model for predicting spray atomization processes <i>T.F. Leung, C.P.T. Groth and J.T.C. Hu</i>	Pseudo-phase change in transcritical combustion for liquid rocket engines <i>J.-P. Hickey, P.C. Ma, D. Banuti and M. Ihme</i>
12:30 – 14:00	Lunch (Fed Hall: Main Hall)	
	Measurement & Diagnostics Chair: D. Torvi	Gas turbine Chair: W.K. Bushe
14:00- 14:20	Burning velocity measurements in aluminum suspensions <i>P. Julien, S. Whiteley, S. Goroshin, D. Frost and J. Bergthorson</i>	Stereoscopic-PIV and two-color LII measurements in swirl-stabilized non-premixed turbulent flames <i>L.-Y. Wang and Ö.L. Gülder</i>
14:20 – 14:40	Roles of diffusion mechanism during oxidation of aluminum micro/nanoparticles <i>F. Saceleanu, S. Atashin and J.Z. Wen</i>	Re-triggering of thermoacoustic oscillations in an aeronautical gas turbine combustor <i>S. Kheirkhah, P. Saini, J.D.M. Cirtwill, W.S. Richards, K. Venkatesan and A.M. Steinberg</i>
14:40 – 15:00	Bayesian analyses of nuisance parameters in auto-correlated laser induced incandescence <i>P.J. Hadwin, T.A. Sipkens, K.J. Daun, K.A. Thomson and F. Liu</i>	A comparison of reactor models for LES of turbulent flames <i>S. Jella, J. Bergthorson, P. Gauthier and G. Bourque</i>
15:00-15:20	NO_x sensor ammonia cross sensitivity analysis using a simplified physics based model <i>M. Aliramezani, K. Ebrahimi, C.R. Koch and R.E. Hayes</i>	The application of Gappy-POD as a data reconstruction technique for PIV measurements in gas turbine combustors <i>P. Saini, A. Steinberg and C. Arndt</i>
15:20 – 15:40	Coffee Break (DC 1301)	
	Soot & Particulate Chair: N. Eaves	Biofuel Chair: A. Steinberg
15:40 – 16:00	Measuring soot volume fraction, soot primary particle size and flame temperatures of a high molecular weight hydrocarbon flame using the laser-induced incandescence, spectral soot emission, laser extinction, and laser scattering techniques <i>C.N. Chu, L. Zhao, T. Zhang and M.J. Thomson</i>	An assessment on hydrogen production from pinewood through subcritical, near-critical and supercritical water gasification <i>S. Nanda, M. Casalino, M.S. Loungia and J.A. Kozinski</i>

16:00 – 16:20	Fast Exhaust Nephelometer (FEN): a new instrument for measuring cycle-resolved engine particulate emission <i>P. Kheirkhah, P. Kirchen and S.N. Rogak</i>	A corrosion study of crude and dewatered wood derived pyrolysis liquid biofuels on pintle nozzle injector components <i>V.C. Sookrah, M. Khan, M. Rafiq and M.J. Thomson</i>
16:20 – 16:40	Real-time observation of soot aggregate oxidation in an environmental transmission electron microscope <i>A.D. Sediako, M.R. Kholghy, M.J. Thomson, C. Soong and J.Y. Howe</i>	Generation of hydrothermal flames through supercritical water oxidation of <i>n</i>-propanol and methanol blended fuel <i>S. Nanda, S.N. Reddy, J.A. Kozinski, M.C. Hicks and U.G. Hegde</i>
17:00 – 18:00	Annual Business Meeting of the Canadian Section (DC 1302)	
18:30 – 21:00	Banquet (Fed Hall: Main Hall)	

Thursday May 12, 2016

8:00 – 8:10	Announcements (DC 1302)	
8:10 – 9:00	Plenary Lecture 3 (DC 1302): Demystifying fire pattern recognition using modern fire investigation tools Peter Senez, Executive Vice President - Canadian Operations, Jensen Hughes Chair: E. Weckman	
	DC 1302	DC 1304
	Fire Science Chair: J. Labahn	
9:10 – 9:30	Evaluation of ceiling temperatures predicted using furniture calorimeter fire test data <i>M. Fulton, D.A. Torvi and E.J. Weckman</i>	
9:30 – 9:50	Characterization of the gas environment in a smoke density chamber using electrochemical gas sensors <i>M.J. DiDomizio, E.J. Weckman and N.L. Ryder</i>	
9:50 – 10:10	Assessment of the thermal properties of insulation materials <i>N. Nagy, M.J. DiDomizio and E.J. Weckman</i>	
10:10 – 10:30	Front roughening of a flame in a discrete source system <i>F. Lam, C. Wagner, X.C. Mi, S. Goroshin and A.J. Higgins</i>	
10:30 – 10:50	Coffee Break (DC 1301)	
	Engine Chair: A. Sobiesak	Laminar & Turbulent Flames Chair: J-P. Hickey
10:50 – 11:10	Characterization of diesel-ignited dual-fuel combustion in an optical engine – Part I: Effects of fueling parameters on flame structure <i>M. Khosravi, J. Rochussen, J. Yeo and P. Kirchen</i>	Transverse acceleration effect on the rich blowout limit of diffusion flames <i>M.-A. Beaudoin, A. Landry-Blais, J.-S. Plante, M. Brouillette and M. Picard</i>
11:10 – 11:30	Characterization of diesel-ignited dual-fuel combustion in an optical engine – Part II: Optical and thermodynamic comparison <i>J. Rochussen, M. Khosravi, J. Yeo and P. Kirchen</i>	Reaction rate and flame structure relation in turbulent premixed flames measured from simultaneous 10 kHz TPIV, OH PLIF, and CH₂O PLIF <i>J.R. Osborne, A.M. Steinberg and C.D. Carter</i>
11:30 – 11:50	Exhaust pressure wave and gas flow characteristics in a single cylinder engine system <i>Z. Yang, S. Dev, G. Bryden, M. Zheng and D.S-K. Ting</i>	The effect of stratification on the 1st inversion of a premixed flame propagating in a rectangular duct <i>I. Gallage, Z. Mohavadi and A. Sobiesiak</i>

11:50 – 12:10	Mobile toxics human health risk assessment framework <i>M. Munshed, J. The and R. Fraser</i>	Emissions of nitrogen oxides from turbulent non-premixed flames: a comparison to current emission factors and scaling laws <i>A.M. Jefferson, D.J. Corbin and M.R. Johnson</i>
12:10 – 12:30		Impact of iron precursor injection modes on emission reduction in counter-flow methane diffusion flame <i>A. Raj, J.Z. Wen and E. Croiset</i>

13:30	Tour of the Fire Lab (Meet in front of DC 1301)	
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