

2008 Combustion Institute Canadian Section Spring Technical Meeting

Overall Program at a Glance

SUNDAY, May 11, 2008

14:00 – 17:00	Board of Directors Meeting (Board members only) – Mechanical Engineering Building, Room MC331
17:00 – 20:00	Registration and Reception – Hart House – East Common Room

MONDAY, May 12, 2008

8:30 – 9:00	Registration – Pharmacy Building, Lobby Outside Room B250	
8:45 – 9:00	Opening Welcome – Pharmacy Building Room B250	
9:00 – 9:40	Invited Lecture 1 – Pharmacy Building Room B250	
9:50 – 10:30	SESSION A: Diagnostics - Pharmacy B250	SESSION B: Detonations & Explosions – Pharmacy 250 (Pod)
10:30 – 10:50	BREAK	
10:50 – 12:10	SESSION A: Diagnostics - Pharmacy B250	SESSION B: Detonations & Explosions – Pharmacy 250 (Pod)
12:10 – 14:00	LUNCH & Board of Directors Meeting	
14:00 – 15:20	SESSION C: Laminar Diffusion Flames and Soot - Pharmacy B250	SESSION D: Engines I – Pharmacy 250 (Pod)
15:20 – 15:40	BREAK	
15:40 – 16:20	SESSION C: Laminar Diffusion Flames and Soot – Pharmacy B250	
16:20 – 16:40	Annual Business Meeting of the Canadian Section – Pharmacy B250	

TUESDAY, May 13, 2008

9:00 – 9:40	Invited Lecture 2 – Pharmacy B250	
9:50 – 10:30	SESSION E: Turbulent Combustion: Modelling and Experiments I – Pharmacy B250	SESSION F: Engines II – Pharmacy 250 (Pod)
10:30 – 10:50	BREAK	
10:50 – 12:10	SESSION E: Turbulent Combustion: Modelling and Experiments I – Pharmacy B250	SESSION F: Engines II – Pharmacy 250 (Pod)
12:10 – 13:20	LUNCH	
14:00 – 15:20	SESSION G: Turbulent Combustion: Modelling and Experiments II – Pharmacy B250	

15:20 – 15:40	BREAK
15:40 – 16:00	SESSION G: Turbulent Combustion:Modelling and Experiments II – Pharmacy B250
18:30 – 22:00	Banquet – University of Toronto Faculty Club

WEDNESDAY, May 14, 2008

9:00 – 9:40	Invited Lecture 3 – Pharmacy B250
9:50 – 10:30	SESSION H: Fires, catalytic and supercritical combustion - Pharmacy B250
10:30 – 10:50	BREAK
10:50 – 11:50	SESSION H: Fires, catalytic and supercritical combustion - Pharmacy B250
11:50 – 12:00	Closing Remarks

TECHNICAL PROGRAM

MONDAY, May 12, 2008

9:00 – 9:40	INVITED LECTURE 1 – Pharmacy Building Room B250 <u>Gregory J. Smallwood</u> , National Research Council Canada Measurement of Combustion-Generated Nonvolatile Nanoparticles
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	SESSION A: Diagnostics Pharmacy Building Room B 250 Chair: A. Sobiesiak	SESSION B: Detonations & Explosions - Pharmacy Building Room 250 (Pod) Chair: W. Hallett
9:50 – 10:10	Measurement of molecular mixing in high-speed flows using fast chemistry <i>J.M. Bergthorson, A.M. Bonanos, M.B. Johnson & P.E. Dimotakis</i>	Detonation structure under chain-branching kinetics with small initiation rate <i>L. Bédard-Tremblay, J. Melguizo-Gavilanes & L. Bauwens</i>
10:10 – 10:30	Molecular dynamic simulation of thermal accommodation coefficient for LII experiments <i>K.J. Daun, F. Liu & G.J. Smallwood</i>	One-dimensional chemical kinetic calculations of oblique shock-induced combustion and detonation <i>J. Verreault, P. Batchelor & A.J. Higgins</i>
10:30 – 10:50	BREAK	
10:50 – 11:10	Relative CH concentrations in C ₁ -C ₃ hydrocarbon stagnation flames <i>J.M. Bergthorson, L.J. Benezech & P.E. Dimotakis</i>	Post detonation dispersal and ignition of aluminized explosives <i>K.P. Ruggirello & P.E. DesJardin</i>
11:10 – 11:30	One-dimensional spectral line-of-sight attenuation for soot optical property measurement <i>K.A. Thomson, M.R. Johnson, D.R. Snelling & G.J. Smallwood</i>	The effects of gap height above a layer of porous material on detonation initiation in a horizontal combustion channel <i>S. Hlouschko & G. Ciccarelli</i>
11:30 – 11:50	Measuring optical properties of cooled soot <i>A.R. Coderre, K.A. Thomson, D.R. Snelling & M.R. Johnson</i>	Investigation of the combustion phenomena in a horizontal channel partially filled with porous media <i>C. Johansen & G. Ciccarelli</i>
11:50 – 12:10	Measurement of transmissivity in outdoor soot plumes using sky-scattered solar radiation <i>C. Yang, K.A. Thomson & M.R. Johnson</i>	Minimum burning pressure of AN-based emulsions <i>C.M. Badeen, S. Goldthorp, R. Turcotte, & S.K. Chan</i>
12:10 – 14:00	LUNCH (Board of Directors Meeting)	

	SESSION C: Laminar Diffusion Flames and Soot – Pharmacy Bldg Room B250 Chair: E. Weckman	SESSION D: Engines I – Pharmacy Building Room 250 (Pod) Chair: K. Bushe
14:00 – 14:20	Parallel implicit adaptive mesh refinement algorithm for unsteady laminar flames <i>S.A. Northrup & C.P.T. Groth</i>	Modelling alternative liquid fuels with continuous thermodynamics <i>W. Hallett, S. Beauchamp-Kiss & N. Legault</i>
14:20 – 14:40	Numerical study on the effect of gravity on flame shape and radiation in laminar diffusion flames <i>M.R.J. Charest, C.P.T. Groth & Ö.L. Gülder</i>	Investigating gas/diesel interactions in a two phase injector using combustion characteristics from a direct injection natural gas engine <i>B.S. Brown & S. Rogak</i>
14:40 – 15:00	Effects of hydrogen and helium addition to fuel on soot formation in an axisymmetric laminar methane-air diffusion flame <i>F. Liu, G.J. Smallwood, F. Migliorini & G. Zizak</i>	Image-based analysis of partially stratified natural gas combustion in a constant volume bomb <i>A.Z. Mezo, M.H. Davy & R.L. Evans</i>
15:00 – 15:20	The effect of CO addition on soot formation in a laminar ethylene/air coflow diffusion flame <i>H. Guo, K.A. Thomson & G.J. Smallwood</i>	Validating the numerical model of passive check valves in a novel uniflow-scavenged two-stroke engine <i>P. Oliver & G. Ciccarelli</i>
15:20 – 15:40	BREAK	
15:40 – 16:00	Modelling of soot aggregate formation in a laminar ethylene/air coflow diffusion flame with detailed PAH chemistry and an advanced sectional aerosol dynamics model <i>Q. Zhang, H. Guo, F. Liu, G.J. Smallwood & M.J. Thomson</i>	
16:00 – 16:20	Soot surface growth obliteration and fragmentation modeling in a laminar ethylene diffusion flame <i>B.Y. Choi, Q. Zhang, H. Guo, F. Liu, G.J. Smallwood & M.J. Thomson</i>	
16:20 – 16:40	Annual Business Meeting of the Canadian Section – Pharmacy Building Room B250	

TUESDAY, May 13, 2008

9:00 – 9:40	<p>INVITED LECTURE 2: Pharmacy Building Room B250 <u>Clinton P. T. Groth</u>, UTIAS, University of Toronto Toward Terascale Numerical Combustion Modelling: Routine, Reliable, and Robust Large-Eddy Simulation for Practical Combustor Systems</p>
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	<p>SESSION E: Turbulent Combustion: Modelling and Experiments I – Pharmacy Building Room B250 Chair: P. DesJardin</p>	<p>SESSION F: Engines II – Pharmacy Building Room 250 (Pod) Chair: M. Johnson</p>
9:50 – 10:10	<p>Conditional source-term estimation as a chemical closure method for premixed turbulent reacting flow <i>B. Jin, R. Grout & W.K. Bushe</i></p>	<p>Evaluation of a spark discharge particulate matter sensor in a turbocharged diesel engine <i>D.P. Gardiner, W.D. Allan & M. LaViolette</i></p>
10:10 – 10:30	<p>LES of a Bunsen flame using the thickened flame model <i>F.E. Hernandez-Pérez, C.P.T. Groth & Ö.L. Gülder</i></p>	<p>Morphology and microstructure of diesel particulates <i>A. Soewono & S. Rogak</i></p>
10:30 – 10:50	BREAK	
10:50 – 11:10	<p>Large-eddy simulation of a premixed turbulent Bunsen flame using flame surface density model <i>W. Lin, C.P.T. Groth & Ö.L. Gülder</i></p>	<p>Experimental HCCI cyclic variations using camshaft phasing <i>A. Audet & C.R. Koch</i></p>
11:10 – 11:30	<p>Dilatation, flame strain and curvature in turbulent premixed flames using direct numerical simulation <i>N. Shahbazian & S. Tullis</i></p>	<p>A novel in-cylinder fuel reformation approach to control HCCI engine combustion on-set <i>G. Gnanam, D. Haggith, A. Sobiesiak & G. Reader</i></p>
11:30 – 11:50	<p>Flame surface density and curvature statistics in turbulent premixed combustion <i>F.T.C. Yuen & Ö.L. Gülder</i></p>	<p>HCCI engine cyclic variation characterization using both chaotic and statistical approach <i>A. Ghazimirsaid, M. Shahbakhti, A. Audet & C.R. Koch</i></p>
11:50 – 12:10	<p>Stabilization of co-annular premixed flames with and without swirl <i>G. Ballachey & M.R. Johnson</i></p>	<p>Preliminary analysis to improve the diesel EGR reformer efficiency with periodic flow reversal and supplemental water & fuel injections <i>M. Pournazeri, U. Asad, X. Han, M. Wang & M. Zheng</i></p>

12:10 – 13:20	LUNCH
	SESSION G: Turbulent Combustion: Modelling and Experiments II – Pharmacy Building Room B250 Chair: G. Ciccarelli
13:20 – 13:40	OH/CH ₂ O/3-pentanone PLIF applied to a stratified isooctane/air turbulent flame front <i>P.C. Vena, B. Deschamps, G.J. Smallwood & M.R. Johnson</i>
13:40 – 14:00	Hysteresis of inverse diffusion flames with co-flowing combustion products and variable discharge height <i>M.B. Johnson & A. Sobiesiak</i>
14:00 – 14:20	Autoignition of CH ₄ , CH ₄ /C ₂ H ₆ , CH ₄ /H ₂ , and CH ₄ /N ₂ mixtures using first order conditional moment closure <i>A. El Sayed, A. Milford & C.B. Devaud</i>
14:20 – 14:40	On the simulation of auto-igniting turbulent non-premixed methane jets <i>N. Wu, W.K. Bushe & M.H. Davy</i>
14:40 – 15:00	BREAK
15:00 – 15:20	Analysis of blowout limits of turbulent non-premixed jet flames using the premixed combustion theory <i>T. Leung & I. Wierzba</i>
15:20 – 15:40	Mixing rate of transient gaseous fuel jet with air in tumbling or swirling motion <i>N. Gharib & A. Sobiesiak</i>
15:40 – 16:00	Comparative study on the scalar variance and dissipation rate in URANS and LES <i>I.K. Ye, F.-S. Lien & E. Chui</i>
18:30 – 22:00	Banquet – University of Toronto Faculty Club

WEDNESDAY, May 14, 2008

9:00 – 9:40	INVITED LECTURE 3: Pharmacy Building Room B250 <u>Elizabeth J. Weckman</u> (University of Waterloo) and David A. Torvi (University of Saskatchewan) The Emerging Field of Fire Safety Engineering: Partnerships in Research and Education
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	SESSION H: Fires, catalytic and supercritical flames Pharmacy Building Room B250 Chair: G. Smallwood
9:50 – 10:10	New insights into upward flame spread using 2D direct numerical simulations <i>W. Xie & P.E. DesJardin</i>
10:10 – 10:30	Protective fabric temperatures during radiant exposures in cone calorimeter <i>A. Ghazy, D.A. Torvi & D.J. Bergstrom</i>
10:30 – 10:50	BREAK
10:50 – 11:10	Flammable plumes dynamics resulting from the convective dispersion of a fixed mass of a gaseous fuel into air, 3D versus 2D models comparison <i>S. Fardisi & G. A. Karim</i>
11:10 – 11:30	Modelling catalytic oxidation of lean mixtures of methane-air in a packed bed reactor <i>S.A. Shahamiri & I. Wierzba</i>
11:30 – 11:50	Naphthalene combustion in supercritical water flames <i>A. Sohby, R.I.L. Guthrie, J.S. Butler & J.A. Kozinski</i>
11:50 – 12:00	Closing Remarks