MONDAY, May 20, 2013

7:15: Continental Breakfast and Registration in Grand Ballroom Lobby

WELCOME 7:45 AM
Kokopelli Grand Ballroom

Christopher Shaddix, Western States Section Chair

Eric Eddings, University of Utah

James Sutherland, Local Host

PLENARY LECTURE: 8:15

Contributions to combustion chemistry research
Katharina Kohse-Höinghaus, Bielefeld University
Julia Koppmann, Andreas Brockhinke

Session Chair: Arnaud Trouvé

9:15	**BREAK**							
Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
	Reaction Kinetics *Chair:* *E G. Eddings*	**Coal/Biomass** *Chair:* *J. Lighty*	**IC Engines** *Chair:* *L. Pickett*	**Flames** *Chair:* *G. Watson*	**Turbulent Modeling** *Chair:* *J.H. Chen*	**Diagnostics** *Chair:* *Z. Zhang*	**Heterogeneous Combustion** *Chair:* *A.J. Marchese*	**Environment** *Chair:* *A. Marshall*
9:35	1A01: Shock tube and modeling study of the pyrolysis of dimethyl carbonate and its reaction with D-and O-atoms *S. Peukert,* *R. Sivaramakrishnan,* *J.V. Michael*	1B01: Pulverized coal char combustion rates in different diluent gases: The influence of gas diffusivity *C.R. Shaddix,* *C. Gonzalo-Tirado*	1C01: Soot & internal combustion and gas turbine engines *C.-H. Huang,* *R.L. Vander Wal*	1D01: Studies of premixed and non-premixed Hydrogen/O_2/N_2 flames *O. Park,* *H. Brubano,* *P.S. Veloo,* *F.N. Egolfopoulos*	1E01: Model-based imaging of infrared radiation intensity from a turbulent non-premixed jet flame and plume *B.A. Rankin,* *M. Ihme,* *J.P. Gore*	1F01: Uncertainties of soot measurement in counterflow flames using laser induced incandescence: Soot volume fraction, particle size, and number density *B.G. Sarnacki,* *H.K. Chelliah*	1G01: Computational modeling of the effects of support fibers on evaporation of fiber-supported droplets in reduced gravity *N. Ghata,* *B.D. Shaw*	1H01: Experimental and numerical evaluation of nitrous oxide in lean combustion of alternative fuels *A. Akbari,* *R. Hack,* *V. McDonell,* *S. Samuelsen*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
9:55	1A02: Ignition delay times of very-low-vapor-pressure biodiesel surrogates behind reflected shock waves *M.F. Campbell,* *D.F. Davidson,* *R.K. Hanson*	1B02: Droplet breakup of nano-dispersed coal-in-water colloidal fuels under intense radiation *J. Xu,* *L. Qiao*	1C02: Computational study of partial fuel stratification for HCCI engines using gasoline surrogate reduced mechanism *B. Wolk,* *J.-Y. Chen*	1D02: NTC-affected ignition of DME by heated counterflowing air *S. Deng,* *P. Zhao,* *D. Zhu,* *C.K. Law*	1E02: Analysis of flamelet leading point dynamics in an inhomogeneous flow *A. Amato,* *T. Lieuwen*	1F02: High-speed tomographic PIV and OH PLIF measurements in reactive flows *B. Coriton,* *A.M. Steinberg,* *J.H. Frank*	1G02: One-step combustion synthesis of carbon-coated nanoparticles using multiple-diffusion flames *N.K. Memon,* *M.A. Ismail,* *D.H. Anjum,* *S.H. Chung*	1H02: Chemical structure of incipiently sooting ethylene-nitrogen counterflow diffusion flames at high pressures *L. Figura,* *A. Gomez*
10:15	1A03: Shock tube measurements of the *tert*-butanol + OH reaction rate and the *tert*-C_4H_8OH radical β-scission branching ratio using isotopic labeling *I. Stranic,* *G.A. Pang,* *D.F. Davidson,* *R.K. Hanson,* *D.M. Golden,* *C.T. Bowman*	1B03: Pyrolysis and CO_2 gasification rates of petroleum coke at high heating rates and elevated pressure *A.D. Lewis,* *E.G. Fletcher,* *T.H. Fletcher*	1C03: Increasing the HCCI autoignition reactivity of gasoline using conventional ignition improvers *C. Ji,* *J. Dec,* *J. Dernotte,* *W. Cannella*	1D03: Angle-dependent light scattering measurements of silica aggregates in a stoichiometric methane/hexa-methydisiloxane/ air premixed flames *J.D. Herdman,* *H.B. Levinsky,* *A.V. Mokhov*	1E03: Massively-parallelized reciprocal monte-carlo ray tracing for radiative transfer coupled with turbulent LES combustion simulations *I. Hunsaker,* *J. Thornock,* *T. Harman,* *P.J. Smith*	1F03: UV absorption spectroscopy in optically dense fireballs using achromatic frequency doubling of a broadband modeless dye laser *M. Soo,* *N. Glumac*	1G03: Correlation of internal flow and spray breakup for a fuel injector used in ship engines *M. Linne,* *Z. Falgout,* *M. Rahm,* *Z. Wang,* *M. Paciaroni,* *S. Matlok,* *J. Hult*	1H03: Near-critical CO_2 flow for carbon capture and storage *F. Kazemifar,* *D.C. Kyritsis*
10:35	1A04: Experimental study of pollutants formation in laminar premixed flames of tetrahydrofuran family fuels *L.-S. Tran,* *P.-A. Glaude,* *F. Battin-Leclerc*	1B04: Pyrolysis and CO_2 gasification rates of biomass at high heating rate conditions *A.D. Lewis,* *E.G. Fletcher,* *T.H. Fletcher*	1C04: Effects of spent cooling and swirler angle on a 9-point swirl-venturi low-NO*x* combustion concept *Z.J. He,* *K.M. Tacina,* *C.-M. Lee,* *R.R. Tacina,* *P. Lee*	1D04: Experimental investigation of propane-air flame propagation in narrow circular ducts *T.A. Connelly,* *D.C. Kyritsis*	1E04: Rapid unsteady extinction of nonpremixed flames *J.C. Hewson*	1F04: Time-resolved 3D OH planar laser-induced fluorescence system for multiphase combustion *K.Y. Cho,* *A. Satija,* *T.L. Pourpoint,* *S.F. Son,* *R.P. Lucht*	1G04: Effect of droplet size on the burning characteristics of liquid fuels with suspensions of energetic nanoparticles *S. Tanvir,* *L. Qiao*	1H04: Quantification of the physical and optical properties of combustion-generated fractal aggregates *C.D. Litton,* *I.E. Perera*

10:55	**Break** **ART COMPETITION – Cabin I** Sponsored by the Central States Section Voting Instructions will be provided							
Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
	Reaction Kinetics *Chair:* *M. Mehl*	**Kinetics Modeling** *Chair:* *A. Jasper*	**IC Engines** *Chair:* *C. Ji*	**Flames** *Chair:* *G. Blanquart*	**Turbulent Modeling** *Chair:* *J. Hewson*	**Diagnostics** *Chair:* *B. Coriton*	**Heterogeneous Combustion** *Chair:* *E. Shafirovich*	**Environment** *Chair:* *N. Haugen*
11:15	1A05: High-pressure ignition kinetics of 2-methyl-2-butene behind reflected shock waves *O. Mathieu,* *E.L. Petersen*	1B05: Combustion kinetic mechanism development using multispecies time histories in shock-tube pyrolysis of 3-pentanone *E.E. Dames,* *K.-Y. Lam,* *D.F Davidson,* *R.K. Hanson*	1C05: Optical investigation of multiple injections for unburned hydrocarbon emissions reduction with low-temperature combustion in a heavy-duty diesel engine *J. O'Connor,* *M. Musculus*	1D05: Swirling and non-swirling diffusion flame velocity measurements in a model validation combuster *C.R. Bedick,* *N.T. Weiland,* *P.A. Strakey*	1E05: The shadow-position mixing model applied to non-premixed turbulent combustion *S.B. Pope*	1F05: Quantification and accuracy of a CMOS-based Raman/Rayleigh scattering imaging system for high-speed measurements in flames *K. Gabet,* *F. Fuest,* *J. Sutton*	1G05: Particle morphology and composition of ash from heavy fuel oil fired at atmospheric conditions with various spray injection pressures *D. Tovar,* *D. Ellis,* *R.-K. Vipperla,* *D.R. Tree*	1H05: Physical and chemical characteristics of Particulate Matter (PM_1) emitted from combustion of a bituminous coal in air and oxy-fuel environments *F. Kazanc,* *Y.A. Levendis*
11:35	1A06: Shock-tube measurements of ignition delay times for ammonia *O. Mathieu,* *E.L. Petersen*	1B06: The use of dynamic adaptive chemistry and tabulation in reactive flow simulations *Z. Ren,* *Y. Liu,* *C. Xu,* *T. Lu,* *G.M. Goldin*	1C06: Effects of small-scale turbulence on NO_x formation in premixed flame fronts *Z. Ren,* *H. Yang,* *T. Lu*	1D06: Flame index measurements to assess partially-premixed flame models *D.A. Rosenberg,* *P.M. Allison,* *J.F. Driscoll*	1E06: Evaluation of numerical turbulent combustion models using flame speed measurements from a recently developed fan-stirred explosion vessel *S. Ravi,* *A. Morones,* *E. Petersen*	1F06: Recent developments of thin-filament pyrometry *B. Ma,* *G. Wang,* *G. Magnotti,* *R.S. Barlow,* *M.B. Long*	1G06: High-speed imaging of transient diesel spray behavior during high–pressure injection of a multi-hole fuel injector *S.B. Morris,* *W.E. Eagle,* *M.S. Wooldridge*	1H06: Metal nanoparticles encapsulated in amorphous carbon and carbon/nanofibers formed in a canola methyl ester air-flame *H.O.T. Ware,* *J.F.C. Pugliese,* *W. Merchan-Merchan*

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11:55	1A07: Thermal decomposition of C3-C5 ethyl esters: CO, CO_2 and H_2O time-history measurements behind reflected shock waves *W. Ren, R.M. Spearrin, D.F. Davidson, R.K. Hanson*	1B07: An aromatics and cC_5H_{5-8} model with improved transport for flat flames, flow reactors and shock tubes *E. Nehrbass, H. Tang, R.G. Butler*	1C07: Sensitivity analysis of particle formation in a spark-ignition engine during premixed operation *M. Hageman, D. Rothamer*	1D07: An experimental facility for studying flame propagation at elevated pressures *G. Mittal, B. Parajuli, V.A. Davies*	1E07: Large-eddy simulation of a turbulent reacting jet in crossflow *W.L. Chan, M. Ihme*	1F07: High-repetition-rate imaging of atomic oxygen in flames *W.D. Kulatilaka, N. Jiang, S. Roy, J.R. Gord*	1G07: Study of laboratory-scale burning of composite solid propellant for novel methods of nanoparticle synthesis *T.W. Allen, A.R. Demko, M. Johnson, T. Sammet, E.L. Petersen, D.L. Reid, R. Draper, S. Seal*	1H07: PAH dimerization as the first step to soot particle inception *J. Lowe, P. Elvati, A. Violi*
12:15	1A08: Shock tube ignition measurements of 2,5 dimethylhexane *T. Javed, A.E. Elwardany, S.M. Sarathy, A. Farooq*	1B08: Skeletal mechanisms of *n*-butanol, methyl butanoate, and syngas using Alternate Species Elimination (ASE) *B. Akih-Kumgeh, J.M. Bergthorson*	1C08: Mass transport within cavity stabilized flows *D.R. Richardson, A.M. Briones, D.L. Blunck*	1D08: Sound generation from premixed flames excited by helical flow disturbances *V. Acharya, T. Lieuwen*	1E08: Soot formation in turbulent nonpremixed flames-comparison of ODT and DNS *D.O. Lignell, A.D. Lewis*	1F08: Simultaneous measurements of temperature and CO mole fraction in combustion environment using TDL near 2.3 µm *A. Sane, A. Satija, R.P. Lucht, J.P. Gore*	1G08: Sooting behaviors of *n*-butanol and *n*-dodecane blends *S. Ghiassi, J.S. Lighty*	1H08: Investigation into the mechanism of soot deposition from gaseous polycyclic aromatic hydocarbons *A. Barlett, G. Blanquart*
12:35	Box lunches will be provided so you can attend your section membership meeting Central States Section: Grand Ballroom I Eastern States Section: Grand Ballroom II Western States Section: Grand Ballroom III							

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	Reaction Kinetics *Chair:* *X. Yang*	**Kinetics Modeling** *Chair:* *C.F. Goldsmith*	**IC Engines** *Chair:* *D. Rothamer*	**Flames** *Chair:* *J. Bergthorson*	**Turbulent Modeling** *Chair:* *P. DesJardins*	**Diagnostics** *Chair:* *A. Agrawal*	**Heterogeneous Combustion** *Chair:* *S. Skeen*	**Environment** *Chair:* *S. McAllister*
1:40	1A09: A shock tube laser schlieren study of cyclopentane ring opening *C.J. Annesley,* *P.T. Lynch,* *D.C. Garon,* *R.S. Tranter*	1B09: Quantum mechanical effects from ring polymer molecular dynamics *Y.V. Suleymanov*	1C09: Modeling the transient structure of reacting diesel jets using large eddy simulation *M.M. Ameen,* *V. Magi,* *J. Abraham*	1D09: The effect of mixture fraction on edge flame propagation speed *H. Prahanphap,* *J. Piotrowicz,* *R.S. Boles,* *D. Matinyan,* *W. Li,* *P.D. Ronney*	1E09: Turbulence-affected Darrieus-Landau instability *D.M. Valiev,* *C.K. Law,* *J.H. Chen*	1F09: 2D methyl radical measurement in a methane/air flame at atmospheric pressure *Y. Wu,* *Z. Zhang*	1G09: Quantitative mixing measurements and stochastic variability of a vaporizing gasoline direct-injection spray *M. Blessinger,* *M. Meijer,* *L.M. Pickett,* *J. Manin,* *S. Skeen*	1H09: Height and phase mode images of soot using AFM *S. Lieb,* *H. Wang*
2:00	1A10: A shock tube laser schlieren study of methyl acetate dissociation *C.J. Annesley,* *C.F. Goldsmith,* *R. Sivaramakrishnan,* *R.S. Tranter*	1B10: Chemical kinetic uncertainty minimization through laminar flame speeds of mixtures of air with C_1-C_4-hydrocarbons *O. Park,* *P.S. Veloo,* *D.A. Sheen,* *F.N. Egolfopoulos,* *H. Wang*	1C10: Large eddy simulation of soot evolution in an aircraft combustor *M.E. Mueller,* *H. Pitsch*	1D10: Comparison of OH radical species in *n*-butanol and methane diffusion flames *C.M. Mitsingas,* *A. Paz-Garcia,* *D.C. Kyritsis*	1E10: An LES/PDF study of a turbulent lifted ethylene jet flame in a heated coflow *Y. Yang,* *S.B. Pope,* *J.H. Chen*	1F10: Al nanoparticles photo-ignition-induced lean propane/air premixed flames initiation and propagation *J.E. Abboud,* *X. Chong,* *Z. Zhang,* *N. Jiang,* *S. Roy,* *J.R. Gord*	1G10: Towards better combustion of lunar regolith with magnesium *A. Delgado,* *E. Shafirovich*	1H10: Effect of unsaturated bond on PAH and soot formation in *n*-heptane and 1-heptene partially premixed flames *X. Fu,* *X. Han,* *S.K. Aggarwal*

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2:20	1A11: Shock tube study of ethylamine pyrolysis and oxidation *S. Li,* *D.F. Davidson,* *R.K. Hanson,* *K. Moshammer,* *K. Kohse-Höinghaus*	1B11: Implications of detailed and global kinetics on the first-stage ignition delay in NTC-affected phenomena *P. Zhao,* *C.K. Law*	1C11: Comparison of different chemical kinetic models for biodiesel combustion *Z. Wang,* *W. Liu,* *S. Som,* *D.E. Longman*	1D11: Electric field effects on premixed methane-air flames in millimeter-scale channels *G. Noel,* *D. Murphy,* *C. Fernandez-Pello*	1E11: Assessment of rate-controlled constrained-equilibrium method for implementation of detailed kinetics in turbulent combustion simulations *F. Hadi,* *M. Janbozorgi,* *R. Sheikhi,* *H. Metghalchi*	1F11: High-speed, two-dimensional temperature imaging in turbulent non-premixed jet flames using planar Rayleigh scattering *T.A. McManus,* *J.A. Sutton*	1G11: Contributions of thermal and prompt NO_x chemistry on NO_x formation near igniting oxygenated liquid fuel droplets *T. Grumstrup,* *A.J. Marchese,* *F.L. Dryer,* *T. Farouk*	1H11: Mercury oxidation by halogens under air-fired and oxygen-fired conditions *I. Preciado,* *T. Young,* *G. Silcox*
2:40	1A12: High-pressure low-temperature ignition behavior of syngas mixtures *A.B. Mansfield,* *M.S. Wooldridge*	1B12: Chemical kinetic modeling of low pressure methylcyclohexane flames *W.J. Pitz,* *S.A. Skeen,* *M. Mehl,* *N. Hansen,* *E.J. Silke*	1C12: Ignition and flame development in mixing layers with applications to CI engines *Z. Wang,* *J. Abraham*	1D12: Thin filament pyrometry for temperature measurements in fuel hydrate flames and non-premixed water-laden methane-air flames *R.E. Padilla,* *M. Minniti,* *D. Jaimes,* *J. Garman,* *D. Dunn-Rankin,* *T.K. Pham*	1E12: Large eddy simulation of second-law efficiency losses in nonpremixed turbulent flames *M. Safari,* *M.R.H. Sheikhi*	1F12: Investigation of non-premixed opposed flow H_2/air laminar flames using Coherent Anti-Stokes Raman Scattering (CARS) *A. Satija,* *R.D. Singh,* *S.V. Naik,* *R.P. Lucht*	1G12: Combustion of activated aluminum with water *A.K. Narayana Swamy,* *E. Shafirovich*	1H12: Large eddy simulation of turbulent wall fires *N. Ren,* *Y. Wang,* *S. Vilfayeau,* *A. Trouvé*
3:00	**Break** **Women in Combustion Break held in Cabin I** ART COMPETITION Central States Section presents cash awards to the winner – Please participate and vote **<u>Dinner tonight is on your own.</u>**							

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	Reaction Kinetics *Chair:* *W. Pitz*	**Coal/Biomass** *Chair:* *A. Ratner*	**IC Engines** *Chair:* *M. Musculus*	**Flames** *Chair:* *D. Dunn-Rankin*	**Detonation** *Chair:* *J. Steciak*	**Diagnostics** *Chair:* *C. Parigger*	**Heterogeneous Combustion** *Chair:* *K. Seshadri*	**Fire** *Chair:* *F. Miller*
3:20	1A13: Low-temperature chemical kinetic and speciation studies of *n*-heptane *D.M.A. Karwat,* *S.W. Wagnon,* *M.S. Wooldridge,* *C.K. Westbrook*	1B13: Near field aerodynamic effects of pure O_2 injection in co-axial oxy-coal turbulent diffusion flames *D. Rezaei,* *E.G. Eddings,* *K.E. Kelly,* *J.O.L. Wendt*	1C13: Modeling lifted diesel jets: Insights into the correlation between flame lift-off height and soot formation *M. Yen,* *J. Abraham*	1D13: Self induced buoyant blow off in upward flame spread on thin solid fuels *M.C. Johnston,* *J.S. T'ien,* *D.E. Muff,* *S.L. Olson,* *P.V. Ferkul*	1E13: High-pressure combustion and deflagration-to-detonation transition in ethylene/nitrous oxide mixtures *P.B. Venkatesh,* *J. D'Entremont,* *S.E. Meyer,* *S.P.M. Bane,* *M.C. Grubelich*	1F13: Experimental and computational determinations of optical band gaps for PAH and soot in N_2-diluted, ethylene/air non-premixed flames *E.M. Adkins,* *J.A. Herdman,* *J.H. Miller*	1G13: The effects of nano-scale additives on the linear burning rate of nitromethane at high pressure *K.W. McCown, III,* *E.L. Petersen*	1H13: Critical conditions for water-based suppression of plastic pool fires *H. Li,* *A.S. Rangwala,* *J.L. Torero*
3:40	1A14: A high temperature mechanism for methylformate combustion *R. Sivaramakrishnan,* *N.J. Labbe,* *W. Liu,* *M.J. Davis*	1B14: Gas-phase measurements of a bituminous coal in a pressurized entrained-low gasifier *D.R. Wagner,* *K.J. Whitty*	1C14: Study of NO_x from different natural gas and hydrogen fuel compositions in combustion applications *A. Akbari,* *V. McDonell,* *S. Samuelsen*	1D14: An experimental and computational study on soot formation in a coflow jet flame under microgravity and normal gravity *B. Ma,* *S. Cao,* *D. Giassi,* *D.P. Stocker,* *F. Takahashi,* *B.A.V. Bennett,* *M.D. Smooke,* *M.B. Long*	1E14: Stage of quasi-steady propagation in premixed flame acceleration in narrow channels *D.M. Valiev,* *V. Bychkov,* *V. Akkerman,* *C.K. Law*	1F14: *In-situ* soft x-ray absorption spectroscopy of flames *J.H. Frank* *A. Shavorskiy,* *H. Bluhm,* *B. Coriton,* *D.L. Osborn*	1G14: Utilizing preferential vaporization to enhance the stability of spray combustion for high water content fuels *F. Yi,* *R.L. Axelbaum*	1H14: Numerical investigation of stationary shrub fire in crosswind *S. Padhi,* *A. Dahale,* *B. Shotorban,* *S. Mahalingam*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
4:00	1A15: Oxidation of 2,7-dimethyloctane and *n*-propylcyclo-hexane in the low to intermediate temperature regime with a pressurized flow reactor *F. Farid,* *J. Corrubia,* *N. Cernansky,* *D. Miller*	1B15: Kinetic rates of oxidation and gasification reactions of coal chars reacting in oxy-combustion environments *E.S. Hecht,* *J.S. Lighty,* *C.R. Shaddix*	1C15: Flashback and turbulent flame speed measurements in a hydrogen and methane fired low-swirl injector at elevated pressures and temperatures *D. Beerer,* *V. McDonell,* *P. Therkelsen,* *R. Cheng*	1D15: Role of soret diffusion in the ignition of hydrogen/air mixtures by a heated kernel *W. Liang,* *C.K. Law,* *Z. Chen*	1E15: Heat transfer effects in nano-aluminum combustion *D. Allen,* *H. Krier,* *N. Glumac*	1F15: TDLAS-based *in-situ* monitoring of syngas composition from a pressurized oxygen-blown, entrained-flow coal gasifier *R. Sur,* *K. Sun,* *J.B. Jeffries,* *R.K. Hanson,* *R.J. Pummill,* *K. Whitty*	1G15: The ignition and combustion study of nano-al and iodine pentoxide thermite *G. Jian,* *S. Chowdhury,* *J. Feng,* *M.R. Zachariah*	1H15: A burning rate emulator for study in microgravity *Y. Zhang,* *M.J. Bustamante,* *P.B. Sunderland,* *J.G. Quintiere,* *P. Ferkul*
4:20	1A16: Pyrolysis of furan in a microreactor *K.N. Urness,* *A. Golan,* *J.W. Daily,* *M.R. Nimlos,* *J.F. Stanton,* *M. Ahmed,* *G.B. Ellison*	1B16: Computational assessment of the effect of realistic intraparticle geometry on biomass heating rates and pyrolysis yields *R.W. Grout,* *K. Malhorta,* *P. Ciesielski,* *K. Gruchalla,* *B. Donohoe,* *M. Nimlos*	1C16: PDF-based simulations of in-cylinder combustion in a compression-ignition engine *V.R. Mohan,* *D.C. Haworth,* *J. Li*	1D16: Effects of surrogate jet-fuel composition on ignition and extinction in high temperature applications *R. Shan,* *T. Lu*	1E16: Fast flame acceleration and deflagration-to-detonation transition in smooth and obstructed tubes, channels and slits *V. Akkerman,* *V. Bychkov,* *M. Kuznetsov,* *C.K. Law,* *D. Valiev,* *M.-H. Wu*	1F16: Two-dimensional soot aggregate sizing by multi-angle light scattering *B. Ma,* *M.B. Long*	1G16: Burning behavior of energetic composite nonofibers *G. Jian,* *S. Yan,* *H. Wang,* *M.R. Zachariah*	1H16: Flame spread through arrays of wooden dowels *Z. Zhao,* *D. Gorham,* *M.J. Gollner*
4:40	1A17: Studies of pyrolysis and oxidation of methyl formate using molecular beam mass spectroscopy *N. Kurimoto,* *X. Yang,* *Y. Ju*	1B17: A novel approach for the development of global kinetic models for biomass gasification *K. Malhotra,* *P. Pepiot,* *M. Nimlos*	1C17: Impact of ethane, propane, and diluent content in natural gas on the NO_x emissions of a commercial microturbine generator *A. Colorado,* *V. McDonell*	1D17: Modeling ion and electron profiles in methane-oxygen counterflow diffusion flames *P.V. Shah,* *A.V. Saveliev*		1F17: Imaging measurements of soot temperature and volume fraction in flames *H. Guo,* *J.A. Castillo,* *P.B. Sunderland*	1G17: Isolated alkane droplet combustion in microgravity: "Cool Flames" *T. Farouk,* *F.L. Dryer*	1H17: Buoyant instabilities in steady and propagating flames *D. Gorham,* *M.A. Finney,* *S. McAllister,* *M.J. Gollner*

TUESDAY, May 21, 2013

7:15: Continental Breakfast and Registration in Grand Ballroom Lobby

PLENARY LECTURE: 8:15
Kokopelli Grand Ballroom

A Tribute to Adel F. Sarofim: Acknowledging His Contributions to Combustion Science

Reginald E. Mitchell (Stanford University) and Joseph J. Helble (Dartmouth College)

Session Chair: Jost O.L. Wendt

9:15	**BREAK**							
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	Reaction Kinetics *Chair:* *C. Annesley*	**Kinetics Modeling** *Chair:* *E. Petersen*	**IC Engines** *Chair:* *J. Abraham*	**Flames** *Chair:* *P. Veloo*	**Laminar/ Turbulent Modeling** *Chair:* *P. Pepiot*	**Laminar Flames** *Chair:* *M. Hirota*	**Heterogeneous Combustion** *Chair:* *T. Farouk*	**Fire** *Chair:* *L. Kostiuk*
9:35	2A01: High pressure studies of propene combustion *J. Santner,* *F.M. Haas,* *X. Shen,* *Y. Ju,* *F.L. Dryer*	2B01: A bifurcation analysis for limit flame phenomena *R. Shan,* *T. Lu*	2C01: Proper orthogonal decomposition analysis of 9-point swirl-venturi lean direct injection combustion technology *K.M. Tacina*	2D01: Premixed tulip shaped flames in a rectangular combustion chamber *A. Hariharan,* *I. Wichman*	2E01: A comparison between two different flamelet reduced order manifolds for non-premixed turbulent flames *H.A. El-Asrag,* *G. Goldin*	2F01: Rate-ration asymptotic analysis of the influence of addition of hydrogen on the structure and mechanisms of extinction on nonpremixed methane flame *K. Seshadri,* *X.-S. Bai,* *F.A. Williams*	2G01: Morphological control of metal oxide nanowire heterostructures synthesized by sol-flame method *R. Luo,* *I.-S. Cho,* *Y. Feng,* *L. Cai,* *P.M. Rao,* *X. Zheng*	2H01: Influence of C_2HF_5 and C_3HF_7 on CH_4 and C_3H_8 combustion: Flame speed and ignition delay time measurements *C.H. Osorio,* *A. Morones,* *D. Plichta,* *E.L. Petersen,* *S. Mannan*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
9:55	2A02: Experimental study of dimethoxy-methane and dimethyl carbonate addition to premixed ethane/oxygen/ argon flames *B.Yang, T.A. Cool, N. Hansen, K. Moshammer, K. Kohse-Höinghaus*	2B02: Multi-target global sensitivity analysis of *n*-butanol combustion *D.D.Y. Zhou, R.T. Skodje, W. Liu, M.J. Davis*	2C02: Light-duty drive cycle simulations of diesel engine-out exhaust properties for an RCCI-enabled vehicle *Z. Gao, S.J. Curran, C.S. Daw, R.M. Wagner*	2D02: Influence of burner material, tip temperature and fuel composition on flashback behavior of jet flames *Z. Duan, B. Shaffer, V. McDonell*	2E02: Investigation of ignition dynamics in a H_2/air mixing layer with an embedded vortex *S.K. Menon, G. Blanquart*	2F02: Behavior of preheated premixed flames at lean conditions *M. Ayoobi, I. Schoegl*	2G02: Flame structures of ammonium perchlorate composite propellants with various coarse-to-fine particle size ratios *S. Isert, T.D. Hedman, K.Y. Cho, R.P. Lucht, S.F. Son*	2H02: Application of One Dimensional Model (ODT) to model firespread through biomass fuel beds *A. Paudel, D.O. Lignell, R. Hintze, M. Finney*
10:15	2A03: Decomposition and combustion of mono-methylhydrazinium nitrates *S.Q. Wang, S.T. Thynell*	2B03: On the effects of diluent gas composition on autoignition *S.W. Wagnon, M.S. Wooldridge*	2C03: Using MD to calculate the diffusion coefficients of hydrocarbons *T. Dillstrom, P. Elvati, A. Violi*	2D03: Experimental diagnostics and modelling of jet-wall stagnation flames for NO_x sub-model validation *G.M.G. Watson, J.D. Munzar, J.M. Bergthorson*	2E03: A flamelet-based relaxation model for polycyclic aromatic hydrocarbons in turbulent flames *Y. Xuan, G. Blanquart*	2F03: The evolution of soot morphology in an atmospheric laminar coflow diffusion flame of a surrogate for jet A-1 *M. Kholghy, M. Saffaripour, C. Yip, M.J. Thomson*	2G03: Flammability aspects of fabric in opposed and concurrent air flow in microgravity *P.V. Ferkul, S.L. Olson, M.C. Johnston, J.S. T'ien*	2H03: Hydrocarbon pool fire behavior around vertical cylinders *X. Shi, A.S. Rangwala*
10:35	2A04: On the interpretation of experimental data from rapid compression machines *G. Mittal, M. Chomier*	2B04: Roaming radical kinetics in the pyrolysis and combustion of ethanol *A.G. Vandputte, L.B. Harding, Y. Georgievskii, S.J. Klippenstein*	2C04: A study of strut based flame holder combustion physics: Comparing JP-8, JP-7 and RP-2 fuels *Y.R. Hicks, J. Lee, R.J. Locke, S.A. Tedder, R.C. Anderson*	2D04: Evolution and morphology of globally-spherical and bubble-shaped accelerating deflagration fronts: Stability, dynamics and possibility of detonation triggering *V. Akkerman, S. Chaudhuri, C.K. Law*	2E04: Transverse fuel jet in turbulent cross-flow: Influence of fuel composition on near field flame stabilization *H. Kolla, R.W. Grout, A. Gruber, J.H. Chen*	2F04: Laminar flame speed, Markstein length and flame chemistry of the butanol isomers from 1 atm to 5 atm *F. Wu, C.K. Law*	2G04: Experimental characterization of 1-butanol electrospray combustion *M. Pennisi, D.C. Kyritsis*	2H04: Flame tower: A novel apparatus to study flame spread at low concurrent or opposed flow velocity *C. Paolini, S. Bhattacharjee, W. Tran, F. Naib, F. Miller*

10:55	**Break** Work-in-Progress Poster Presentations – Cabin I							
Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
	Reaction Kinetics *Chair:* *D. Karwat*	**Kinetics Modeling** *Chair:* *E. Papajak*	**IC Engines** *Chair:* *M. McNenly*	**Flames** *Chair:* *P. Sunderland*	**Laminar/ Turbulent Modeling** *Chair:* *H. El-Asrag*	**Laminar Flames** *Chair:* *N. Hansen*	**Heterogeneous Combustion** *Chair:* *M. Linne*	**Fire** *Chair:* *S. Bhattacharjee*
11:15	2A05: Oxidation kinetics and nanostructure of model carbons based on TGA data *I.C. Jaramillo, J. Levinthal, J.S. Lighty, C.K. Gaddam, R. Vander Wal*	2B05: Theoretical assessment on reaction kinetics HCO and CH_2OH unimolecular decomposition *X. Yang, T. Tan, P. Diévart, E.A. Carter, Y. Ju*	2C05: Autoignition characterization of primary reference fuels and *n*-heptane/*n*-butanol mixtures in a constant volume combustion device and homogeneous charge compression ignition engine *M.E. Baumgardner, A.J. Marchese, S.M. Sarathy*	2D05: An efficient and explicit pressure projection method for reacting flow simulations *A. Biglari, T. Saad, J.C. Sutherland*	2E05: A *priori* model for the effective Lewis numbers in premixed turbulent flames *B. Savard, G. Blanquart*	2F05: Characteristics of nonpremixed dimethyl ether flame stabilized in a co-flowing configuration *M. Hirota, K. Seshadri*	2G05: Solid propellant combustion enhancement using fluorocarbon inclusion modified aluminum *T.R. Sippel, S.F. Son, L.J. Groven*	2H05: Quantitative infrared imaging of impinging buoyant diffusion flames *A. S. Newale, B.A. Rankin, J.P. Gore*
11:35	2A06: Autoignition of ethanol in a rapid compression machine *G. Mittal, V.A. Davies, B. Parajuli*	2B06: Multi-scale informatics for low-temperature propane oxidation *M.P. Burke, C.F. Goldsmith, S.J. Klippenstein, I. Sheps, O. Welz, J. Zádor, H. Huang, C.A. Taatjes*	2C06: A surrogate for emulating the physical and chemical properties of jet fuel *D. Kim, J. Martz, A. Violi*	2D06: Direct numerical simulation of autoiginition of a hydrogen jet in a preheated cross flow *A. Abdilghanie, C.E. Frouzakis, P. Fischer*	2E06: Investigation of vortex-premixed flame interaction with detailed chemistry *B. Bobbitt, G. Blanquart*	2F06: Measurement of laminar burning speeds and investigation of flame stability of mixtures of H_2/CO with air over a wide range of mixing ratios at high temperatures and pressures *A. Moghaddas, O. Askari, E. Rokni, H. Metghalchi*	2G06: Experimental investigation of pressure effect on ignition delay of monomethyl-hydrazine, 1,1-dimethyl-hydrazine, tetramethylethyl-enediamine and 2-dimethyla-minoethylazide with nitric acid *S.Q. Wang, S.T. Thynell*	2H06: Impact of an oxidative pyrolysis model for charring wood in fire simulations *R. Acharya, M. Colket, P. Papas, J. Senecal*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
11:55	2A07: High temperature allyl recombination kinetics *P.T. Lynch,* *C.J. Annesley,* *A. Fridlyand,* *K. Brezinsky,* *R.S. Tranter*	2B07: A kinetic modeling study of high temperature chemistry of *n*-pentanol *Q. Li,* *S.S. Merchant,* *W.H. Green,* *Z. Huang*	2C07: High energy spark kernel evolution: Measurements and modeling *B. Sforzo,* *J. Kim,* *A. Lambert,* *J. Jagoda,* *S. Menon,* *J. Seitzman*	2D07: Effect of exhaust gas recirculation and combustible oxygen mass fraction on emission index of NO*x* for counterflow methane/air diffusion flames *M. Sane,* *S. Dasappa,* *G.M. Shaver,* *J.P. Gore*	2E07: An adaptive methodology for the efficient implementation of detailed chemistry in simulations of turbulent non-premixed combustion *Y. Liang,* *V. Hiremath,* *S.B. Pope,* *P. Pepiot*	2F07: Experimental investigations of the influence of pressure on critical conditions of extinction of laminar nonpremixed flames burning condensed hydrocarbon fuels *R. Gehmlich,* *K. Seshadri*	2G07: Synthesis of niobium pentoxide micro/nanorods in a counter-flow flame *M.F. Farahani,* *A.V. Saveliev,* *W. Merchan-Merchan*	2H07: Evaluation of low-gravity smoke particulate for spacecraft fire detection *D. Urban,* *G. Ruff,* *G. Mulholland,* *M. Meyer,* *Z.G. Yuan,* *T. Cleary,* *J. Yang,* *P. Greenberg,* *V. Bryg*
12:15	2A08: Quantification of molecular structure impact on combustion properties for synthetic diesel fuel: 2,6,10-trimethyldodecane *S.H. Won,* *S. Dooley,* *P.S. Veloo,* *H. Wang,* *M.A. Oehlschlaeger,* *F.L. Dryer,* *Y. Ju*	2B08: Kinetics study of reaction $CH_3N{\cdot}NH_2$+OH by multireference second-order perturbation theory and multireference coupled-cluster theory *H. Sun,* *C.K. Law,* *K. Kowalski,* *K. Bhaskaran-Nair*	2C08: Effect of hydrogen addition to methane fuel in a low swirl burner *K. Kaufman,* *M. Emadi,* *A. Ratner*	2D08: Impact of mixture fraction field curvature on chemical species transport in diffusion flames *Y. Xuan,* *G. Blanquart,* *M. Mueller*	2E08: Measurements of leading point conditioned statistics of high hydrogen content fuels *A. Marshall,* *P. Venkateswaran,* *J. Seitzman,* *T. Lieuwen*	2F08: Laminar flame speeds of natural gas blends with hydrogen at elevated pressures and temperatures *D. Plichta,* *O. Mathieu,* *E. Petersen,* *G. Bourque,* *H. Curran,* *S. Burke,* *W. Metcalfe,* *F. Güthe*	2G08: Combustion performance of mechanically activated silicon/polytetra-fluoroethylene *B.C. Terry,* *S.F. Son,* *L.J. Groven*	2H08: Quantifying radiation transport properties of fuel vapors for fire models *V.R. Lecoustre,* *G.S. Jackson*
12:35	**Lunch** (Box lunches will be available in the Ballroom Lobby) ***US National Board of Directors Meeting in Cabin Boardroom***							

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
	Reaction Kinetics *Chair:* *D. Sheen*	**Kinetics Modeling** *Chair:* *J. Zádor*	**IC Engines** *Chair:* *Z. Ren*	**Flames** *Chair:* *T.C. Lieuwen*	**Turbulent Experiments** *Chair:* *J. Frank*	**Laminar/Coal** *Chair:* *O. Mathieu*	**Heterogeneous Combusiton** *Chair:* *A. Saveliev*	**Fire** *Chair:* *C. Finney*
1:40	2A09: Kinetics of nascent soot oxidation in a flow reactor *J. Camacho,* *H. Wang*	2B09: Reduced mechanisms for gasoline surrogates valid at engine conditions *K.E. Niemeyer,* *C.-J. Sung*	2C09: Effect of jet composition in hot jet ignition of premixed mixture in a constant volume combustor *A. Karimi,* *P. Chinnathambi,* *M. Rajagopal,* *R. Nalim*	2D09: On combustion in a closed rectangular channel *R. Kiran,* *I. Wichman,* *N. Müller*	2E09: Pressure and fuel effects on the flame brush thickness of H_2/CO flames *P. Venkateswaran,* *A. Irby,* *A. Marshall,* *J. Seitzman,* *T. Lieuwen*	2F09: Laminar burning speed of *n*-hexane-air mixtures *S. Coronel,* *R. Mével,* *P. Vervish* *P.A. Boettcher,* *V. Thomas,* *N. Chaumeix,* *N. Darabiha,* *J.E. Shepherd*	2G09: Mechanically activated SHS compaction of $MoSi_2$-based composites *M.S. Alam,* *E. Shafirovich*	2H09: The decompostion behavior of thermoset carbon fiber epoxy composites in the fire environment *A.L. Brown*
2:00	2A10: Detailed investigation of soot nanostructure: Effect of pressure *P. Toth,* *A.B. Palotas,* *T.A. Ring,* *E.G. Eddings,* *R. Vander Wal,* *C.K. Gaddam,* *J. Levinthal,* *I.C. Jaramillo,* *J.S. Lighty*	2B10: The role of individual rate coefficients in the performance of compression ignition engine models *W. Liu,* *S. Som,* *D.D.Y. Zhou,* *R. Sivaramakrishnan,* *D.E. Longman,* *R.T. Skodje,* *M.J. Davis*	2C10: Extinction-based imaging of soot processes over a range of diesel operating conditions *S.A. Skeen,* *J. Manin,* *K. Dalen,* *L.M. Pickett*	2D10: Multi-timescale modeling of ignition and flame propagation of diesel surrogate fuel mixtures *W. Sun,* *H.A. El-Asrag,* *Y. Ju*	2E10: Influence of fuel type on advective heat flux and extinction scalar dissipation rate in negative edge flames *K.R. Gosselin,* *K.M. Kopp-Vaughan,* *M.W. Renfro*	2F10: Biomass/coal co-pyrolysis and co-combustion characterization *G. Liu,* *G. Agarwal,* *B. Lattimer,* *S. Ekkad*	2G10: Methanol droplet combustion in oxygen-inert environments in microgravity *V. Nayagam,* *D.L. Dietrich,* *M.C. Hicks,* *F.A. Williams*	2H10: Boundary layer effect on the correlation of spread rate data in opposed flow flame spread *S. Bhattacharjee,* *W. Tran,* *M. Laue,* *C. Paolini,* *Y. Nakamura*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
2:20	2A11: Low temperature oxidation of *n*-hexane in a flow reactor *R. Mével,* *K. Chatelain,* *P.A. Boettcher,* *J.E. Shepherd*	2B11: Application of a radical initiated, two-step global reaction model to six explosives *J.R. Peterson,* *C.A. Wight*	2C11: Combustion instability interaction with fuel-air mixing in a partially-premixed gas turbine model combustor *P.M. Allison,* *D.A. Rosenberg,* *J.F. Driscoll*	2D11: An adjoint approach to understanding perturbation of flames *K. Braman,* *T. Oliver,* *V. Raman*	2E11: Joint temperature-volume fraction statistics of soot in turbulent non-premixed jet flames *C.R. Shaddix,* *J. Zhang*	2F11: Numerical and experimental investigations into combustion of a single biomass particle *R. Lewtak,* *E. Marek*	2G11: Effect of varying the initial diameter of *n*-octane and *n*-decane droplets over a wide range on the spherically symmetric combustion process: International space station and ground-based experiments *Y.C. Liu,* *K.N. Trenou,* *J. Rah,* *M.C. Hicks,* *C.T. Avedisian*	2H11: Flame merging in two neighboring shrub fires *A. Dahale,* *S. Padhi,* *B. Shotorban,* *S. Mahalingam*
2:50	2A12: A comprehensive experimental and modeling study of iso-pentanol combustion *S.M. Sarathy,* *S. Park,* *W. Wang,* *P. Veloo,* *A.C. Davis,* *C. Togbe,* *B. Weber,* *C.K. Westbrook,* *O. Park,* *G. Dayma,* *Z. Luo,* *M.A. Oehlschlaeger,* *F. Egolfopoulos,* *T. Lu,* *W.J. Pitz,* *C.-J. Sung,* *P. Dagaut*	2B12: Calibration of the $CO + OH \rightarrow CO_2 + H$ rate constant with direct and indirect information *S. Plessis*	2C12: Experimental study of traversing hot-jet ignition of lean hydrocarbon-air mixtures in a constant-volume combustor *P. Chinnathambi,* *A. Karimi,* *M. Rajagopal,* *R. Nalim*	2D12: Direct numerical simulations of diffusion flame extinction at different pressures *V.R. Lecoustre,* *P.G. Arias,* *S. Roy,* *Z. Luo,* *D.C. Haworth,* *H.G. Im,* *T.F. Lu,* *A. Trouvé*	2E12: 1D Raman/Rayleigh/ CO-LIF line measurements of major and temperature in turbulent DME/air jet flame *F. Fuest,* *R.S. Barlow,* *G. Magnotti,* *J.A. Sutton*		2G12: High-speed visualization of two-phase flow inside a transparent fuel injector *S.R. Agrawal,* *L. Jiang,* *A.K. Agrawal,* *K.C. Midkiff*	2H12: Convective flow structures in the liquid phase of nominally quiescent pool fires *A. Vali,* *D.S. Nobes,* *L.K. Kostiuk*

3:10	**Break** **Visit Work-in-Progress Poster Presentations in Cabin I** **(Posters can be left up for the evening so they do not need to be carried to the banquet)**							
Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
	Reaction Kinetics *Chair:* *H. Sun*	**Kinetics Modeling** *Chair:* *R. Whitesides*	**Micro/IC Engines** *Chair:* *M. Mueller*	**Coal/Biomass** *Chair:* *E. Dames*	**Turbulent Experiments** *Chair:* *H. Kolla*	**Diagnostics** *Chair:* *N. Glumac*	**Heterogeneous Combustion** *Chair:* *L. Groven*	**Fire** *Chair:* *M. Gollner*
3:30	2A13: Experimental and modeling study of cycloalkanes oxidation *A. Comandini,* *T. Dubois,* *N. Chaumeix*	2B13: Source term parameterization for PCA combustion modeling *B. Isaac,* *A. Parente,* *J. Sutherland,* *P. Smith,* *G. Fru,* *D. Thevenin*	2C13: Towards accommodating comprehensive chemical reaction mechanisms in practical internal combustion engine simulations *M. Raju,* *M. Wang,* *M. Dai,* *S. Quan,* *P.K. Senecal,* *S. Som,* *M. McNenly,* *D.L. Flowers*	2D13: A comparison of various models in predicting ignition delay in single-particle coal combustion *B. Goshayeshi,* *J.C. Sutherland*	2E13: Measurement of flow field and tangential strain along the flame front in a turbulent partially premixed flames *I.A. Mulla,* *S.R. Chakravarthy*	2F13: Time-resolved particle image velocimetry of non-reacting flow in a swirl-stabilized combustor without and with foam inserts for acoustic control *J. Meadows,* *A.K. Agrawal*	2G13: Opposed flow flame synthesis of molybdenum oxide nanostructures *S. Srivastava,* *W. Merchan-Merchan,* *A.V. Saveliev,* *M. Desai*	2H13: A combined experimental and theoretical study of the combustion of live vs. dead leaves *D.R. Prince,* *T.H. Fletcher*
3:50	2A14: Kinetics of the reactions of H and CH_3 radicals and *n*butane: An experimental design study using reaction network analysis *D.A. Sheen,* *J.A. Manion*	2B14: Oxidation of phenanthrene radicals by OH *D.E. Edwards,* *D.Y. Zubarev,* *W.A. Lester, Jr.,* *M. Frenklach*	2C14: An electricity and value-added gases co-generation via solid oxide fuel cells *K. Wang,* *P. Zeng,* *R. Falkenstein-Smith,* *J. Ahn*	2D14: Transported PDF modeling of a pulverized coal flame *X.-Y. Zhao,* *D.C. Haworth*	2E14: Quanitative imaging of radiation intensity from a turbulent sooting flame *R.K. Kapaku,* *B.A. Rankin,* *J.P. Gore*	2F14: A robust method for the quantitative shadow imaging of dense reacting particulate flows *P. Toth,* *A.B. Palotas,* *T.A. Ring,* *E.G. Eddings*	2G14: Catalytic oxidation of alkanes over palladium oxide *Y.X. Xin,* *H. Wang,* *C.K. Law*	2H14: Fuel element combustion properties for live wildland Utah shrubs *C. Shen,* *T.H. Fletcher*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
4:10	2A15: Kinetics of the reactions of H and CH_3 radicals with *n*-butane: Shock-tube experiments and the establishment of relative and absolute rates through reaction network analysis *J.A. Manion,* *D.A. Sheen,* *I.A. Awan*	2B15: Tunneling in the 1,5 H-migration reaction of the prototypical O_2QOOH: $\cdot OOCH_2CH_2CH_2OOH$ *T.S. Dibble,* *Y. Sha*	2C15: A non-catalytic fuel-flexible reformer *C.-H. Chen,* *S. Sur,* *J. Thayer,* *H. Pearlman,* *P. Ronney*	2D15: Numerical modeling of urea injection and NO emission in a stoker boiler *M. Ghamari,* *S. Vats,* *A. Ratner*	2E15: A comparison of the reactive OH layer structure between CH_4-and DME-based turbulent non-premixed jet flames *H. Shen,* *J.A. Sutton*	2F15: Quantification of HO_2 from an atmospheric flow reactor using Faraday rotation spectroscopy *B. Brumfield,* *W. Sun,* *G. Wysock,* *Y. Ju*	2G15: A semi-analytical variable property droplet combustion model *J. Sisti,* *P.E. DesJardin*	2H15: Numerical investigation of influence of initial moisture content on thermal behavior of heated wood *S. Ferguson,* *B.L. Yashwanth,* *B. Shotorban,* *S. Mahalingam,* *D.R. Weise*
4:30	2A16: Experimental and modeling study of laminar flame speeds for alkyl aromatic components relevant to diesel fuels *P. Dirrenberger,* *O. Herbinet,* *R. Bounaceur,* *P.-A. Glaude,* *F. Battin-Leclerc,* *M. Mehl,* *W.J. Pitz*	2B16: Chemical kinetic study of extinction and autoignition of nonpremixed toluene flames *V. Amin,* *J. Lee,* *K. Seshadri,* *F. Williams*	2C16: Measuring the coefficient of thermal resistance for nanospring combustion catalysts *C. Quinn,* *J. Steciak,* *R. Budwig,* *S. Beyerlein*	2D16: Study of group coal particles ignition in a turbulent jet with LES simulation *Y. Wu,* *P.J. Smith,* *H. Zhang,* *J. Thornock*	2E16: Effects of high shear on the structure and thickness of turbulent premixed methane/air flames stabilized on a bluff body burner *G. Magnotti,* *R.S. Barlow*	2F16: Measurement and analysis of aluminum monoxide flame emission spectra *C. Parigger,* *D.M. Surmick,* *A.C. Woods,* *A.B. Donaldson,* *J.L. Height*	2G16: Modeling transitional burning modes of aluminum particles *B.T. Bojko,* *P.E. DesJardin,* *E.B. Washburn*	2H16: Sodium pool fire suppression with liquid nitrogen *D. An,* *P.B. Sunderland,* *D.P. Lathrop*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
4:50	2A17: KinBot 1.0: A code for automatic PES exploration *J. Zádor,* *H.N. Najm*	2B17: Optimized skeletal models of butane combustion *Y.X. Xin,* *D. Sheen,* *H. Wang,* *C.K. Law*	2C17: Numerical investigation of flame propagation in small thermally-participating adiabatic tubes *G.P. Gauthier,* *G.M.G. Watson,* *J.M. Bergthorson*	2D17: Transient simulations of char gasification *N.E.L. Haugen,* *R.E. Mitchell,* *M. Tilghman*	2E17: Premixed turbulent combustion in high Reynolds number regimes–of thickened flamelets and distributed reactions *J.E. Temme,* *A. Skiba,* *T. Wabel,* *J.F. Driscoll*	2F17: *In-situ* measurement of syngas temperature, water vapor and carbon dioxide in an engineering-scale, fluidized-bed coal gasifier *K. Sun,* *R. Sur,* *J.B. Jeffries,* *R.K. Hanson,* *T. Clark,* *J. Anthony,* *S. Machovec,* *J. Northington*		2H17: Analysis of water application in large-scale residential structures *N. Traina,* *D.C. Kyritsis,* *S. Kerber,* *G.P. Horn*
6:00	**Banquet - Pavillion**							

WEDNESDAY, May 22, 2013

7:15 Continental Breakfast in Grand Ballroom Lobby
WELCOME 7:45 AM

PLENARY LECTURE: 8:15
Kokopelli Grand Ballroom

Large Eddy Simulation of Complex Thermophysics in Advance Propulsion and Power Systems
Joseph C. Oefelein, Sandia National Laboratories

Session Chair: James Sutherland

9:15	**Break**							
Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
	Reaction Kinetics *Chair:* *I. Awan*	**Kinetics Modeling** *Chair:* *M. Renfro*	**Diagnostics** *Chair:* *F. Fuest*	**Flames/ Microcombustion** *Chair:* *J. Ahn*	**Turbulent Flames** *Chair:* *R. Barlow*	**Laminar Flames** *Chair:* *C. Smith*	**Coal/Biomass** *Chair:* *L. Qiao*	**Fire** *Chair:* *T. Fletcher*
9:35	3A01: An autoignition study of *iso*-butanol: Experiments and modeling *B.W. Weber,* *S.S. Merchant,* *C.-J. Sung,* *W.H. Green*	3B01: Jet fuels and Fischer-Tropsch fuels: Surrogate definition and chemical kinetic modeling *A.K. Narayana Swamy,* *P. Pepiot,* *H. Pitsch*	3C01: Ultra high speed rainbow schlieren deflectometry for statistical description of turbulent low-density jets *P.S. Kolhe,* *A.K. Agrawal*	3D01: Theory of flame acceleration in tubes due to wall friction: Intrinsic limitations and accuracy *B. Demirgok,* *V. Akkerman*	3E01: Studies of turbulent flame propagation and chemistry interaction at elevated temperatures and high Reynolds numbers *B. Windom,* *S.H. Won,* *B. Jiang,* *Y. Ju*	3F01: Effects of fuel dilution and gravity on laminar coflow methane-air diffusion flames: A computational and experimental investigation *S. Cao,* *B.A.V. Bennett,* *B. Ma,* *D. Giassi,* *D.P. Stocker,* *F. Takahashi,* *M.B. Long,* *M.D. Smooke*	3G01: Cetane number prediction from molecular structure using artificial neural networks *T. Sennott,* *C. Gotianun,* *R. Serres,* *J.H. Mack,* *R. Dibble*	3H01: Quantitative infrared image analysis of simultaneous upstream and downstream microgravity flame spread over thermally-thin cellulose in low speed forced flow *S.L. Olson,* *J.R. Lee,* *O. Fujita,* *M. Kikuchi,* *T. Kashiwagi*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
9:55	3A02: Experiments and modeling of the autoignition of methyl-cyclohexane at high pressure *B.W. Weber,* *W.J. Pitz,* *C.-J. Sung,* *M. Mehl* *E.J. Silke,* *A.C. Davis*	3B02: Temperature and pressure dependent rate coefficients for the reaction of vinyl radical with molecular oxygen *C.F. Goldsmith,* *L.B. Harding,* *J.A. Miller,* *S.J. Klippenstein*	3C02: Measurements of the temperature and velocity fields in a free shear flow between a vitiated stream and clean air stream using a Pr: YAG thermographic phosphor *D. Witkowski,* *D.A. Rothamer,* *A. Lynch,* *V. Belovich*	3D02: Reducing minimum flash ignition energy of Al microparticles by addition of WO_3 nanoparticles *Y. Ohkura,* *P.M. Rao,* *I.S. Cho,* *X. Zheng*	3E02: Scaling turbulent flame speeds of negative Markstein length fuel blends using leading points concepts *P. Venkateswaran,* *A. Marshall,* *J. Seitzman,* *T. Lieuwen*	3F02: Characteristics of laminar diffusion flames in a quiescent microgravity environment *F. Takahashi,* *N. Hennigan,* *D.P. Stocker,* *P.V. Ferkul,* *V.R. Katta*	3G02: The effects of fuel type and geometry on emissions and efficiency of natural draft semi-gasifier biomass cookstoves *J. Tryner,* *A.J. Marchese,* *B.D. Willson*	3H02: Ignition behavior of powdered cellulose by hot steel spheres *J.L. Urban,* *C.D. Zak,* *C. Fernandez-Pello*
10:15	3A03: Chemical structures of premixed *iso*-butanol flames *N. Hansen,* *S.S. Merchant,* *M.R. Harper,* *W.H. Green*	3B03: The oxidation of methyl formate and methanol: An updated kinetic model *P. Diévart,* *J.S. Santner,* *X. Yang,* *Y. Ju*	3C03: Whole-field optical measurements of sound wave propagation from high-speed exhaust jets *W.D. Mitchell,* *A.K. Agrawal*	3D03: Lean combustion of propane in a non-catalytic mesoscale counter-flow reactor *E.L. Belmont,* *J.L. Ellzey*	3E03: Extinction of stratified counterflow H_2/*air* premixed flames under intense turbulence and strain *S. Lyra,* *H. Kolla,* *B. Coriton,* *A. Gomez,* *J.H. Frank,* *J.H. Chen*	3F03: The effects of fuel and/or oxidizer composition on the structure of a laminar fuel jet in hot coflow under MILD conditions *A.V. Sepman,* *S.E. Abtahizadeh,* *A.V. Mokhov,* *J.A. van Oijen,* *H.B. Levinsky,* *L.P.H. de Goey*	3G03: Biomass pyrolysis and gasification of varying equivalence ratio in a lab-scale updraft gasifier *Y. Shi,* *E. Osgood,* *T. Sharma,* *A. Ratner*	3H03: Critical evaluation of parameter estimation techniques for pyrolysis of charring materials *Z. Ghorbani,* *R. Webster,* *M. Lázaro,* *A. Trouvé*
10:35	3A04: Oxidation reactivity characteristics of alternative aviation fuels *P.S. Veloo,* *S.H. Won,* *F.L. Dryer*	3B04: Predictive theory for the addition and insertion kinetics of $^1CH_2$ reacting with unsaturated hydrocarbons *D. Polino,* *S.J. Klippenstein,* *L.B. Harding,* *Y. Georgievskii*	3C04: High speed imaging and analysis of turbulent flames *J.B. Michael,* *H. Subramani,* *T.R. Meyer,* *J.D. Miller,* *M.N. Slipchenko,* *S. Roy,* *J.R. Gord*	3D04: A ceramic membrane reactor for methane combustion processes *P. Zeng* *K. Wang,* *R.L. Falkenstein-Smith,* *J. Ahn*		3F04: Detailed analysis of *iso*-pentanol combustion chemistry in flames *A. Lucassen,* *J. Warkentin,* *N. Hansen,* *S. Park,* *S.M. Sarathy*	3G04: Biomass pyrolysis and gasification of different biomass fuels *E. Osgood,* *Y. Shi,* *T. Sharma,* *A. Ratner*	3H04: A numerical study of solid fuel pyrolysis under time dependent radiant heat flux conditions *Z. Ghorbani,* *A. Trouvé*

10:55	**Break** **The 9th US National Meeting will be hosted by the Central States Section** **Location: Cincinnati, Ohio**							
Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
		Kinetics Modeling *Chair:* *S. Plessis*	**Diagnostics** *Chair:* *H. Miller*	**Microcombustion** *Chair:* *E. Belmont*		**Stationary Combustion** *Chair:* *P. Smith*	**Coal/Biomass** *Chair:* *E. Hecht*	**Fire** *Chair:* *X. Shi*
11:15		3B05: Optimizing time integration of chemical-kinetic networks for speed and accuracy *R.A. Whitesides,* *M.J. McNenly,* *D.L. Flowers*	3C05: Micro-hollow glow discharge analysis of carbonaceous materials *C.K. Gaddam,* *R.L. Vander Wal*	3D05: Analysis of a mesoscale fuel reformer with heat recirculation and porous surface stabilized flame *W.C. Thompson,* *A.K. Agrawal*		3F05: Fuel interchangeability effects on a scaled industrial boiler *A. Jordan,* *V. McDonell,* *S. Samuelsen*	3G05: Impact of selective oxygen injection on NO, LOI and flame luminosity in a fine particle, swirl-stabilized wood flame *J. Thornock,* *D. Tree,* *Y. Xue,* *V. Sadasivuni,* *R. Tsiava*	3H05: Convective ignition of forest fuels *S. McAllister,* *M. Finney*
11:35		3B06: Predictive theoretical kinetics of the pressure-dependent spin-forbidden reaction $O + CO \rightarrow CO_2$ *A.W. Jasper,* *R. Dawes*	3C06: Visualizing CH* chemiluminescence in sooting flames via image post-processing *S. Karnani,* *D. Dunn-Rankin*	3D06: *In Situ* plasma activated low temperature chemistry and subsequent *S*-curve transition in DME/oxygen/helium mixture *W. Sun,* *S.H. Won,* *Y. Ju*		3F06: A validation of flare combustion efficiency from LES *P.J. Smith,* *A. Jatale,* *J. Thornock,* *S. Smith*	3G06: A study of high-pressure CO_2 recycling using pinewood char gasification *I. Sircar,* *A. Sane,* *J.P. Gore*	3H06: Examination of the wildland-urban interface fire dynamics simulator in modeling of laboratory-scale surface-to-crown fire transition *D. Castle,* *W.E. Mell,* *F.J. Miller*

Room	Grand Ballroom I	White Pine I	Grand Ballroom II	Arrowhead I	Grand Ballroom III	Painted Horse	White Pine II	Arrowhead II
11:55		3B07: The influence of nitrogen chemistry on the effectiveness of alkyl nitrates as cetane enhancers: A modeling study *S.S. Goldsborough*	3C07: Development of a sensitive and selective laser diagnostic technique for measuring paramagnetic species *J.L. Lane,* *M.A. Stichter,* *N.P. Cernansky* *D.L. Miller*	3D07: Mixed heterogeneous-homogeneous combustion of dodecane in a parallel plate microreactor *E. Tolmachoff,* *W. Allmon,* *C.M. Waits*		3F07: Alternate fuel combustor operated on glycerol and methane *L. Jiang,* *A.K. Agrawal,* *R.P. Taylor*	3G07: Scaling laws associated with biomass cofiring and prediction of particle breakthrough of the volatile flame *M.L. Holtmeyer,* *B.M. Kumfer,* *S. Li,* *R.L. Axelbaum*	3H07: Semi-empirical fire spread simulator for manzanita, Utah juniper and chamise shrubs *D.R. Prince,* *C. Shen,* *T.H. Fletcher*
12:15		3B08: Adaptive preconditioning strategies for integrating large kinetic mechanisms *M.J. McNenly,* *R.A. Whitesides,* *D.L. Flowers*	3C08: A flash photolysis facility for fundamental HO_2 studies *J.L. Lane,* *M.A. Stichter,* *N.P. Cernansky,* *D.L. Miller*	3D08: Electric field effects on carbon monoxide release from impinging flames *Y.C. Chien,* *D. Dunn-Rankin*		3F08: Ash deposition during oxy-coal combustion under high inlet O_2 concentration conditions *Z. Zhan,* *L.E. Bool,* *A. Fry,* *W. Fan,* *M. Xu,* *D. Yu,* *J.O.L. Wendt*	3G08: A fluidized bed model of the fuel reactor for a chemical looping with oxygen uncoupling process *A.H. Sahir,* *H.Y. Sohn,* *J.S. Lighty*	3H08: Opposed-flow flame spread in a narrow channel apparatus over thin PMMA sheets *G.R. Bornand,* *F.J. Miller,* *J.M. Pepper,* *S.L. Olson,* *I.S. Wichman*
12:35		3B09: CANTERA simulations of water-laden methane/air nonpremixed counterflow flames *V. Ricchiuti,* *R.E. Padilla,* *S. Karnani,* *D. Dunn-Rankin*	3C09: Stimulation of 2D tomographic TDLAS using algebraic reconstruction and Tikhonov regularization *A. Guha,* *I. Schoegl*	3D09: The influence of electric field power systems on flame behavior *K. Yamashita,* *Y.C. Chien,* *S. Karnani,* *D. Dunn-Rankin*			3G09: Impact of co-firing coal and biomass on char conversion under dry gasification conditions *M.B. Tilghman,* *R.E. Mitchell*	3H09: Direct numerical simulation of near-wall combustion in a momentum-driven turbulent boundary layer flow *L. Bravo,* *A. Voegele,* *A. Trouvé*
12:55	**ADJOURN** **LAB TOURS 2:10 – 4:10**							

TUESDAY WORK-in-PROGRESS POSTERS

2P01: **CSS OUTREACH PROJECT:** Teaching combustion in a first-year high school chemistry class
Tim McLinden

2P02: **CSS OUTREACH PROJECT:** Catching a mystic tiger by the tail: High powered rocketry in secondary education
Melissa E. McCarthy

2P03: Combustion characteristics of cylindrical premixed burner for condensing gas boiler
Pil Hyong Lee, Sang Soon Hwang

2P04: Particulate matter (PM10) emission during combustion of a high silicon Chinese coal and a Canadian coal
Chong Tian, Qingye Lu, Rajender Gupta, Hongbo Zeng, Junying Zhang

2P05: Quantitative two-photon laser-induced fluorescence of CO in a coflow time-varying methane/air flame
Davide Giassi, Marshall B. Long

2P06: Full field temperature measurement in sooting coflow diffusion flames
Nathan Kempema, Bin Ma, Marshall B. Long

2P07: Large-scale reduced-gravity flame spread test
David Urban, Gary Ruff, Grunde Jomaas, James S. T'ien, Carlos Fernandez-Pello, Jose Torero, Guillaume Legros, Christian Eigenbrod, Nickolai Smirnov, Osamu Fujita, Sebastian Rouvreau, Balazs Toth, Olivier Minster

2P08: Effect of longitudinal oscillations on downward flame spread over thin solid fuels
Vedha Nayagam, Kurt Sacksteder

2P09: Combustion inhibition and enhancement of cup-burner flames by CF_3Br and C_2HF_5 fire extinguishing agents
Fumiaki Takahashi, Viswanath R. Katta, Gregory T. Linteris

2P10: A ternary flame system for soot oxidation studies
Peter B. Sunderland, Haiqing Guo, Paul Anderson

2P11: A mechanistic study of nanocomposite thermite reactions by time-resolved mass spectrometry
Guoqiang Jian, Nicholas Piekiel, Snehaunshu Chowdhury, Kyle Sullivan, Michael Zachariah

2P12: The effects of various engine actuator set-points on the predicted combustion trajectory using a two-zone model at conventional and low temperature combustion conditions
Joshua Bittle, Timothy J. Jacobs

2P13: Two-zone thermodynamic model to predict temporal variation in end-gas pressure in a CHP engine
Howard Levinsky, Sander Gersen, Martijn van Essen, Gerco van Dijk

2P14: Effects of temperature and equivalence ratio on soot precursors in rich premixed flames
Vivien R. Lecoustre, Peter B. Sunderland, Beei-Huan Chao, Richard L. Axelbaum

2P16: Prediction of local entropy production in turbulent combustion using large eddy simulation
Mehdi Safari, Fatemeh P.M. Hadi, M. Reza H. Sheikhi

2P17: Turbulent counterflow flames
Ranjith Tirunagari, Stephen B. Pope, Alessandro Gomez, Jonathan Frank

2P18: A combined modeling and experimental study of the combustion of 1,3 butadiene/butanol
Nils Hansen, Marina Braun-Unkhoff, Trupti Kathrotia

2P19: Confinement effects in systems of multiple explosive devices
Jacqueline Beckvermit, Chuck Wight

2P20: Soot oxidation kinetics: Pressure and fuel comparisons
JoAnn S. Lighty, Joseph Levinthal, Isabel C. Jaramillo

2P21: Accurate theoretical kinetics of the 1-butyl + O_2 reaction
Ewa Papajak, Judit Zádor

2P22: Kinetics of the reactions of methyl radicals with toluene
Iftikhar Awan, Jeffrey A. Manion

2P23: Evaluations and predictions of enthalpies of formation for polycyclic aromatic hydrocarbons and derivatives
Donald Burgess, Thomas Allison

2P24: Extinction limits for combustion systems involving competing reactions
Matthew Tanzy, Vladimir Volpert, Alvin Bayliss

2P25: Kinetics of peroxy radicals and QOOH formed in autoignition of methyl butanoate
Theodore Dibble, Feng Zhang, Yuge Jiao, Matthew Zelie

2P26: Improved kinetic mechanism for high-temperature decomposition of *n*-butanol
Subith Vasu, S. Mani Sarathy

2P27: Relative roles of structure and chemistry on the oxygenated fuel soots reactivity
Chethan K. Gaddam, Chung-Hsuan Huang, Randy Vander Wal

2P28: Using Reaction Mechanism Generator (RMG) to build detailed kinetic models of biodiesel combustion
Fariba Seyedzadeh Khanshan, Richard H. West

2P29: Automatic transition state searches for reaction mechanism generation
Pierre L. Bhoorasingh, Richard H. West