11th US National Combustion Meeting

Hosted by Caltech, USC, and the WSSCI March 24-27, 2019 Pasadena, CA, USA









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Code of Conduct

The Board of the US Sections of The Combustion Institute (USSCI) approved this Code of Conduct, December 5th, 2018 for the purpose of the 11th US National Combustion Meeting in Pasadena, CA. This document complements the Code of Ethics adopted by the Board of Directors of The Combustion Institute, 23 March 2017.

The Western States Section of The Combustion Institute (WSSCI) is committed to providing a safe environment for all its members free from unlawful harassment. Harassment in any form, based on sex, gender, gender identity and expression, sexual orientation, age, disability, race, ethnicity, religion (or lack thereof), medical condition, pregnancy, or any other protected characteristics recognized by law, is a violation of the Code of Conduct. Everyone should be treated with respect without fear of discrimination, quid pro quo, or condescension whether blatant or via microaggressions. This policy applies to all members of The Combustion Institute and covers behavior that takes place at any programs or activities related to the 11th National Combustion Meeting.

Reporting an Incident of Violation of the Code of Conduct

The WSSCI takes all reports of behavior prohibited by the Code of Conduct seriously and encourages any individual who experiences or witnesses such behavior to report, including anonymously, such violations to the Chair or the Vice-Chair of the WSSCI, including by email. The WSSCI encourages the prompt reporting of such matters to ensure a timely and constructive resolution.

The Chair and the Vice-Chair will evaluate each report to determine the most appropriate response, including both informal and formal responses. The desired response of the reporting party will be taken into account but cannot be determinative of the WSSCI's response. In meeting with the reporting party, the Chair and the Vice-Chair will explain that reports will be handled with sensitivity and kept as confidential as possible to respect the privacy of all parties.

Informal and formal responses are initiated to stop the prohibited behavior and prevent its reoccurrence. Possible responses and outcomes include, but are not limited to, issuing a warning to cease the behavior before further sanctions are pursued; separation of the involved persons; exclusion from the remainder of the current and/or future programs and activities; and, revoking membership. The WSSCI will maintain a written record of the report and corresponding response.

Any person who experiences or witnesses prohibited behavior also has reporting options outside of the WSSCI, including filing a report with their home institution or the police.

Retaliation

The WSSCI does not tolerate any kind of retaliation against an individual filing a report or assisting in the resolution of a report of prohibited behavior (even if no responsive action is taken). Retaliation is a violation of the Code of Conduct. The WSSCI takes reports of retaliation very seriously. Anyone who experiences or witnesses retaliation in any form should report it immediately to the Chair and the Vice Chair.

Schedule of Events – Weekend

Combustion Early Career Investigator Workshop

Saturday 08:00 – 17:00 Caltech

Sunday 08:00 – 12:00

Open to early career faculty member, or national lab researcher in an equivalent position at a US institution working in or around the area of combustion. This workshop will bring together early career investigators to discuss cultural issues facing the community. Support from the National Science Foundation under grant CBET-1901570. https://combustion-community.github.io/workshop-2019/

Cantera Workshop

Sunday 08:30 – 12:00 Room 211

13:15 - 17:00

Cantera is an open-source suite of software tools for problems involving kinetics, thermodynamics, and transport. The Cantera Workshop and Forum will cover basic and advanced usage of Cantera and getting started with Cantera development. The Workshop will be hosted by the lead developers of Cantera. For more information please visit https://cantera.github.io/ncm-2019-workshop/

Exponent Info Session

Sunday 17:00 – 18:00 Room 212/214

Tuesday 12:40 – 13:30

Exponent will be hosting two information sessions about career opportunities at their firm. Come to hear about exciting careers in engineering consulting! Consultants from Exponent will be on hand to answer questions. Open to all levels, graduate students, post-docs, and faculty too. https://www.exponent.com/

Executive Board Meetings

Sunday 12:00 – 17:00 Room 208 – CSSCI 14:30 – 17:00 Room 209 – WSSCI 15:00 – 17:00 Room 210 – ESSCI

Welcome Reception

Sunday 18:00 – 20:00 Atrium (upper and lower floors)

Perfect time to see the Combustion Artworks on display at the main entrance and the Work in Progress Posters located throughout the convention center.

Schedule of Events – Week

Mentoring Mixer

Monday 18:00 – 20:00 Ballroom DE

Open to US members from all career levels, this new event is intended to form a matrix of potential mentors and mentees based on their mentoring needs/expertise. The goal is to provide support for members at any point in their career, from students wishing to explore industry options and hone their resumes, to associate professors looking for advice to expand their research program in new directions.

Women in Combustion Luncheon

Tuesday 12:25 – 13:40 Room 211

This event is a networking luncheon for female-identifying participants. Founded in 2007 with the goal to promote and advance women in the field of combustion, the Women in Combustion (WiC) group is made up of industry professionals, students, professors, and government workers. Attendees will be invited to discuss topics relevant to women in STEM over lunch.

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Banquet

Tuesday 18:30 – 22:00 California Science Center (CSC)

Visitors will enter the California Science Center through the renowned *Ecosystems* display, then enjoy a reception and dinner underneath *Space Shuttle Endeavour*. <u>Note:</u> buses will leave the Convention Center at 17:30; the first bus will leave the CSC at 20:30; the last bus will leave at 22:30. Expect a 30min drive to/from the CSC. https://californiasciencecenter.org/exhibits/air-space/space-shuttle-endeavour.

Tour of NASA/JPL

Wednesday 09:30 – 12:00 Jet Propulsion Laboratory (JPL)

13:00 – 15:30

The tour includes a multimedia presentation on JPL entitled "Journey to the Planets and Beyond," which provides an overview of the Laboratory's activities and accomplishments. Guests will visit the von Karman Visitor Center, the Space Flight Operations Facility, and the Spacecraft Assembly Facility. Each tour limited to 80 people. Note: government issued ID is required and restrictions apply to Designated Countries. The buses will leave 45min before the tour start time. Expect a 15min drive.

11th U.S. National Combustion Meeting, Pasadena, California

Sunday, 24 March 2019

08:00-20:00 Registration Open – Atrium of the Convention Center (Upper Floor) 18:00-20:00 Welcome Reception – Atrium of the Convention Center (Upper and Lower Floors)

Monday, 25 March 2019

07:00-16:00 Registration Open – Atrium of the Convention Center (Upper Floor) 08:00-18:00 Combustion Artwork is displayed at the main entrance on the Upper Floor near the registration desk. Make sure to stop by, visit and vote. Voting closes Tuesday at 17:30 08:00-16:35 Sponsors are displayed in the Atrium Lower Floor

Work in Progress Posters (Display Set up 07:00 – 08:00, Poster Session 08:00 – 18:00) – Upper and Lower Floors of the Atrium

Room 102 - 104

07:45 Welcome: Fletcher J. Miller, *San Diego State University*, WSSCI Chair 07:55 Opening Remarks: Guillaume Blanquart, *The California Institute of Technology*, Local Host

08:00 – 09:00 Plenary Lecture: Dr. Chiping Li, Air Force Office of Scientific Research – Wright Patterson Air Force Base "Some Recent Progress and Remaining Challenges in Fundamental Combustion Research"

Session Chair: Michael E. Mueller

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
09:35	Room 106 Chemical Kinetics I Session Chair: S.J. Klippenstein 1A01: Low- temperature oxidation of tetrahydro- furan N. Hansen, K. Moshammer, A. W. Jasper	Room 107 Chemical Kinetics II Session Chair: C.F. Goldsmith 1B01: Filtering in combustion data assimilation Y. Tao, Y. Zhang, F. Boso, D.M. Tartakovsky, H. Wang	Room 102 Turbulent Flames Session Chair: J.H. Chen 1C01: Effect of turbulence on chemistry in single element shear coaxial rocket injector S. Badillo-Rios, A.R. Karagozian	Room 212 Fire Session Chair: A. Trouvé 1D01: Comparison of emissions from liquid-fueled pool fires and fire whirls S.B. Hariharan, J. Dowling, H.F. Farahani,	Engines Session Chair: Z. Yue 1E01: Investigation of the spray and combustion characteristics of four multi- component	Room 101 Laminar Flames Session Chair: J. Tinajero 1F01: Effect of octane sensitivity on PAH emissions in low octane naphtha flames K.C. Kalvakala, S.K. Aggarwal	Room 208 Engines II Session Chair: J.H. Mack 1G01: Neural networks applied to predicting diesel fuel spray characteristics Z.B. Harris, A.K. Agrawal,	Detonations Session Chair: G. Goodwin 1H01: Acceleration of deflagration-to-detonation transition through ozone addition in C ₂ H ₂ /O ₂	Room 207 Soot Session Chair: J. Camacho 1J01: PAH formation from jet stirred reactor pyrolysis of gasoline surrogates C. Shao, G. Kukkadapu,	Coal Session Chair: E. Beagle 1K01: Sub- micron ash aerosol formation in oxy-coal combustion at atmospheric and elevated
				M.J. Gollner, E.S. Oran, K. Stone	diesel surrogate fuels relative to their commercial target fuel K. Yasutomi, C.J. Mueller, L.M. Pickett, S.A. Skeen		J.A. Bittle	mixtures in microchannels J. Sepulveda, A.C. Rousso, H. Ha, T. Chen, V. Cheng, W. Kong, Y. Ju	S.W. Wagnon	pressures X. Li, Y. Wang, J.O.L. Wendt

SS SS SS SS SS SS SS S	Chemical Kinetics I Session Chair: S.J. Klippenstein 1A02: Speciation studies during low-to- intermediate temperature oxidation of n-heptane in a motored engine	Chemical Kinetics II Session Chair: C.F. Goldsmith 1B02: The application of artificial neural network in variational transition state theory X. Chen, C.F. Goldsmith	Turbulent Flames Session Chair: J.H. Chen 1C02: Retrospective Lagrangian analysis of turbulence- chemistry interactions in highly-turbulent	Fire Session Chair: A. Trouvé 1D02: Effect of carbon nanotubes addition on the flame spread rate over a Jet A pool	Engines Session Chair: Z. Yue 1E02: End-gas autoignition fraction and flame propagation rate in laser-	Laminar Flames Session Chair: J. Tinajero 1F02: Exploring N ₂ O emissions from lean premixed	Engines II Session Chair: J.H. Mack 1G02: Prediction of autoignition and flame	Detonations Session Chair: G. Goodwin 1H02: Effect of capacitive discharge	Soot Session Chair: J. Camacho 1J02: Reactive molecular dynamics	Coal Session Chair: E. Beagle 1K02: Uncertainty quantification
S st ld ir te o n n n e	Speciation studies during low-to- intermediate temperature oxidation of n-heptane in a motored engine	application of artificial neural network in variational transition state theory <i>X. Chen,</i>	1C02: Retrospective Lagrangian analysis of turbulence- chemistry interactions in	carbon nanotubes addition on the flame spread rate over a Jet A	autoignition fraction and flame propagation	Exploring N ₂ O emissions from lean premixed	Prediction of autoignition	of capacitive discharge	molecular dynamics	Uncertainty
K	E. Al-Gharibeh, K. Kumar		premixed flames P.E. Hamlington, R. Darragh, C.A.Z. Towery, A.Y. Poludnenko	R. Roncancio, A. Navarkar, V.R. Hasti, V. Goyal, J.P. Gore	ignited primary reference fuel mixtures at elevated temperature and pressure A. Zdanowicz, J. Mohr, J. Tryner, K. Gustafson, B. Windom, D. Olsen A.J. Marchese	hydrogen and natural gas laminar flames stabilized by a flat flame burner C. Hernandez, M. Yoshioka, V. McDonell	properties for multicomponent fuels using machine learning techniques N. Shah, P. Zhao, D. DelVescovo, H. Ge	ignition on plasma combustion of propane-air mixture K. Kim, S. Roy, S. Zare, O. Askari	simulations of the yield sooting indices of amines H. Kwon, S. Shabnam, M.J. Montgomery, F. Guo, C.S. McEnally, L.D. Pfefferle, A.C.T. van Duin, Y. Xuan	and validation of a 15MW oxy- fired coal combustion system J.C. Parra-Álvarez, S. Smith, B. Isaac, M. Zhou, P. Smith
F g cl	1A03: Functional group chemistry of low- temperature biofuel oxidation B. Rotavera, C.A. Taatjes	1B03: LES/PDF of Sandia flame D using a pre- partitioned adaptive chemistry (PPAC) methodology A.S. Newale, Y. Liang, S.B. Pope, P. Pepiot	1C03: Assessing the impact of multicomponent transport on the vorticity budget of turbulent premixed flames <i>A.J. Fillo, K.E. Niemeyer</i>	1D03: Swirling dynamics in liquid-pool fires:transitions between pool fires, fire whirls, and blue whirls W. Coenen, E. Kolb, A.L. Sánchez, F.A. Williams	1E03: Autoignition characteristics of hydrotreated vegetable oil and ultra low sulfur diesel and their blends in ignition quality tester S. Alkhayat, G. Joshi, N. Henein	1F03: Head-on quenching of laminar methane-air flames on a wall at temperatures below 300 K T.F. Guiberti, J.S. Damazo, E. Kwon, W.L. Roberts, D.A. Lacoste	1G03: Chemical explosive mode analysis of lean blowout in a gas turbine combustor C. Xu, P. Kundu, T. Lu, S. Som	1H03: Effect of unequal blockage ratio and obstacle spacing on wave speed and overpressure during flame propagation in premixed H2/O2 mixtures C.B. Ahumada, Q. Wang, E.L. Petersen	nethod for spatially-resolved quantitation of large polycyclic aromatic hydrocarbons in laminar sooting flames K. Gleason, F. Carbone, A.J. Sumner, B.D. Drollette, D.L. Plata, A. Gomez	1K03: Bayesian parameter estimation for a Large-Eddy Simulation (LES) based coal NOx model O. Díaz, J. Thornock, S. Smith, B. Isaac, D. Harris, D. Chen, Z. Li, P. Smith

Combustion Artwork is displayed at the main entrance on the upper floor near the registration desk.

Voting closes Tuesday at 17:30

Winners will be announced Tuesday night at the Bangquet

Sponsors are displayed in the Atrium Lower Floor

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
10:35	Chemical Kinetics I Session Chair: S.J. Klippenstein 1A04: Studies	Chemical Kinetics II Session Chair: C.F. Goldsmith 1B04: A	Turbulent Flames Session Chair: J.H. Chen 1C04: A non-	Fire Session Chair: A. Trouvé 1D04: The	Engines Session Chair: Z. Yue 1E04: Impact	Laminar Flames Session Chair: J. Tinajero 1F04:	Engines II Session Chair: J.H. Mack	Detonations Session Chair: G. Goodwin	Soot Session Chair: J. Camacho	Coal Session Chair: E. Beagle
	of low and high temperature oxidation of n-pentane with nitric oxide and nitrogen dioxide additions in a jet stirred reactor H. Zhao, A.G. Dana, Z. Zhang, W.H. Green, Y. Ju	unifying analytical framework of using Jacobian matrices with consistent state vectors P. Sharma, A. Newale, S. Pope, P. Pepiot	local analysis of strong fluctuations in non-premixed turbulent jet flames M. Gauding, D. Denker, Y. Brahami, M. Bode, E. Varea, L. Danaila	influence of an immersed heater on pool fire burning behaviors X. Pi, L. Chang, A.S. Rangwala	of ethanol additions on autoignition characteristics of a full boiling range gasoline and its surrogates at advanced engine conditions D. Kang, A. Fridyland, S.S. Goldsborough, M. Mehl, S. Wagnon, W.J. Pitz, M.J. McNenly	Experiments and modeling of NOx formation in premixed stagnation flames of a typical jet A K. Wan, C. Saggese, R. Xu, H. Wang	Mapping the dual-fuel combustion modes of a light-duty diesel engine at medium speed and low load J. Martin, A. Boehman		Development of a data-derived sooting index that includes effects of oxygen-containing fuel components <i>P.C. St. John, S. Kim, R.L. McCormick</i>	

10:55 – 11:20 Break with beverages and light snacks available in the Upper and Lower Floors of the Atrium

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Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
11:20	Chemical Kinetics I Session Chair: W. Sun 1A05:	Chemical Kinetics II Session Chair: SS. Vasu 1B05:	Turbulent Flames Session Chair: M.E. Mueller 1C05: Do	Fire Session Chair: K. Hinnant 1D05: Effect of	Engines Session Chair: P.M. Allison	Laminar Flames Session Chair: V. Akkerman 1F05:	Laminar Flames II Session Chair: K.E. Niemeyer 1G05:	Detonations Session Chair: C.F. Lietz 1H05:	Soot Session Chair: G.M. Fioroni	Coal Session Chair: J.C. Parra-Álvarez
11.20	Influence of chemically termolecular reactions on species concentrations during RDX combustion R.E. Cornell, C.E. LaGrotta, M.C. Barbet, M.P. Burke	Understanding of the differences of graph-based mechanism reduction methods through a new species block strategy <i>G. Xiao</i>	turbulent nonpremixed cool flames require special treatment? A.G. Novoselov, C.B. Reuter, O.R. Yehia, Y. Ju, M.E. Mueller	initial fuel temperature on flame spread rate of alternative aviation fuels V. Goyal, R. Roncancio, J. Kim, A. Navarkar, V.R. Hasti, J.P. Gore	Examination of predictive flame blow off boundaries for premixed fuel/air reactions at gas turbine premixer conditions C. Hernandez, V. McDonell	Numerical investigation of real gas effects in premixed CH4 - O2 flames at cryogenic conditions A. Gopal, P.S. Volpiani, S. Yellapantula, J. Larsson	Application of physics-based machine learning in combustion modeling A. Takbiri-Borujeni, M. Ayoobi	Extension of detonation limits using ozone as an additive X. Shi, J. Crane, H. Wang	Experimental and theoretical study of the soot-forming tendencies of furans as potential biofuels J. Zhu, H. Kwon, C.S. McEnally, Y. Xuan, P.C. St. John, S. Kim, L.D. Pfefferle	Assessment of various tar and soot treatment methods for use in coal combustion simulation J. McConnell, J.C. Sutherland

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	Chemical Kinetics I Session Chair: W. Sun	Chemical Kinetics II Session Chair: SS. Vasu	Turbulent Flames Session Chair: M.E. Mueller	Fire Session Chair: K. Hinnant	Engines Session Chair: P.M. Allison	Laminar Flames Session Chair: V. Akkerman	Laminar Flames II Session Chair: K.E. Niemeyer	Detonations Session Chair: C.F. Lietz	Soot Session Chair: G.M. Fioroni	Coal Session Chair: J.C. Parra-Álvarez
11:40	1A06: Analysis of RDX mono- propellant combustion wave structure using a model with detailed condensed- phase kinetics M. Khichar, L. Patidar, S.T. Thynell	1B06: An automatic rate-based algorithm for building reduced kinetic mechanisms and interaction modules L. Backer, P. Pepiot	1C06: Evolution of local flame displacement speeds in turbulence <i>H.L. Dave</i> , <i>S. Chaudhuri</i>	1D06: Experimental investigation of hot surface ignition temperatures for aviation fuels V. Goyal, Y. Tursyn, V.R. Hasti, J.P. Gore	1E06: Flame stability for a premixed jet in vitiated coflow T.C. Owens, S.W. Grib, M.W. Renfro	1F06: Influence of low- and high- temperature chemistries on flame propagation in supercritical fluids W. Liang, X. Yang, C.K. Law	1G06: Performance analysis of an implicit, fully- coupled method for simulating reactive flows N. Deak, F. Bisetti	1H06: Explosion characteristics measurements of propane- argon-oxygen mixture A. Farhat, M. Jansons, O. Samimi-Abianeh	1J06: A numerical study on the sooting tendencies of Co-Optima bio-derived blendstocks H. Kwon, K. Zhang, S.W. Wagnon, W.J. Pitz, J. Zhu, C.S. McEnally, L.D. Pfefferle, Y. Xuan	1K06: Predicting smoke emissions using a compositional linear trend D.R. Weise, T.J. Johnson, J. Palarea- Albaladejo, H. Jung
12:00	1A07: Thermogravim etric analysis and chemical kinetic study of HMX decomposition in liquid phase L. Patidar, M. Khichar, S.T. Thynell	1B07: Re- analysis of methoxy decomposition measurements at high temperature C. Santana- Ramirez, J. Santner	1C07: Evolution of turbulent flame speed of premixed flames H.L. Dave, S. Chaudhuri	1D07: Design of an experimental apparatus to measure Minimum Hot Surface Ignition Temperature (MHSIT) of aviation fluids M.S. Ulcay, L.N. Dillard, J.P. Gore, P.C. Sweeney	1E07: Multimodal instability characteristics of a high pressure, turbulent, premixed jet flame T. Buschhagen, R. Gejji, L. Tran, C.D. Slabaugh	1F07: The effect of working fluids on premixed hydrogen combustion in a constant volume combustion chamber M. Morovatiyan, M. Shahsavan, J. Aguilar, J.H. Mack	1G07: A direct method for calculating the turning points of perfectly stirred reactors <i>Y. Wu, T. Lu</i>	1H07: Quenching limits and dynamics of multidimension al detonation waves confined by an inert layer S. Taileb, J. Melguizo- Gavilanes, A. Chinnayya	1J07: Soot characteriza- tion of burning wildland porous fuel bed N. Mofidi, J. Hashempour, M.T. Timko, A. Simeoni	1K07: Early stage sub-micron particle formation during pulverized coal combustion in a two-stage flat flame burner D. Khatri, Z. Yang, A. Gopan, R.L. Axelbaum
12:20	1A08: Heterogeneous catalysis of hydrogen peroxide vapor on platinum B.L. Rhodes, P.D. Ronney, J.D. DeSain	1B08: The pyrolysis chemistry of propionic acid and ethyl propionate in a microreactor C. Rogers, K. Cummins, J. Porterfield, J. Daily, B. Ellison, N. Labbe	1C08: Turbulent deflagrations of mildly flammable refrigerant-air mixtures P. Papas, P. Verma, R. Lord, L. Burns	1D08: Laser induced incandescence measurement of soot in buoyant turbulent diffusion flames under different oxygen indexes G. Xiong, D. Zeng, P.P. Panda, Y. Wang	1E08: Chemical kinetic preferential vaporization impacts on lean blow-out behaviors of jet fuels S.H. Won, N. Rock, S.J. Lim, S. Nates, D. Carpenter, B. Emerson, T. Lieuwen, T. Edwards, F.L. Dryer	1F08: Binary diffusion coefficients of polycyclic aromatic hydrocarbons: A molecular dynamics study <i>C. Liu, H. Wang</i>	1G08: Accelerating laminar flamelet calculations; application to sooting tendencies of co-flow diffusion flames S. Lapointe, Y. Xuan, R.A. Whitesides, M.J. McNenly	1H08: Effects of low-temperature chemistry and turbulent transport on knocking formation for stratified dimethyl ether/air mixtures T. Zhang, W. Sun, L. Wang, Y. Ju	1J08: Measuring the sooting tendencies of terpenes as potential biofuels P.A. Cherry, C.S. McEnally, J. Zhu, L.D. Pfefferle	1K08: Ash aerosol and deposition formation with changing alkali-Cl-S additives during coal combustion X. Li, Y. Wang, T. Allgurén, K. Andersson, D. Gall, J.O.L. Wendt

12:40 – 13:55 Section Meetings Lunch

Please report to your Section meeting rooms:
Eastern States Section: Ballroom BC
Central States Section: Ballroom FG
Western States Section: Ballroom DE
All other attendees: Ballroom A

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I Session Chair: R.S. Tranter	Chemical Kinetics II Session Chair: N.J. Labbe	Turbulent Flames Session Chair: M. Rieth	Fire Session Chair: E.S. Oran	Engines Session Chair: S. Yang	Laminar Flames Session Chair: M. Ayoobi	Heterogeneous Combustion Session Chair: R. Sui	Detonations Session Chair: P. Pal	Soot Session Chair: A. Josephson	Coal Session Chair: J. Graña-Otero
13:55	1A09: C14 polycyclic aromatic hydrocarbons are formed by acetylene addition to naphthyl radicals M.C. Smith, TC. Chu, W.H. Green	1B09: An accurate reaction model for the high-temperature pyrolysis of silane and disilane K.P. Chatelain, R. Alharbi, R. Mével, E.L. Petersen, D.A. Lacoste	1C09: Assessing different subfilter mixing models for combustion in large eddy simulations A. Jain, S.H. Kim	1D09: A wide band gas radiation model for fire CFD simulations I. Sikic, O.O. Oluwole, J. Wen, S. Dembele, B. Wu, X. Zhao, K.V. Meredith, Y. Wang	1E09: Towards improved mesh-designing techniques of spark-ignition engines in the framework of spectral element methods T. Chatterjee, S.S. Patel, M.M. Ameen	1F09: Globally oscillating propagation of cellular expanding flames in constant pressure J. Huo, A. Saha, T. Shu, Z. Ren, C.K. Law	1G09: Flame as a unique method for the synthesis of hydrophobic C-layers D. Merchan- Breuer, E. Murphy, B. Berka, A. Abdihamzehkolaei, W. Merchan- Merchan	1H09: Examination of detailed methane/oxy- gen kinetics in the context of detonation simulations C.F. Lietz, S.A. Schumaker, V. Sankaran	1J09: Predicting PAH exciplex fluorescence: A TDDFT study R.A. Krueger, G. Blanquart	1K09: Characteristics of pressurized oxy-coal combustion in a 100 kWth, 15 bar combustor Z. Yang, D. Khatri, T. Li, R.L. Axelbaum
14:15	1A10: From benzene to naphthalene, direct measurement of ring growth in polycyclic aromatic hydrocarbon formation TC. Chu, M. Smith, A.B. Uwagwu, Z.J. Buras, W.H. Green	1B10: Ethanol kinetics modeling at low to intermediate temperature A. Zyada, O.S. Abianeh	1C10: Dynamically dominant interscale couplings in the nonlinear chemical source terms for species evolution in premixed turbulent combustion with application to LES modeling P.L.K. Paes, Y.G. Shah, Y. Xuan, J.G. Brasseur	1D10: Progress towards high fidelity simulations of large-scale fires C. Lapointe, N.T. Wimer, J.F. Glusman, A.S. Makowiecki, J.W. Daily, G.B. Rieker, P.E. Hamlington	1E10: Combustion modelling and simulation of dilute syngas fuels in a CFR engine G. Padhi, A. Balu, D. Olsen, B. Windom	1F10: An experimental study of cell-induced flame acceleration during the compression stage of confined spherical flame propagation C. Xiouris, J. Jayachandran, A. Movaghar, R. Lawson, T. Ye, F.N. Egolfopoulos	1G10: Flame synthesis nanostructures with complex morphologies and hybrid- nature W.C. Jimenez, W. Merchan-Merchan	1H10: Effect of a diffuser on conditioning flow field fluctuations at the exit of a methane-fueled rotating detonation combustor J. Tobias, D. Depperschmidt, R. Miller, M. Uddi, A.K. Agrawal	1J10: The effects of the interactions between aromatics on soot formation <i>C. Chu, M.J. Thomson</i>	1K10: Experimental and numerical modeling of laminar coal flames L. McLaughlin, R. Mokhtarpoor, E. Beagle, C. Dunn, M. Stoellinger, E. Belmont

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
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14:35	1A11: Ring opening of cycloalkanes at high temperatures <i>T. Sikes</i> , <i>R.S. Tranter</i>	1B11: RON and MON chemical kinetic modeling study J.A. Corrubia, J.M. Capece, N.P. Cernansky, D.L. Miller, P.M. Najt, R.P. Durrett	1C11: Differential diffusion modelling in LES/TPDF simulations of turbulent flames H. Zhou, T. Yang, W. Xie, Z. Ren	1D11: Simulation of unsteady radiation effects in laminar diffusion flames R. Xu, A. Marchand, V.M. Le, T. Rogaume, F. Richard, J. Luche, A. Trouvé	1E11: 3-D modeling of the CFR engine for the investigation of knock on natural gas D. Bestel, B. Windom, D. Olsen, S. Bayliff, H. Xu	1F11: Stratified spherical flame propagation of low molecular weight fuels in the presence of electric fields C. Scudiere, JY. Chen, X. Shi, N. Lebherz, S. Yu	1G11: Reaction propagation in a printed Al/CuO composite observed using high-speed microscopy and thermometry H. Wang, D.J. Kline, M.R. Zachariah	1H11: Boundary layer ignition modeling S.A. Coronel, S. Lapointe, J.E. Shepherd	1J11: On the growth of Polycyclic Aromatic Hydrocarbons (PAHs) in a coflow diffusion flame T. Mirra, C. Chu, T. Zhang, A.D. Sediako, M.J. Thomson	1K11: Improvement of computational efficiency for discrete transfer radiation calculations through the use of dimensionally adaptive mesh techniques T. Williams, B.R. Adams
14:55	1A12: Kinetic studies of excited singlet oxygen atoms O(¹D) reactions with methanol and ethanol H. Zhong, C. Yan, C.C. Teng, T. Chen, A.C. Rousso, G. Wysocki, Y. Ju	1B12: Foundational fuel chemistry model Y. Zhang, Y. Tao, G. Smith, H. Wang	IC12: Application of the hierarchical parcel swapping (HiPS) model to turbulent reacting flows D. Lignell, A. Kerstein, A. Perego, T. Starick, J. Frei, H. Schmidt	ID12: Simulations of a turbulent line fire with a steady flamelet combustion model and nongray gas radiation models V.M. Le, R. Xu, A. Marchand, S. Verma, T. Rogaume, F. Richard, J. Luche, A. Trouvé	1E12: Large-eddy simulations of an ethanol direct-injection spark-ignition IC engine S.J. Kazmouz, D.C. Haworth	1F12: R-152a/air and R-134a/oxygen constant volume spherical flame burning velocity measurements R.R. Burrell, M.J. Hegetschweiler, D.R. Burgess Jr., J.A. Manion, V.I. Babushok, G.T. Linteris	IG12: Aluminum particle reactivity as a function of alumina shell structure: Amorphous versus crystalline R. Walzel, M. Pantoya	1H12: Premixed ethylene-air combustion in a dual-mode scramjet cavity flameholder G.B. Goodwin, R.F. Johnson, H.K. Chelliah	1J12: Isomer- specific combustion chemistry in opposed-flow diffusion flames of allene and propyne G. Kukkadapu, N. Hansen, S.W. Wagnon, W.J. Pitz	1K12: Exploring continuous monitoring methods for SO ₃ and H ₂ SO ₄ in flue gas conditions <i>A. Biasioli, D. Dunn-Rankin, YC. Chien</i>
15:15	1A13: HÖ2 + HÖ2: High level theory and the role of singlet channels S.J. Klippenstein, R. Sivaramakrishnan, U. Burke, K.P. Somers, H.J. Curran, L. Cai, H. Pitsch, M. Pelucchi, T. Faravelli, P. Glarborg	1B13: High fidelity thermochemistry for kinetic modeling of methyl chloride combustion D. Farina, Jr., S.K. Sirumalla, D. Sotir, R.H. West		1D13: Detailed modeling of a small-scale turbulent pool fire B. Wu, X. Zhao, S. Roy	1E13: Predicting cycle-to-cycle variations in a spark-ignition engine using multi-cycle large eddy simulation Y. Su, D. Splitter, S.H. Kim	1F13: On the laminar burning speed and spherical flame structure of anisole-air premixed mixture S. Zare, S. Roy, O. Askari	1G13: Effect of polymer addition on burning rate of Pennsylvania crude G. Singh, M. Esmaeilpour, A. Ratner	1H13: Spatial dependence of energy deposition for cavity-based flame holder ignition in a scramjet <i>T. Ombrello</i>	1J13: New insights into PAH chemistry from flame-sampling high-resolution tandem mass spectrometry B.D. Adamson, S.A. Skeen, M. Ahmed, N. Hansen	1K13: Proposed criteria for MILD coal combustion H. Zhou, T.A. Ring, J.C. Sutherland

15:35 – 15:55 Break with beverages and light snacks available in the Upper and Lower Floors of the Atrium

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Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I Session Chair: P.T. Lynch	Chemical Kinetics II Session Chair: D.A. Lacoste	Turbulent Flames Session Chair: B.M. Cetegen	Fire Session Chair: Y. Wang	Engines Session Chair: D. DelVescovo	Laminar Flames Session Chair: YC. Chien	Heterogeneous Combustion Session Chair: A. Ratner	Detonations Session Chair: S.A. Coronel	Soot Session Chair: B.M. Kumfer	Coal Session Chair: J. Sutherland
15:55	1A14: A study of shock-tube facility effects over a wide range of conditions using multiple facilities S.P. Cooper, D. Nativel, M. Fikri, E.L. Petersen, C. Schulz	1B14: Autoignition of CRC diesel surrogates at low temperature combustion conditions: Rapid compression machine experiments and modeling M. Wang, G. Kukkadapu, K. Zhang, S.W. Wagnon, M. Mehl, W.J. Pitz, C.K. Westbrook, CJ. Sung	1C14: Assessment of the stabilization mechanisms of turbulent lifted jet flames at elevated pressure using 2-D Raman imaging T.F. Guiberti, W.R. Boyette, Y. Krishna, A.R. Masri, W.L. Roberts, G. Magnotti	1D14: Effect of free-stream turbulence on wind-driven fires X. Ren, X. Ju, M. Gollner	1E14: Improving numerical modeling of DISI cold-start A.C. Ravindran, S.L. Kokjohn	1F14: Self-sustaining warm nonpremixed flames in the counterflow O.R. Yehia, T. Zhang, C.B. Reuter, Y. Ju	1G14: DNS of n-heptane droplet vaporization and combustion J. Palmore Jr.	1H14: Numerical modeling of supersonic combustion in a non- premixed rotating detonation engine P. Pal, G. Kumar, S.A. Drennan, B.A. Rankin, S. Som	1J14: Soot formation and radiation heat transfer in a triaxial methane diffusion flame P.H. Irace, Z. Yang, A. Gopan, R.L. Axelbaum	1K14: Pore-resolving simulation to study the effect of morphology on char combustion S. Jorgensen, S. Singer
16:15	1A15: Quantitative measurements of CH in a shock tube using laser absorption at 427 nm C.R. Mulvihill, M.W. Crofton, D.G. Arnold, E.L. Petersen, K.Y. Lam	1B15: Oxidation of an iso-paraffinic alcohol-to-jet fuel and heptane mixture: An experimental and modelling study J. Guzman, G. Kukkadapu, K. Brezinsky, C.K. Westbrook	1C15: Statistical analysis of scalars for ignition via transient hot jet M.E. Feyz, M.R. Nalim, V.R. Hasti, J.P. Gore	1D15: A computational study on the fire merging of burning chamise shrubs M.A. Habib, C. Anand, S. Mahalingam, B. Shotorban	1E15: Numerical simulation of a controlled trajectory rapid compression and expansion machine K.C. Bavandla, A. Tripathi, Z. Sun, S. Yang	1F15: Effects of H ₂ O and CO ₂ fuel dilution on a coflow methane/air diffusion flame <i>M. Vicariotto</i> , <i>D. Dunn-Rankin</i>	1G15: An investigation of characteristics of airblast atomization using 3D DNS for altitude relight conditions A.A. Mukundan, T. Ménard, A. Berlemont, J. César, B. de Motta	1H15: Simulating multidimension al reacting flow with the discontinuous Galerkin method R.F. Johnson, A. Kercher, A. Corrigan, D. Kessler, D. Schwer, G. Goodwin	1J15: Soot concentration, temperature, and radiant emission measurements in a turbulent ethylene jet flame C.R. Shaddix, J. Zhang, T.C. Williams	1K15: Kinetic Monte-Carlo study of pitting dynamics in high-temperature graphene gasification S. Schmitt, J. Graña-Otero

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16:35	1A16: A revisit of constant temperature approximation in chemical kinetics study using single pulse shock tubes with speciation X. Han, J.M. Mehta, K. Brezinsky	1B16: An experimental and modelling study of 2,4,4 trimethyl-1-pentene N. Lokachari, K. Zhang, W.J. Pitz, H.J. Curran	1C16: Understanding the effect of nanosecond pulsed discharge on ignition and flame stability of methane jet flames S. Zare, H.W. Lo, A. El Maadi, S. Roy, K. Kim, O. Askari, F.G. del Campo	1D16: A study of intermittent convective heating effects on fine fuel ignition L. Benny, N. Chui, N. Warner, M.J. Gollner	1E16: Numerical study on direct injection of hydrogen- methane blends into a constant volume combustion chamber M. Shahsavan, M. Morovatiyan, J.H. Mack	1F16: Rateratio asymptotic analysis of the influence of addition of carbon monoxide on the structure and mechanisms of extinction of nonpremixed methane flames K. Seshadri, XS. Bai	1G16: Numerical investigation of n-dodecane spray ignition C. Zheng, B. Akih-Kumgeh	1H16: An analysis of irregular detonation phenomena using machine learning and numerical simulation K. Grogan, M. Ihme, Y. Lv	1J16: Predicting soot formation and emission in wildland fires with FIRETEC A.J. Josephson, R.R. Linn, E. Koo	1K16: A continuum model for graphene oxidation J. Graña-Otero, S. Schmitt
16:55	1A17: Multi- species time history measurements during ethanol pyrolysis behind reflected shock waves R. Choudhary, Y. Peng, J. Shao, D.F. Davidson, R.K. Hanson	1B17: Validated model for burning velocities of R-32/O2/N2 mixtures over a wide range of conditions D.R. Burgess, Jr., J.A. Manion, R.R. Burrell, V.I. Babushok, M.J. Hegetschweiler, G.T. Linteris	1C17: Ignition and flame kernel development in lean premixed H ₂ /air flowing gases S. Jo, J. Kim, J.P. Gore	1D17: Effects of fuel characteristics on spread rate and surface temperatures of smoldering duff D.A. Cowan, D.L. Blunck	IE17: Influence of the real-gas equation-of- state binary interaction coefficients on the turbulent mixing at diesel-engine high-pressure conditions D.T. Banuti, J. Bellan	1F17: The influence of ammonia on soot formation and flame characteristics in laminar ammonia/meth ane diffusion flames M.J. Montgomery, H. Kwon, Y. Xuan, C.S. McEnally, L.D. Pfefferle	IG17: Predicting drop impact on heated walls using multiphase SPH with adaptive resolution X. Yang, SC. Kong, CB.M. Kweon	1H17: Study on analog system of detonation with two step chemical reaction model Y. Sun	1J17: Soot volume fraction measurements in piloted turbulent nonpremixed flames at elevated pressures W.R. Boyette, A. Bennett, T.F. Guiberti, W.L. Roberts	1K17: Modulated thermogravimetr ic experiments on Argonne premium coal samples with combustion gas analysis S. Stuhlman, K. Kumar
17:15	1A18: The experimental pursuit of elementary reaction rates for isopropanol pyrolysis using multi-species constraint A. Mansfield, M. Burnett, S. W. Wagnon, C. Thomas, M.S. Wooldridge	1B18: Sensitivity of HyChem model accuracy to species measurement uncertainties of fuel pyrolysis R. Xu, H. Wang	1C18: Lift-off behavior of turbulent cool flames stabilized by autoignition C.B. Reuter, Y. Ju	1D18: Influence of lignin on smoldering propagation B.D. Smucker, W.J. Jayasuriya, K.E. Niemeyer, D.L. Blunck	1E18: Evaluation of combustion models for CFD simulation of pre-chamber ignition in a natural gas engine J. Kim, R. Scarcelli, S. Som, A. Shah, M.S. Biruduganti, D.E. Longman	1F18: Double blue zones in inverse and normal laminar jet diffusion flames Z. Wang, P.B. Sunderland, R.L. Axelbaum	1G18: Numerical study of drop impact on heated wall using SPH simulation Y. Pan, X. Yang, SC. Kong	1H18: Effect of boundary conditions on detonation simulations: A geometric model study J. Crane, X. Shi, H. Wang		1K18: The ozonolysis of isoprene in a cryogenic buffer gas cooling cell: A new method for branching ratios analysis J.P. Porterfield, S. Eibenberger, D. Patterson, M.C. McCarthy

18:00 – 20:00 Mentoring Mixer in Ballroom DE

Tomorrow, during breaks and transitions make sure to visit:

Combustion Artwork is displayed at the main entrance on the upper floor near the registration desk.

Voting closes Tuesday at 17:30

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Sponsors are displayed in the Atrium Lower Floor

TUESDAY, 26 March 2019

07:00 – 16:00 Registration Open – Atrium of the Convention Center (Upper and Lower Floors) 08:00 – 18:00 Combustion Artwork is displayed at the main entrance on the upper floor near the registration desk. Make sure to visit and vote before voting closes at 17:30 08:00 – 16:35 Sponsors are displayed in the Atrium Lower Floor

Work in Progress Posters (Display Set up 07:00 - 08:00, Poster Session 08:00 - 18:00) - Upper and Lower Floors of the Atrium

Room 102 - 104

07:55 Announcements: Guillaume Blanquart, The California Institute of Technology, Local Host 08:00 – 09:00 Plenary Lecture Hope Michelsen, Combustion Research Facility, Sandia National Laboratories "Soot Formation, Growth, and Global Impact: The Life Story of a Mass Murderer" Session Chair: Joaquin Camacho

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	Chemical Kinetics I Session Chair: T. Sikes	Chemical Kinetics II Session Chair: C. Yan	Turbulent Flames Session Chair: A. Konduri	Fire Session Chair: S.N. Scott	Engines Session Chair: J.S. Heyne	Laminar Flames Session Chair: A.R. Karagozian	Heterogeneous Combustion Session Chair: X. Yang	Diagnostics Session Chair: W.D. Kulatilaka	Soot Session Chair: C.R. Shaddix	Other Session Chair: P. Pepiot
09:20	2A01: Role of ozone addition in the explosion limits of hydrogenoxygen mixtures: Multiplicity and catalyticity W. Liang, Y. Wang, C.K. Law	2B01: The effects of roaming radical reactions on global combustion properties of transportation fuels <i>C.F. Goldsmith, R.H. West</i>	2C01: Flame structure analysis of the Hi-Pilot stratified premixed jet flames using large eddy simulations O.B. Shende, M. Ihme	2D01: A numerical and theoretical study of the effects of wind on the structure of a turbulent line fire S. Verma, A. Trouvé	2E01: Numerical studies on flame-wall interaction in a closed chamber H. Li	2F01: Studies of high pressure 1,3-butadiene flame speeds and high temperature kinetics using hydrogen and oxygen sensitization H. Zhao, Z. Zhang, Y. Rezgui, N. Zhao, Y. Ju	2G01: Subgrid flamelet-generated manifold using multi-scale modeling for spray combustion A. Panchal, R. Ranjan, S. Menon	2H01: High- resolution velocimetry in turbulent premixed flames using a wavelet- based optical flow technique B.E. Schmidt, A.W. Skiba, J.F. Driscoll, S.D. Hammack, C.D. Carter, J.A. Sutton	2J01: Sooting tendencies of ethylene in a shock tube S. Barak, S. Neupane, E. Ninnemann, R. Rahman, A. Laich, S. Vasu	2K01: A review of evidence-based best practices for developing research software in combustion K.E. Niemeyer, R.L. Speth, B.W. Weber, R.H. West
09:40	2A02: Investigation of ethylene ozonolysis reaction in a flow reactor by VUV-photo- ionization mass spectrometry B. Wu, X. Wu, J. Yang, F. Zhang, W. Sun	2B02: Development of a new chemical mechanism for ethanol-air mixture in a wide range of temperature and pressure S. Roy, S. Zare, O. Askari	2C02: Getting the full picture: Extension of NGA to fully compressible reacting flows G. Beardsell, S. Lapointe, G. Blanquart	2D02: Numerical investigation of gypsum thermo- chemistry under fire exposure S.P. Kozhumal, W.D. Hicks, H. Sezer	2E02: Quantifying facility effects for the interpretation of optical engine data M.A. Groendyk, D.A. Rothamer, J.E. Temme, Cb.M. Kweon	2F02: Laminar flame propagation in mixtures with non-zero reaction progress H. Lin, P. Zhao	2G02: The influence of droplet injection models on Reynolds averaged Navier-Stokes simulations of high-speed heptane/ethane spray flames D.A. Kessler, B.T. Fisher, A.D. Tuesta, S.G. Tuttle, C.J. Pfützner	2H02: Multi- isotope spectroscopy of CO for shock tube oxidation studies of fuel blends D.I. Pineda, F.A. Bendana, K.K. Schwarm, R.M. Spearrin	2J02: Evolution of sp ² carbon bonding on nanoparticles formed in premixed stagnation flames at elevated temperature and equivalence ratio S. Dasappa, J. Camacho	2K02: Open source CFD for reacting flow simulation: An upgraded OpenFOAM platform Q. Yang, P. Zhao, H. Ge

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10:00	2A03: Insights into the reactions of hydroxyl radical with diolefins F. Khaled, B.R. Giri, D. Liu, E. Assaf, C. Fittschen, A. Farooq	2B03: Towards a high-accuracy kinetic database informed by theoretical and experimental data C.E. LaGrotta, M.C. Barbet, L. Lei, M.P. Burke	2C03: Time-efficient methods for real fluid property evaluation in numerical simulation of chemically reacting flows P.J. Milan, Y. Li, X. Wang, S. Yang, W. Sun, V. Yang	2D03: Numerical modeling of soot-radiation in optically-thin, buoyant diffusion flames of varying oxygen index P. Chatterjee, K.V. Meredith, Y. Wang	2E03: Analysis of transient thermoacoustic oscillations in a liquid fueled gas turbine combustor at elevated pressures T.M. Wabel, S. Yang, M. Passarelli, J.D.M. Cirtwill, P. Saini, K. Venkatesan, A.M. Steinberg	2F03: Experimental investigations of laminar flame propagation of C1-C4/O2/inert mixtures at engine-relevant conditions A. Movaghar, R. Lawson, F.N. Egolfopoulos	2G03: Modeling disruptive burning in multicompo- nent droplets T. Yau, M. Ihme	2H03: Hyperspectral absorption tomography with a lineshape prior S.J. Grauer, J. Emmert, A.M. Steinberg, S. Wagner, K.J. Daun	2J03: Soot precursor formation from oxygenated aromatics: How oxygen functionality alters organic reaction pathways S. Kim, G.M. Fioroni, B.D. Etz, P.C. St. John, M. Nimlos, T. Foust, C.S. McEnally, L.D. Pfefferle, Y. Xuan, R.S. Paton, R.L. McCormick	2K03: Molecular level combustion simulations using the DSMC method S. Trivedi, R.S. Cant, J.K. Harvey
10:20	2A04: Low temperature oxidation of ethylene by ozone in a jet- stirred reactor A.C. Rousso, N. Hansen, A.W. Jasper, Y. Ju	2B04: A chemical functionality approach towards the formulation of a high-fidelity surrogate fuel for FACE gasoline F A.D. Ure, S. Dooley, D. Kang, S.S. Goldsborough	2C04: An overview of multi-physics modeling considerations for turbulent jet flames with inhomogeneous inlets B.A. Perry, M.E. Mueller	2D04: Numerical study of fire behavior between two inclined panels Q. Li, YT.T. Liao	2E04: Flame- wall fuel film interaction under engine thermodynamic conditions M. Tao, P. Zhao	2F04: Effects of radiation on laminar flame propagation in H ₂ /O ₂ /N ₂ mixtures at elevated pressures <i>S. Zheng, W. Liang, Z. Chen</i>		2H04: X-ray excitation of thermographic phosphors E.R. Westphal, S.F. Son, E. Quintana, K.N.G. Hoffmeister	2J04: In situ imaging studies of combustor pressure effects on soot oxidation A.D. Sediako, A. Bennett, W.L. Roberts, M.J. Thomson	2K04: A numerical investigation of quenched laser- ignited CH ₄ and biogas mixtures near the lean flammability limit D. Coombs, N. Peters, B. Akih-Kumgeh

10:40 - 11:05 Break with beverages and light snacks available in the Upper and Lower Floors of the Atrium

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11:05	2A05: An experimental and modeling study of autoignition for cyclopentane and dimethyl ether binary blends S.W. Wagnon, N. Lokachari, G. Kukkadapu, H.J. Curran, W.J. Pitz	2B05: A population dynamics model for expanding turbulent flames V.R. Unni, A. Saha	2C05: A comparative study of hydrodynamic effects in turbulent premixed jet flames L. Paxton, C. Wei, D.I. Pineda, S. Luna, R.M. Spearrin, F. Egolfopoulos	2D05: Laboratory scale testing of Nomex fabric as a protective flame barrier in enriched oxygen atmospheres W. Shang, M.C. Johnston, J. Capetillo, J.S. T'ien	2E05: Flame position-shear layer offset effects on reacting jet in cross-flow dynamics V. Nair, O. Klempay, V. Acharya, T. Lieuwen	2F05: Studies of multi-channel spark ignition characteristics of n-pentane/air mixture under fuel lean conditions in a spherical bomb H. Zhao, N. Zhao, T. Zhang, G. Ma, C. Yan, H. Zhong, Y. Ju	2G05: Investigating the role of atomization on flame stability of liquid fuels in spray burner R.A. Alsulami, B. Windell, S. Nates, W. Wang, S.H. Won, B. Windom	2H05: Dual-pump coherent anti-Stokes Raman scattering spectroscopy in a turbulent heptane/ethane spray flame A.D. Tuesta, B.T. Fisher, S.G. Tuttle, D.A. Kessler	2J05: Effect of equivalence ratio and temperature on soot formation in partially premixed counterflow flames K. Gleason, F. Carbone, A. Gomez	2K05: Experimental and theoretical study of cyclopentanone as a catalyst for low temperature alkene oxidation E.D. Christensen, S. Kim, G. Fioroni, R.S. Paton, R.L. McCormick
11:25	2A06: Understanding siloxane combustion chemistry: Computational and experimental studies of hexamethyldisi loxane R.A. Schwind, M.S. Wooldridge, R. Sivaramakrishnan	2B06: Machine learning based models for joint PDF shapes for multi-scalar mixing in turbulent flows S. Yellapantula, B.A. Perry, M.T.H. de Frahan, M.E. Mueller, R. Grout	2C06: Unique identification of turbulent reacting system dynamics with time-lag phase portraits T.P. Gallagher, R. Martin, V. Sankaran	2D06: Simultaneous measurement of fuel transport and foam degradation for firefighting foams to improve understanding of fire suppressing mechanisms K. Hinnant, A. Snow, S. Giles, J. Fleming, J.H. Miller, R. Ananth	2E06: Jet development and penetration of a multihole diesel injector in a constant volume, low temperature chamber A. Loper, E. Bogdanowicz, J. Bittle, A.K. Agrawal	2F06: Application and refinement of scaling analyses for mild ignition J. Santner, S.S. Goldsborough	2G06: Investigating the role of preferential vaporization during submillimeter sized multicomponent jet fuel surrogate droplet combustion T. Farouk, S.H. Won, F. Dryer	2H06: High- speed OH* and CH* chemi- luminescence imaging diagnostics in spherically expanding laminar and turbulent flames P. Parajuli, T.T. Paschal, M.A. Turner, E.L. Petersen, W.D. Kulatilaka	2J06: An investigation of soot evolution in high-pressure spray combustion <i>K.M. Mukut, S. Roy</i>	2K06: Combustion assisted fabrication of paper-templated metal structures M. Morovatiyan, A. Mohapatra, M. Shahsavan, A. Kazi, D.C. Christodouleas, J.H. Mack

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	Chemical Kinetics I Session Chair: CJ. Sung	Turbulent Flames I Session Chair: D. Dasgupta	Turbulent Flames II Session Chair: K.P. Grogan	Fire Session Chair: M. Thomsen	Engines Session Chair: S. Biswas	Laminar Flames Session Chair: X. Shi	Heterogeneous Combustion Session Chair: B.D. Shaw	Diagnostics Session Chair: B.E. Schmidt	Soot Session Chair: Y. Xuan	Other Session Chair: K. Whitty
11:45	2A07: Performance comparison of chemical kinetic models for toluene autoignition M.A. Mayer, K.E. Niemeyer	2B07: A neural network-based flamelet model for a liquid propellant rocket engine with partially-premixed flame Z. Shadram, T.M. Nguyen, A. Sideris, W.A. Sirignano	2C07: Analysis on turbulent flow dynamics of a practical direct-injection swirler for gaseous fuel M. Ghulam, Y. Shen, R.V. Gomez, E. Gutmark, C. Duwig	2D07: Fuel effects on pool fire extinction by aqueous foams R. Ananth, S. Giles, K. Hinnant, A. Snow, J. Fleming, J. Farley	2E07: Effect of fuel properties on spray and combustion characteristics under compression ignition engine conditions L. Zhao, M.M. Ameen, Y. Pei, Y. Zhang, M.L. Traver, J.M. García-Oliver, W. Vera-Tudela	2F07: Influence of diluent gas on ignition in premixed methane-air-diluent mixtures V.R. Katta, J.M. Bonebrake, D.L. Blunck, T.M. Ombrello	2G07: Modifying continuous thermodynamics droplet vaporization models to predict functional group fluxes S. Singer	2H07: Diluent effect on combustion within a rapid compression machine O. Samimi-Abianeh, J.A. Piehl, A. Zyada, M. Al-Sadoon, L. Bravo	2J07: Soot formation models for non-premixed flames with variable stoichiometric mixture fraction and strain P.R. Johnson, R.K. Chakrabarty, B.M. Kumfer	2K07: Fabrication of binary manganese oxide - carbon films by flame assisted deposition with tuned metal oxidation and carbon sp ² bonding A. Aleshin, W. Wood, S. Dasappa, J. Camacho
12:05	2A08: High- pressure ignition delay measurements of methane under highly diluted carbon dioxide and argon conditions M. Karimi, B. Ochs, D. Ranjan, W. Sun	2B08: Validation of a low Mach fire environment model with vertical porous burner experiments A.J. Kurzawski, S.N. Scott, J.C. Hewson	2C08: Local statistics of expanding turbulent flames: Effect of Darrieus-Landau instability Z. Liu, A. Saha, S. Chaudhuri, C.K. Law	2D08: Performance characterization of biomass- fueled camp stoves J. Endara, W. Stone, H, Sezer		2F08: Using confined spherically expanding flames to study autoignition of reacting mixtures V. Gururajan, R. Lawson, A. Movaghar, F.N. Egolfopoulos	2G08: High-speed imaging of spray near-field behavior in a turbulent heptane/ethane spray flame B.T. Fisher, S.G. Tuttle, A.D. Tuesta, R.J. Jacob, D.A. Kessler, C.J. Pfützner	2H08: Single-shot, OH Planar Laser-Induced Fluorescence (PLIF) studies of spherically expanding laminar flames T.T. Paschal, M.A. Turner, P. Parajuli, Y. Wang, E.L. Petersen, W.D. Kulatilaka	2J08: A physics-based approach to modeling soot formation from real jet fuel combustion C. Saggese, R. Xu, H. Wang	2K08: Formation mechanisms of Ni-rich LiNi _{1-x-} yMn _x Co _y O ₂ battery cathode materials in flame aerosol synthesis C. Abram, J. Shan, X. Yang, C. Yan, D. Steingart, Y. Ju

 $12:25-13:40\ Lunch\ on\ your\ own.$ Explore The Paseo and take advantage of the restaurants and open-air shopping just outside the Pasadena Convention Center

12:25 – 13:40 Women in Combustion Luncheon: Room 211 12:40 – 13:40 Learn about career opportunities at the Exponent Info Session in Room 212/214
12:25 – 13:40 USSCI Board Meeting in Room 205

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210	Room 105
	Chemical Kinetics I Session Chair: S.S. Goldsborough	Chemical Kinetics II Session Chair: M.S. Wooldridge	Turbulent Flames Session Chair: D. Lignell	Fire Session Chair: S. McAllister	Engines Session Chair: C. Hagen	Laminar Flames Session Chair: O. Askari	Hetero- geneous Combustion Session Chair: A.R. Demko	Diagnostics Session Chair: J.A. Sutton	Stationary Combustion Systems Session Chair: B. Windom	Coal Session Chair: Z. Yang	Lam Memorial Session Session Chair: C.K. Law
13:40	2A09: Shock tube ignition study of prenol – a "hyperboosting" fuel relevant to the co-optima initiative A.R. Laich, E. Ninnemann, S. Neupane, K. Thurmond, S. Wagnon, W.J. Pitz, S.S. Vasu	2B09: Dynamic evaluation of multi- component pressure dependence in multi- channel reactions: A case study of CH ₃ +OH system L Lei, M.P. Burke	2C09: Direct numerical simulation of an autoignitive turbulent flame in a stratified dimethylether (DME)/air mixture S. Desai, R. Sankaran, H.G. Im	2D09: Downward burning of PMMA cylinders in spacecraft environment s M. Thomsen, C. Fernandez- Pello, X. Huang, S.L. Olson, P.V. Ferkul	2E09: Analysis of ignition and stabilization modes in diesel spray flames using large eddy simulations and chemical explosive mode analysis C. Xu, M. Ameen, P. Kundu, T. Lu, S. Som	2F09: Temperature, species, and laminar flame speed measurements in high- temperature, premixed ethane-air flames A.M. Ferris, J.J. Girard, A.J. Susa, D.F. Davidson, R.K. Hanson	2G09: Veryhigh-pressure burning rates of aluminized and non-aluminized AP/HTPB-composite propellants C.A.M. Dillier, T. Sammet, F.A. Rodriguez, E.D. Petersen, J.C. Thomas, E.L. Petersen	2H09: Characterizatio n of dust particle flow field in minimum ignition energy testing apparatus using high-speed digital in-line holography C. Schweizer, A. Saini, D. Guildenbecher, C. Mashuga, W. Kulatilaka	2J09: Incorporation of coal kinetics into a dual circulating fluidized bed reactor burning coal by chemical looping with oxygen uncoupling Z. Reinking, HS. Shim, K. Whitty, J. Lighty	2K09: Comparison of flame temperature, water mole fraction and mass flux for wildland fire fuels A.S. Makowiecki, J.E. Steinbrenner, N.T. Wimer, C.B. Lapointe, J.F. Glusman, J.W. Daily, P.E. Hamlington, G.B. Rieker	LAM1: CSP and local sensitivity analysis EA. Tingas, D.A. Goussis
14:00	2A10: Intermediate species measurement s during sarin simulants combustion inside a shock tube S. Neupane, R. Rahman, S. Barak, E. Ninnemann, A.E. Masunov, S.S. Vasu	2B10: Pressure dependent kinetics of the reaction between CH ₃ O ₂ and OH: Triox formation C. Yan, L.N. Krasnoperov	2C10: DNS analysis of flame propagation at different turbulence length scales S. Trivedi, G.V. Nivarti, R.S. Cant	2D10: Opposed flame spread over thick PMMA fuel samples in the narrow channel apparatus (simulated microgravity) S. Hossain, I.S. Wichman, S.L. Olson, F.J. Miller	2E10: Fuel vlend ratio effects on ignition and early Stage soot formation J.E. Temme, S. Busch, V.D. Coburn, Cb.M. Kweon	2F10: Laminar vurning speed of isobutane/air/c arbon dioxide mixtures at various pressures and temperatures S.C. Yelishala, Z. Wang, Z. Lu, H. Metghalchi, Y.A. Levendis	2G10: Burning rate characterizati on of guanidine nitrate and basic copper nitrate propellants with metal oxide additives A.J. Tykol, F.A. Rodriguez, J.C. Thomas, E.L. Petersen	2H10: Assessment of imaging diagnostics for measurement of lift-off length in diesel flames. B. Yraguen, F. Poursadegh, C.L. Genzale	2J10: A numerical study of confined turbulent jets for high- temperature homogeneous combustion with oxygen enrichment for industrial applications K. Aanjaneya, W. Cao, C. Borgnakke, A. Atreya	2K10: The role of chemical structure in the thermal decomposition of xylan A.D. Ure, K. Dussan, A. O'Brien, S. Dooley	LAM2: Using global pathway analysis to understand complex chemical kinetics W. Sun

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14:20	2A11: Optimization of shock tube performance in the reaction region at high temperatures and pressures J.M. Mehta, K. Brezinsky	2B11: Reaction kinetics of chemically termolecular reactions: Pressure dependence L. Lei, M.P. Burke	2C11: DNS of multi- injection mixing and combustion at compression ignition engine conditions M. Rieth, M. Day, CB. Kweon, J.B. Bell, J.H. Chen	2D11: Radiation measurements of turbulent wall fire – Apparatus design and preliminary results D. Zeng, G. Xiong, G. Agarwal, Y. Wang	2E11: Effect of CO ₂ dilution on the ignition and developme nt of CH ₄ /air ignition kernels J.M. Bonebrake, T.M. Ombrello, D.L. Blunck	2F11: An experimental and modeling study of laminar flame speeds for isopropyl-nitrate. C.F. Goldsmith, M.E. Fuller, N. Chaumeix	2G11: Synchrotron based measurement of the temperature dependent thermal expansion coefficient of ammonium perchlorate R. Kellogg, S. Lapidus, T. Hedman, J. Kalman	2H11: Quantifying the influence of camera sensor and optics on multispectral image-based thin-filament pyrometry V.M. Sauer, S.N.R. Isfahani, I. Schoegl	2J11: Combustion performance of storage water heaters operated on mixtures of natural and renewable gas S. Choudhury, Y. Zhao, V.G. McDonell	2K11: Connecting burning rate and flame spread rate in opposed-flow flame spread over flat fuel beds L. Carmignani, O. Kaskir, E. Tagger, S. Bhattacharjee	LAM3: Toward Computationa 1 Singular Perturbation (CSP) without eigen- decompositio n P. Zhao, S.H. Lam
14:40	2A12: A diaphragmles s, fire-by-wire shock tube for high-temperature and low-pressure kinetics M.E. Fuller, M. Skowron, R.S. Tranter, C.F. Goldsmith	2B12: Screening for structural uncertainties from third- body collision efficiencies M.C. Barbet, M.P. Burke	2C12: DNS of a turbulent premixed flame stabilized over a backward facing step K. Aditya, H. Kolla, J.H. Chen	2D12: Structure and stability of an inclined laminar flame R.S.P. Hakes, W. Coenen, A.L. Sánchez, M.J. Gollner, F.A. Williams	2E12: Transient plasma ignition of lean and dilute propane/air mixtures S. Biswas, I. Ekoto, R. Scarcelli	2F12: R- 152a/air and R- 134a/oxygen constant volume spherical flame burning velocity measurements R.R. Burrell, M.J. Hegetschweiler, D.R. Burgess Jr., J.A. Manion, V.I. Babushok, G.T. Linteris	2G12: Low temperature decomposition of ammonium perchlorate in the presence of catalyst E. Tolmachoff, T. Hedman, J. Essel, S. Kalman, J. Kalman	2H12: 2-kHz laser absorption imaging of ethane in unsteady partially premixed flames K.K. Schwarm, C. Wei, D.I. Pineda, R.M. Spearrin	2J12: Evaluation of a low cost, real- time gaseous fuel composition sensor A.K. Li, V. McDonell	2K12: On the oxidative torrefaction of corn straw E. Rokni, R. Yang, X. Ren, Y.A. Levendis	LAM4: Theory of combustion of normal-alkane droplets supported by cool-flame chemistry F.A. Williams, V. Nayagam

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15:00	2A13: A shock tube kinetic study on the reaction of OH + cyclopentano ne and OH + cyclohexanon e D. Liu, B.R. Giri, A. Farooq	2B13: The role of mixture rules in experimental interpretations of third-body efficiencies M.P. Burke, L. Lei	2C13: DNS of premixed flames under different turbulent conditions C. Dhandapani, G. Blanquart	2D13: Comprehens ive analysis of dynamics and hazards associated with cascading failure in lithium ion cell arrays A.O. Said, C. Lee, S.I. Stoliarov	2E13: Investigation of fuel property effects on knock propensity in a Direct- Injection Spark- Ignition (DISI) engine Z. Yue, S. Som	2F13: Laminar flame speed measurements from OH* chemiluminesc ence of spherically expanding CH4-O2-CO2 flames M.A. Turner, T. Paschal, W.D. Kulatilaka, E.L. Petersen	2G13: Microscopic imaging of 3D printed nano-aluminum PVDF composite propellants R.J. Jacob, H. Wang, M.R. Zachariah	2H13: Identification of phase boundaries in diesel-like fuel sprays by rainbow Schlieren deflectometry C.T. Wanstall, J. Bittle, A.K. Agrawal	2J13: Experimental assessment of the combustion performance of an oven burner operated on pipeline natural gas mixed with hydrogen Y. Zhao, V. McDonell, S. Samuelsen	2K13: Oxy- combustion vehavior of torrefied biomass particles A. Panahi, N. Toole, Y. Yang, X. Wang, M. Schiemann, Y.A. Levendis	LAM5: Propagation speeds and kinetic analysis of premixed heptane/air cool and warm flames at large ignition Damköhler numbers T. Zhang, Y. Ju
15:20	2A14: Time-resolved speciation of iso-octane first-stage ignition products at elevated effective pressures in a shock tube A.J. Susa, S. Wang, D.F. Davidson, RK. Hanson	2B14: Are termolecular reactions facile in radical recombinations? A.W. Jasper, R. Sivaramakrishn an, S.J. Klippenstein	2C14: Required transition zone size in hybrid LES- DNS for the study of premixed turbulence- chemistry interactions C.A.Z. Towery, X. Gao, S.M. Guzik, S. Walters, P.E. Hamlington	2D14: Analytical study of a burning accident in an obstructed coalmining passage F. Kodakoglu, V. Akkerman	2E14: Preignition and knock limits on utilization of ethanol in octane—on—demand concept E. Singh, K. Morganti, R. Dibble	2F14: Laminar burning velocities of prenol – a "hyperboosting " fuel relevant to the Co- Optima initiative G. Kim, S. Park, A.C. Terracciano, B. Almansour, S. Wagnon, W.J. Pitz, S. Vasu	2G14: Burning rate and flame structure of cocrystals of CL-20 and a polycrystallin e composite crystal of HMX/AP M.D. Ruesch, M.S. Powell, A. Satija, R.P. Lucht, S.F. Son	2H14: Mid- infrared laser- absorption imaging of temperature and CO in laminar flames R.J. Tancin, R.M. Spearrin, C.S. Goldenstein	2J14: An emission-free closed-loop carbon dioxide power cycle S.M. Sarathy, S.Y. Mohamed, E. Singh, V.S.B. Shankar	2K14: Pyrolysis and combustion of raw and torrefied biomass A. Panahi, Y. Yang, M. Schiemann, Y.A. Levendis	LAM6: Tangential stretching rate: Theory and application in the diagnostics of turbulent flames W. Song, EA. Tingas, H.G. Im, P.P. Ciottoli, R.M. Galassi, M. Valorani

15:40 – 16:00 Break with beverages and light snacks available in the Upper and Lower Floors of the Atrium

During breaks and transitions make sure to visit:

Combustion Artwork is displayed at the main entrance on the upper floor near the registration desk.

Voting closes today at 17:30

Winners will be announced Tuesday night at the Banquet

Sponsors are displayed in the Atrium Lower Floor

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I Session Chair: M.P. Burke	Turbulent Flames I Session Chair: D.I. Pineda	Turbulent Flames II Session Chair: R. Sankaran	Fire Session Chair: M.J. Gollner	Engines Session Chair: J. Kim	Laminar Flames Session Chair: R.L. Axelbaum	Heterogeneous Combustion Session Chair: J. Kalman	Diagnostics Session Chair: S.J. Grauer	Micro- Combustion/ New Concepts Session Chair: M.E. Baumgardner	
16:00	2A15: Autoignition of CRC diesel surrogates at low temperature combustion conditions: Rapid compression machine experiments and modeling M. Wang, G. Kukkadapu, K. Zhang, S.W. Wagnon, M. Mehl, W.J. Pitz, C.K. Westbrook, CJ. Sung	2B15: Dynamics of scalar isosurfaces in isotropic turbulence T. John, V. Acharya, T. Lieuwen	2C15: Ignition and flame propagation in a supersonic cavity E. Hassan, T. Ombrello, D.M. Peterson	2D15: Forced convection fire spread along wooden dowel array G. Di Cristina, S. Kozhumal, A. Simeoni, N. Skowronski, A. Rangwala, Sk. Im	2E15: Emissions formation in a heavy-duty compression- ignited engine converted to natural gas spark-ignited operation J. Liu, C.E. Dumitrescu	2F15: Experimental and numerical investigation of n-heptane cool flame structures and propagation speeds at sub- atmospheric pressures M. Hajilou, M.Q. Brown, M.C. Brown, E. Belmont	2G15: Aging effects on the pyrolysis rate of polymeric binders and fuels A.R. Demko, T.D. Hedman, C.N. Dennis	2H15: Evolution of the OH relative concentration during flame quenching in a rectangular cross section channel A.M. Mahuthannan, P. Liu, J. Damazo, E. Kwon, D.A. Lacoste, W.L. Roberts	2J15: Numerical investigation of ignition characteristics of selected fuel blends in a micro reactor D. Akinpelu, I. Schoegl	
16:20	2A16: A chemical pathway description of low-temperature propane ignition kinetics S. Bai, R. Sivaramakrishnan, M.J. Davis, R.T. Skodje	2B16: Topologically conditioned chemical flame structure for turbulent lean premixed flames D. Dasgupta	2C16: Investigating pulse combustion effects on the anode baking furnace energy consumption and emissions characteristics A.R. Tajik, T. Shamim, A. Ghoniem, R.K.A. Al-Rub	2D16: An experimental study on the effects of ullage on flame spread through wooden matchstick arrays S.K. Lakkundi, V.M. Kimmerly, A.S. Rangwala	2E16: Comprehensive emissions from a spark-ignited gasoline engine under transient load profiles D. Wilson, D. Lehmier, C. Allen	2F16: Numerical simulations of laminar nonpremixed CH4-air jet flames influenced by varying electric fields C-F. Lopez- Camara, M. Belhi, H.G. Im, D. Dunn-Rankin	2G16: Direct writing of 90-weight percent nanothermite loading ink with a hybrid polymer H. Wang, J. Shen, D.J. Kline, N. Eckman, N.R. Agrawal, T. Wu, P. Wang, M.R. Zachariah	2H16: Exploiting line mixing effects for laser absorption spectroscopy at extreme combustion conditions D.D. Lee, F.A. Bendana, R.M. Spearrin	2J16: Low temperature soot regime of propane in a micro flow reactor with controlled temperature profile A.H. Khalid, R.J. Milcarek, H. Nakamura, K. Maruta, J. Ahn	

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16:40	2A17: An analysis of a new thermal-chemical mechanism for plasma combustion instability in plasma assisted ignition H. Zhong, M. Shneider, S. Wu, Y. Ju	2B17: Correlation between integral length scale and unburned pocket formation in CH4/air premixed turbulent flames J. Kim, R. Roncancio, A. Satija, R.P. Lucht, J.P. Gore	2C17: Direct numerical simulation of high-pressure mixing in turbulent jets N. Sharan, J. Bellan	2D17: Upward flame spread over discrete thin fuels W. Cui, YT.T. Liao	2E17: Effect of Mach number and low residence time on the NOx emissions produced by a staged gas turbine model combustor N.S. Rodrigues, T. Busari, W.C.B. Senior, Y.T. Chen, A.J. North, W.R. Laster, S.E. Meyer, R.P. Lucht	2F17: Experimental study on the influence of gravity on highly diluted and sooting coflow flames J. Tinajero, D. Giassi, D. Stocker, M. Long	2G17: Analysis of the combustion behavior of 3D-printed aluminum/PV DF gased energetic laminates M.C. Rehwoldt, H. Wang, D. Kline, N.R. Agrawal, M.R. Zachariah	2H17: Modeling a micro-reactor with transonic regions J.F. Glusman, C. Rogers, C.B. Lapointe, N. Labbe, G.B. Ellison, P. Hamlington, J.W. Daily	2J17: Thermodynamic analysis of combustible systems for power generation in deep space missions S. Cordova, S.C. Jones, JP. Fleurial, E.J. Brandon, E. Shafirovich	
17:00	2A18: Kinetics study of ethanol oxidation behind reflected shock waves: Ignition delay times, H ₂ O measurements, and detailed kinetics model comparisons T.M. Atherley, L.T. Pinzón, O. Mathieu, C.R. Mulvihill, I. Schoegl, E.L. Petersen	2B18: On the role of scale separation in the enhancement of burning rates in turbulent premixed flames T. Kulkarni, R. Buttay, M.H. Kasbaoui, A. Attili, F. Bisetti		2D18: Effect of flow velocity on flame spread along insulated electrical wires L. Gagnon, J.L. Urban, Y. Lu, C. Fernandez-Pello, V.P. Carey, Y. Konno, O. Fujita	2E18: Novel automotive emission reduction and power generation through solid oxide fuel cells T.S. Welles, J. Ahn	2F18: Ion current and flame changes with electric fields in microgravity YC. Chien, J. Tinajero, D. Stocker, U. Hegde, D. Dunn-Rankin	2G18: Experimental assessment of HTPB/Paraffin fuel blends for hybrid rocket applications J.C. Thomas, J.M. Stahl, A.J. Tykol, F.A. Rodriguez, E.L. Petersen	2H18: Examination of the suitability of thermal boundary layer analysis for boundary layer growth in a miniature shock tube R.A. Shaik, A.L. Kastengren, P.T. Lynch	2J18: Flame propagation of dual-pulse laser-induced breakdown in a premixed methane-air flow L. Wermer, J.K. Lefkowitz, T. Ombrello, S. Im	

18:30 – 22:30 Banquet under the Space Shuttle Endeavour at the California Science Center First bus will leave the Pasadena Convention Center for the California Science Center by 17:45

Buses will depart from the Green Street entrance

Buses will begin to return from the California Science Center to the Pasadena Convention Center starting at 21:00 and the last will depart at 22:45

WEDNESDAY, 27 March 2019

08:00 – 12:00 Sponsors are displayed in the Atrium Lower Floor

Room 102 - 104

07:55 Announcements: Guillaume Blanquart, The California Institute of Technology, Local Host

08:00 – 09:00 Plenary Lecture Dr. Greg Rieker, University of Colorado Boulder

Session Chair: Anthony Marchese

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I Session Chair:	Turbulent Flames I Session Chair: A. Saha	Turbulent Flames II Session Chair: F. Bisetti	Fire Session Chair: D. Zeng	Engines Session Chair: D.A. Rothamer	Laminar Flames Session Chair: E.L. Belmont	Heterogeneous Combustion Session Chair: H. Wang	Diagnostics Session Chair: R.M. Spearrin	Micro- Combustion/ New Concepts Session Chair: R.J. Milcarek	Other Session Chair: T. Holland
09:20	3A01: Effects of pulsating flow field on NO and radially-inhomogeneous NO ₂ distribution in a multidimensional numerical investigation of McKennadriven flow tube configuration <i>S.F. Ahmed, A. Charchi, F.L. Dryer, T.I. Farouk</i>	3B01: Application of the Damköhler In-Situ Targeted Adaptive Numerical Thermochemist ry (DISTANT) finite-rate chemistry model to combusting and dissociating hypersonic flows Z.A. LaBry, K.P. Grogan	3C01: Experimental assessment of the stability and structure of turbulent premixed bluff- body stabilized flames at elevated pressures A.W. Skiba, T.F. Guiberti, W.R. Boyette, W.L. Roberts, E. Mastorakos	3D01: Flame propagation in mixtures of moist O ₂ /N ₂ Oxidizer with fluorinated propene refrigerants (CF ₃ CFCH ₂ , CF ₃ CHCHF, and CF ₃ CHCH ₂) <i>V.I. Babushok, M.J. Hegetschweiler, G.T. Linteris</i>	3E01: Detailed soot modeling of mixing controlled compression ignition engines T. Strickland, S.L. Kokjohn	3F01: Propagation and extinction of premixed H2-O2-N2 edge-flames in a counter-flow burner Z. Zhou, G.N. Narayanam, J.T. Weiss, P.D. Ronney	3G01: Experiments and analysis of n-heptane/iso- butanol mixture droplet combustion A. Dalili, M. Turello, F. Pizzetti, J.D. Brunson, C.T. Avedisian, K. Seshadri, S. Guo, A. Cuoci, P. Dou, F.A. Williams, A. Frassoldati, M.C. Hicks	3H01: Rayleigh scattering mixing rate diagnostic technique for enclosed burners J.W. Dayton, B. Poettgen, B.M. Cetegen	3J01: Enabling tailored porous media burners via additive manufacturing S. Sobhani, P. Muhunthan, D. Mohaddes, E. Boigne, Z. Cheng, M. Ihme	3K01: Low temperature oxidation of methylpropyl ether M.R. Nimlos, L. Bu, M.S. Johnson, D. Kang, G.M. Fioroni, R.L. McCormick, S. Kim, T.D. Foust, S.S. Goldsborough, W.H. Green

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I Session Chair:	Turbulent Flames I Session Chair: A. Saha	Turbulent Flames II Session Chair: F. Bisetti	Fire Session Chair: D. Zeng	Engines Session Chair: D.A. Rothamer	Laminar Flames Session Chair: E.L. Belmont	Heterogeneous Combustion Session Chair: H. Wang	Diagnostics Session Chair: R.M. Spearrin	Micro- Combustion/ New Concepts Session Chair: R.J. Milcarek	Other Session Chair: T. Holland
09:40	3A02: Experimental measurements and kinetic modeling of NOx formation for synthetic natural gas combustion under gas turbine relevant conditions S.F. Ahmed, F.E. Alam, F.L. Dryer, T.I. Farouk	3B02: Assessment of conditional source-term estimation for high pressure turbulent combustion modeling C. Devaud, W.K. Bushe, J. Bellan	3C02: Flame stabilization behavior of a heated reacting premixed jet in a hot vitiated crossflow J.W. Dayton, B. Poettgen, B.M. Cetegen	3D02: A comparative study of moisture evaporation models in the drying and pyrolysis of moist solid fuels <i>P.R. Borujerdi, B. Shotorban, S. Mahalingam, D.R. Weise</i>	3E02: Modeling prespark heat release and low temperature chemistry of iso-octane in a boosted spark- ignition engine D. DelVescovo, D. Splitter, J. Szybist	3F02: Numerical study of unsteady negative edge flames in a periodic flow S.W. Grib, M.W. Renfro	3G02: Evaluation of free-floating droplet acceleration in ISS droplet combustion experiments C.L. Vang, B.D. Shaw	3H02: Filtered Rayleigh scattering of cellular flames in tubular burner C.D. Carpenter, R.W. Pitz	3J02: Effects of dilution and pressure on combustion characteristics within externally heated microchannels S.N.R. Isfahani, V.M. Sauer, I.M. Schoegl	3K02: Investigation of combustion behavior of a hot air balloon burner C. Hernandez, F. Albalawi, C. Vuong, M. Tanaka, YC. Chien, D. Dunn-Rankin
10:00	3A03: Branching ratio of N ₂ O + O → Products determined from flow reactor experiments at intermediate temperatures F.M. Haas, F.E. Alam, J.S. Santner, T.I. Farouk, F.L. Dryer	3B03: Assessment of enthalpy-based conditional moment closure models in predicting ignition of lean and stoichiometric PRF-air mixtures with temperature inhomogeneity W. Wang, S.H. Kim	3C03: Analysis of blow-out mechanisms of turbulent swirl-stabilized non-premixed flames D. Li, T. Jaravel, M. Ihme	3D03: Modeling flame merging behavior of two buoyant flames as a function of horizontal and vertical separation distance F. Cannon, T.H. Fletcher, C. Shen	3E03: NMR spectroscopy for the analysis of real fuels: A case study of FACE gasoline F A.D. Ure, J.E. O'Brien, S. Dooley	3F03: Impact of the Lewis number on flame acceleration at the early stage of burning in pipes O. Abidakun, M. Alkhabbaz, D. Valiev, V. Akkerman	3G03: Theory of combustion of normal-alkane droplets supported by cool-flame chemistry F.A. Williams, V. Nayagam	3H03: Filtered Rayleigh scattering thermometry in highly turbulent premixed flames I.T. Monje, J.A. Sutton	3J03: Ignition and self-sustained catalytic combustion of methane oxygen mixtures in a platinum microtube S. Stuhlman, E. Al-Gharibeh, S. Beyerlein, K. Kumar	3K03: Flame characteristics of cryogenic hydrogen releases from high-aspect ratio nozzles B.R. Chowdhury, E.S. Hecht

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	Chemical Kinetics I Session Chair:	Turbulent Flames I Session Chair: A. Saha	Turbulent Flames II Session Chair: F. Bisetti	Fire Session Chair: D. Zeng	Engines Session Chair: D.A. Rothamer	Laminar Flames Session Chair: E.L. Belmont	Heterogeneous Combustion Session Chair: H. Wang	Diagnostics Session Chair: R.M. Spearrin	Micro- Combustion/ New Concepts Session Chair: R.J. Milcarek	Other Session Chair: T. Holland
10:20	3A04: Impact of vinylic radicals + NO on the formation of cyanide-based species A.D. Danilack, C.F. Goldsmith	3B04: A comprehensive reduced-order manifold for non-adiabatic multi-modal turbulent combustion A.C. Nunno, M.E. Mueller	3C04: Experimental investigation of the blowoff characteristics of bluff-body stabilized 2D, V-shaped turbulent premixed propane-air flames R. Roy, B.M. Cetegen	3D04: Validation and uncertainty estimation of carbon fiber epoxy composite model S.N. Scott, A.J. Kurzawski, V.E. Brunini, J.C. Hewson, J.P. Hidalgo, R.M. Hadden, S. Welch	3E04: Exploring the distributed reaction regime for modeling noncatalytic partial oxidation of renewable fuels at elevated pressures D. Jaimes, V. McDonell, S. Samuelsen	3F04: The sensitivity of chemical kinetic models on flame transfer functions in acoustic fluctuation environments A. Girdhar, V. Acharya, W. Sun	3G04: Effect of aluminum nanoparticle additives on sooting hydrocarbon fuel droplet combustion A. Vargas, H.S. Sim, M. Plascencia, A.R. Karagozian	3H04: Simultaneous velocity and temperature measurements in turbulent nonpremixed flames using particle image velocimetry and filtered Rayleigh scattering thermometry T.A. McManus, J.A. Sutton	3J04: Hydrocarbon ignition on high surface area pt- electroplated wires Y. Shi, J.J. Whalen III, P.D. Ronney	3K04: Oxygen transport membranes for oxy-fuel combustion and carbon capture purposes R. Falkenstein-Smith, V. DeBiase, J. Ahn
			10:40 – 11:05 Break	with beverages and	l light snacks availa	able in the Upper a	and Lower Floors of	f the Atrium		
Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I Session Chair: H.J. Curran	Environmental Session Chair: YT. Liao	Turbulent Flames Session Chair: G. Magnotti	Fire I Session Chair: T.H. Fletcher	Engines Session Chair: R.P. Lucht	Laminar Flames Session Chair: J. Jayachandran	Heterogeneous Combustion Session Chair:	Diagnostics Session Chair: V.M. Sauer	Micro- Combustion/ New Concepts Session Chair: I. Schoegl	Fire II Session Chair:
11:05	3A05: Autoignition experiments and kinetic modeling of selected highly- branched C8- C16 iso- alkanes for surrogate fuel applications R. Fang, G. Kukkadapu, M. Wang, S.W. Wagnon, K. Zhang, M. Mehl, C.K. Westbrook, W.J. Pitz, CJ. Sung	3B05: Numerical investigation on hydrothermal flame of supercritical methanol combustion S. Saha, S.F. Ahmed, T. Farouk	3C05: The effects of resolution on the fidelity of two-dimensional flame surface density measurements in premixed flame subjected to extreme levels of turbulence A.W. Skiba, C.D. Carter, S.D. Hammack, J.F. Driscoll	3D05: Identifying processes controlling ignition of fuel beds by firebrands D. Bean, D.L. Blunck	3E05: Numerical investigation of petroleum and ice interaction based on the Lattice Boltzmann method H. Sezer, S.P. Kozhumal, A. Simeoni	3F05: Computational simulations of non-equidiffusive premixed combustion in obstructed channels with open extremes O. Abidakun, A. Adebiyi, D. Valiev, V. Akkerman	3G05: Ignition of solid fuels: A new approach to study the time delay R. Clay, K. Keivens, L. Carmignani, S. Bhattacharjee	3H05: Capturing spatial temperature distributions with broadband single-beam absorption spectroscopy N.A. Malarich, T.R.S. Hayden, G.B. Rieker	3J05: Hydrocarbonfueled portable power generator with no moving parts J. Wongwiwat, P. Bhuripanyo, T.S. Welles, V.P. DeBiase, J. Ahn, P.D. Ronney	3K05: Flame spread across materials commonly used on spacecraft at varied oxygen and pressure levels along the normoxic curve in simulated microgravity P. Spang, F.J. Miller, S.L. Olson, I.S. Wichman

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11:25	3A06: Ignition delay times of gas- to-liquid jet fuels behind reflected shock waves S.A. Alturaifi, B. Guo, E.L. Petersen	3B06: Advanced quality methods for thermal oxidizer operation R.J. Martin	3C06: Experimental assessment of the state-space structure of CH ₂ O, CH, and OH within premixed flames subjected to extreme turbulence A.W. Skiba, C.D. Carter, S.D. Hammack, J.F. Driscoll	3D06: Critical conditions for ignition of structural materials by piles of smoldering firebrands H. Salehizadeh, J.C. Oey, M. Scott, M.J. Gollner	3E06: The effect of chemical and physical fuel properties on the approval and evaluation of alternative jet fuels J.S. Heyne, K.C. Opacich, E. Peiffer, M. Colket	3F06: The role of wall conditions in finger flame acceleration in channels: A computational study F. Kodakoglu, M. Alkhabbaz, D. Valiev, V. Akkerman	3G06: Understanding the physical interpretation of proper orthogonal decomposition and dynamic mode decomposition for liquid injection S.B. Leask, V.G. McDonell, S. Samuelsen	3H06: Simultaneous temperature and concentration measurements using AOM- coupled laser absorption spectroscopy Z.E. Loparo, E. Ninnemann, K. Thurmond, A. Laich, A. Azim, A. Lyakh, S.S. Vasu	3J06: Richburn, Flame-assisted fuel cell, Quickmix, Lean-burn (RFQL) furnace R.J. Milcarek, V.P. DeBiase, J. Ahn	3K06: Effect of char oxidation on near-limit flames in microgravity P.B. Kumar, K. Naresh, A. Kumar
11:45	3A07: Experimental and modeling study of the autoignition behavior of a standard oxygenated gasoline fuel M. Mehl, D. Kang, S.S. Goldsborough, G. Kukkadapu, K. Zhang, S. Wagnon, W.J. Pitz, C.K. Westbrook	3B07: Radiation modeling for gas turbine relevant conditions S. Zhang, A. Johnson, X. Zhao	3C07: Distributed turbulent combustion studies using PLIF diagnostics N. Diskerud, A.W. Skiba, J.F. Driscoll	3D07: Effects of fuel morphology on ember generation characteristics at the tree-scale T.R. Hudson, R.B. Bray, D.L. Blunck	3E07: Nonlinear dynamics of closely spaced thermoacoustic modes in the presence of noise T. John, G. Ghirardo, V. Acharya, M. Bothien, T. Lieuwen	3F07: Propagation and morphology of supercritical CO ₂ -diluted oxy-methane flames in obstructed channels A. Adebiyi, G. Udochukwu, V. Akkerman	3G07: H ₂ and CO kinetic coupling during catalytic combustion of syngas/air over Palladium oxide R. Sui, W. Liang, L. Zhang, J. Mantzaras, C.K. Law	3H07: A novel two-color pyrometry system for high spatial resolution temperature measurements in flames S.A. Reggeti, A.K. Agrawal, J.A. Bittle	3J07: Meso/micro- scale combustion of natural gas for fuel cell applications B.B. Skabelund, R.J. Milcarek, H. Nakamura, K. Maruta, J. Ahn	3K07: Low-gravity near-blowoff opposed and concurrent flame behavior of burning cotton in parabolic aircraft testing and microgravity drop tower testing S. Olson, H. Torikai, K. Hokari, M. Fukuda

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12:05	3A08: Autoignition behavior of iso-olefins s.s. Goldsborough, D. Kang, B. Wagner, K. Zhang, W.J. Pitz	3B08: Firetec reconstructive simulations of the Fort McMurray wildfire (Alberta, Canada 2016) T. Holland, G. Marshall, D. Thompson, R. Linn	3C08: Multi- scalar measurements of premixed flames in extreme turbulence using Raman/Rayleigh diagnostics T.M. Wabel, A.M. Steinberg, R.S. Barlow	3D08: Fire ember pyrometry using a color camera D.K. Kim, P.B. Sunderland	3E08: Light-round ignition sequences of premixed annular gas turbine combustors P.M. Allison, P.M. de Oliveira, R. Ciadiello, A. Skiba, E. Mastorakos	3F08: Modeling of supercritical CO ₂ -diluted oxy-methane burning in Mchannels A. Adebiyi, V. Akkerman	3G08: Partial oxidation of methane within an opposed flow reactor with an embedded catalyst mesh Y. Lin, G. Kogekar, C. Karakaya, H. Zhu, R.J. Kee, W.F. Northrop	3H08: Temperature calculation of non-burning & burning materials exposed to a flame using a multispectral infrared camera SOA. Gnessougou, A. Huot, M. Larivière-Bastien, MA. Langevin, B. Saute, A. De Champlain, X. Maldague	3J08: Microreactor combustion of simple hydrocarbons M.E. Baumgardner	3K08: Temperature and motion tracking of metal spark sprays J.L. Urban, Y. Liu, C. Fernandez-Pello, C. Xu
12:25	3A09: Universal ignition delay times of gasoline F. Khaled, A. Farooq	3B09: Structural analysis of soot generated in a coflow diffusion flame formed using biodiesel, diesel, and diesel-biodiesel blends A. Abdihamzehkolaei, W. Merchan- Merchan	3C09: Flow visualization of fire propagation in mixed vegetative fuel beds A.H. Aminfar, D.R. Weise, M. Princevac	3D09: Interaction of moisture content, fuel bed structure, and ventilation on the burning rate S. McAllister		3F09: Characteristics of flames in quasi-2D channels: Propagation rates and scaling parameters S. Shen, J. Wongwiwat, P. Ronney	assisted chemical looping CH ₄ reforming with water splitting using Ru/CeO ₂ nano-rods R.V. Ranganathan, Z. Liu, S.M. Fondriest, R. Wang, M. Uddi	3H09: High- precision aerosol phosphor thermometry with Ce ³⁺ and Pr ³⁺ co-doped into lutetium aluminum garnet D. Witkowski, J. Herzog, D.A. Rothamer	3J09: Microreactor design optimization and manufacturing for studying high temperature unimolecular decomposition of large molecules J. Sampathkumar, T. Fan, J. Daily, B. Ellison, N.J. Labbe	3K09: Effects of ullage on combustion efficiency and plume entrainment of pit fires V. Kimmerly, A.S. Rangwala

 $13:00-15:30\ NASA/JPL\ Lab\ Tour$ Bus leaves at 12:30 Buses from the Green Street entrance of the Pasadena Convention Center

Safe travels home and we hope to see you at the 12th U.S. National Combustion Meeting hosted by the Central States Section of the Combustion Institute

11th United States National Combustion Meeting Work in Progress Posters

P01	Qiosk: Chemical kinetic model construction using high performance machine learning
D02	Ramanan Sankaran A detailed showing binetic model for the sympositical vector evidetion of methylemina. The importance of imine formation
P02	A detailed chemical kinetic model for the supercritical water oxidation of methylamine: The importance of imine formation
D02	Mohammad Ashraful Alam, Gabriel Da Sliva
P03	Understanding the effects of boundary layers on ignition of fuels with complex temperature dependence
D0.4	Miles Burnett, Charles Daniels, Margaret Wooldridge
P04	Understanding the blending octane behavior of 2-methylfuran
	Vijai Shankar Bhavani Shankar, S. Sarathy, Eshan Singh, Samah Mohamed
P05	Shock-tube measurements of OH* chemiluminescence in mixtures of H ₂ -NO ₂ and H ₂ -N ₂ O
	Clayton Mulvihill, Eric Petersen
P06	Investigation of non-ideal shock-tube behavior and its facility dependence
	Sean Cooper, Eric Petersen, Damien Nativel, Mustapha Fikri, Christof Schulz
P07	Atmospheric flow reactor facility for study of N ₂ O under incipient reaction conditions
	Francis (Mac) Haas, Haseeb Bukhari, Meagan Schweiger, Ryan Sweeney, Jeremy Rainey, Gianna Oldt, Rory Cronogue
P08	2-Line temperature measurement in miniature shock tube
	Patrick Lynch, Rizwan Shaik, Ashish Sutar, Tushar Sharma, Peng Zhao
P09	Computational design of staged pressurized oxy-coal combustion
	Gideon Udochukwu, Vyacheslav Akkerman, Abdulafeez Akinola Adebiyi
P10	Effects of non-uniform blockage ratio and obstacle spacing on wave speed and overpressure during flame propagation in premixed H ₂ /Air and H ₂ /O ₂ mixtures
	Cassio Brunoro Ahumada, Qingsheng Wang, Eric Petersen
P11	High pressure, high flow rate flow mixing apparatus
	Patrick Lynch, Anandvinod Dalmiya, Jai Mehta, Andrew Laich
P12	High-speed OH* and CH* chemiluminescence imaging and OH-PLIF diagnostics in spherically expanding flames
	Pradeep Parajuli, Tyler T. Paschal, Yejun Wang, Mattias A. Turner, Eric L. Petersen, Waruna D. Kulatilaka
P13	Spatially-resolved temperature and species in a hybrid rocket reaction layer based on laser absorption tomography
	Fabio Bendana, Josue Castillo, China Hagström, Raymond Spearrin
P14	Tabletop line-tunable vacuum-UV light source for identifying radicals, isomers, and fragmenting ions
	Nicole Labbe, David Couch, Cory Rogers, Jatinder Sampathkumar, Dan Hickstein, Sterling Backus, Margaret Murnane, Henry Kapteyn, Barney Ellison
P15	Flame merging patterns in two dimensions observed with three flames
1 10	Thomas H. Fletcher, Connor Last, Colton Van Wagoner, Trevor Black, Chen Shen
P16	Upward flame spread over a thin sample in a confined tunnel—effects of flow confinement and radiative interactions
110	Ya-Ting Liao, Yanjun Li
P17	Vertical fuel distribution effects on flame length in wildfires
11/	Torben Grumstrup
P18	Ignition and combustion behavior of piezoelectric BiFeO ₃ and Bi ₂ WO ₆ in nanothermite formulations
1 10	Feiyu Xu, Haiyang Wang, Michael Zachariah
P19	Tuning combustion performance of Al/PVDF energetic films through direct-write additive manufacturing
F 19	Miles Rehwoldt, Haiyang Wang, Dylan Kline, Michael Zachariah, Noah Eckman, Niti Agrawal
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P20	Investigation of the effect of varying H/D ratios on the near-field spray characteristics of a swirl burst injector
D21	Lulin Jiang, Md Nayer Nasim, Imtiaz Qavi, Oladapo Akinyemi Purming rote characterization of ammonium parchlerate pollets with apprentic and matel evide additives.
P21	Burning rate characterization of ammonium perchlorate pellets with energetic and metal oxide additives
	Felix Rodriguez, Erica Petersen, James Thomas, Catherine Dillier, Eric Petersen

The burning rate characteristics of Polyoxymethylene (POM) in the opposed flow burner

Gerardo Talamantes, Richard Yetter, Eric Boyer

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P23	Small-volume, high-throughput techniques for fuel physical property measurements Wanjun Dang, Shyam Menon, Manas Gartia, Nishir Mehta
P24	Experimental investigation and modeling of oxidizer size and concentration effects on composite AP/HTPB propellant burning rates James Thomas, Gordon Morrow, Catherine Dillier, Eric Petersen
P25	Performance enhancement of HTPB fuels burning in gaseous oxygen by metallic additives James Thomas, Felix Rodriguez, Andrew Tykol, Eric Petersen
P26	Observing microscale combustion dynamics of a printed Al/CuO composite through high-speed videography and thermometry Dylan Kline, Haiyang Wang, Michael Zachariah
P27	Effects of nano-assembly aluminum on the burning rates of AP/HTPB-based composite propellants Catherine Dillier, Eric Petersen, Sudipta Seal, Kevin Grossman
P28	Simulations and experimental measurements of solid-phase temperatures in a dust-flame burner
P29	David Kessler, Brian T. Fisher, Ryan Johnson, Rohit Jacob Ink formulation strategy of high loading nanothermite for 3D printing
P30	Haiyang Wang, Jinpeng Shen, Dylan Kline, Noah Eckman, Michael Zachariah Numerical simulation of cool flame combustion for an n-heptane droplet in microgravity conditions
P31	Matthew Q. Brown, Erica L. Belmont Numerical simulation of premixed combustion in a two-stroke polygon engine
	Kevin Anderson, Christian Mendez
P32	Head-on quenching of laminar methane-air flames on a plate at temperatures below 300 K Thibault Guiberti, Jason Damazo, Eddie Kwon, William Roberts, Deanna Lacoste
P33	Evaluation of cool flame ignition temperature on heated walls Minhyeok Lee, Yong Fan, Yuji Suzuki
P34	Combustion for zero-emission power generation: Stability and species Investigation of laminar oxy-fuel flames in CO ₂ environments at high temperatures and pressures Fares Maimani, Gaetano Magnotti, Robert Dibble
P35	Uncertainty analysis for laminar flame speed measurements of low vapor pressure liquid fuels Charles Keesee, Eric Petersen
P36	Dilution and pressure effects on ignition and extinction behavior of n-heptane-air mixtures in nonadiabatic perfectly stirred reactors Vinicius Maron Sauer, Ingmar Schoegl
P37	The effect of droplets on laminar flame propagation for an acetone/air strained premixed flame Dante McGrath, Luming Fan, Cheng Tung Chong, Simone Hochgreb
P38	Experimental characterization of freely propagating n-decane cool flames at sub-atmospheric pressures Marcus C. Brown, Erica L. Belmont
P39	A non-thermal plasma fuel reformer for the production of hydrogen-rich syngas Howard Pearlman
P40	Capacitance sensor for combustion
P41	Jackson Pleis, Robert Geiger, Donald Kendrick Plasma-assisted catalysis of CO ₂ and CH ₄ Howard Pearlman
P42	Effect of the electrode material on ignition of stoichiometric methane – Air mixture Abdeldjalil Reguig, Jason Damazo, Eddie Kwon, Deanna Lacoste
P43	A new shock tube facility for studying aerosolized mixtures of hydrocarbon liquids
P44	Joshua Hargis, Eric Petersen, Sean Cooper, Olivier Mathieu Understanding the burning rates of nitromethane Gregory Derk, Grant Risha, Eric Boyer, Nicholas Finch, Richard Yetter, Richard Dobbins, Mitchell Smooke

P45	Preliminary design and testing of thermite fueled power plant for Martian colonies
	Jake Sugden, Jacob Cato, Wyatt Albert, Jeremy Cheng, Tyler Hutchison, Mark Killian, Mahdi Yoozbashizadeh, Joseph Kalman
P46	The role of free radicals in soot formation
	Hope Michelsen, Olof Johansson, Paul Schrader, Martin Head-Gordon, Josie Hendrix, Diptarka Hait, Kevin Wilson
P47	The effect of soot in oxy-coal combustion systems
	Kamron Brinkerhoff, Alex Josephson, Benjamin Isaac, Jeremy Thornock, David Lignell
P48	Investigation of combustion pathways for nitrogen-containing fuels: Isomeric analysis of C ₆ H ₁₅ N
	Brian Etz, Hyunguk Kwon, Matthew Montgomery, Peter St. John, Charles McEnally, Lisa Pfefferle, Robert McCormick, Shubham Vyas, Seonah Kim
P49	A polynuclear aromatic hydrocarbon properties database
	Jennifer Giaccai, Erin Adkins, Rachelle Jacobson, Erin Rae Russell, Houston Miller
P50	Cooling of intake air with liquid nitrogen to improve engine efficiency
	Sufyan Jan, Robert Dibble, Jean-Baptiste Masurier
P51	Numerical simulation of non-premixed combustion in an array of actively forced jets
	Kevin Anderson, Daniel Trejo
P52	Prediction of the autoignition of a fuel jet in a confined turbulent hot coflow using machine learning methods
	Suhui Li, Wenkai Qian, Haoyang Liu, Min Zhu, Christos Markides
P53	Heat release effects on the Reynolds stress budgets in turbulent premixed flames
	Jinyoung Lee, Michael Mueller
P54	Molecule-informed simulation method in non-equilibrium combustion
	Myoungkyu Lee, Jacqueline Chen, Michail Gallis
P55	On the transition of autoignitive jet flames to MILD combustion
	Aravind Ramachandran, Arjun Chauhan, Venkat Narayanaswamy, Kevin Lyons

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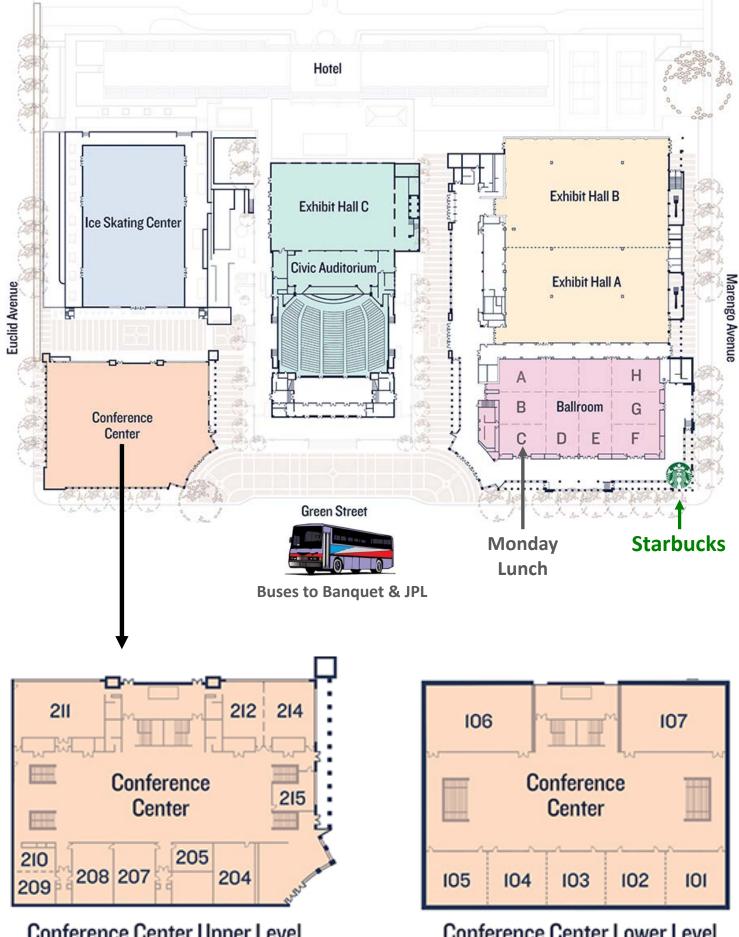
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