

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 micro-aggressions. 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.

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

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10:35	1A04: Studies of low and high temperature oxidation of n-pentane with nitric oxide and nitrogen dioxide additions in a jet stirred reactor <i>H. Zhao, A.G. Dana, Z. Zhang, W.H. Green, Y. Ju</i>	1B04: A unifying analytical framework of using Jacobian matrices with consistent state vectors <i>P. Sharma, A. Newale, S. Pope, P. Pepiot</i>	1C04: A non-local analysis of strong fluctuations in non-premixed turbulent jet flames <i>M. Gauding, D. Denker, Y. Brahami, M. Bode, E. Varea, L. Danaila</i>	1D04: The influence of an immersed heater on pool fire burning behaviors <i>X. Pi, L. Chang, A.S. Rangwala</i>	1E04: Impact of ethanol additions on autoignition characteristics of a full boiling range gasoline and its surrogates at advanced engine conditions <i>D. Kang, A. Fridyland, S.S. Goldsborough, M. Mehl, S. Wagnon, W.J. Pitz, M.J. McNeenly</i>	1F04: Experiments and modeling of NO _x formation in premixed stagnation flames of a typical jet A <i>K. Wan, C. Saggese, R. Xu, H. Wang</i>	1G04: Mapping the dual-fuel combustion modes of a light-duty diesel engine at medium speed and low load <i>J. Martin, A. Boehman</i>		1J04: 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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Make sure to stop by, visit and vote. Voting closes Tuesday at 17:30

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	Chemical Kinetics I <i>Session Chair: W. Sun</i>	Chemical Kinetics II <i>Session Chair: S.S. Vasu</i>	Turbulent Flames <i>Session Chair: M.E. Mueller</i>	Fire <i>Session Chair: K. Hinnant</i>	Engines <i>Session Chair: P.M. Allison</i>	Laminar Flames <i>Session Chair: V. Akkerman</i>	Laminar Flames II <i>Session Chair: K.E. Niemeyer</i>	Detonations <i>Session Chair: C.F. Lietz</i>	Soot <i>Session Chair: G.M. Fioroni</i>	Coal <i>Session Chair: J.C. Parra-Álvarez</i>
11:20	1A05: Influence of chemically termolecular reactions on species concentrations during RDX combustion <i>R.E. Cornell, C.E. LaGrotta, M.C. Barbet, M.P. Burke</i>	1B05: Understanding of the differences of graph-based mechanism reduction methods through a new species block strategy <i>G. Xiao</i>	1C05: Do turbulent nonpremixed cool flames require special treatment? <i>A.G. Novoselov, C.B. Reuter, O.R. Yehia, Y. Ju, M.E. Mueller</i>	1D05: Effect of initial fuel temperature on flame spread rate of alternative aviation fuels <i>V. Goyal, R. Roncancio, J. Kim, A. Navarkar, V.R. Hasti, J.P. Gore</i>	1E05: Examination of predictive flame blow off boundaries for premixed fuel/air reactions at gas turbine pre-mixer conditions <i>C. Hernandez, V. McDonell</i>	1F05: Numerical investigation of real gas effects in premixed CH ₄ - O ₂ flames at cryogenic conditions <i>A. Gopal, P.S. Volpiani, S. Yellapantula, J. Larsson</i>	1G05: Application of physics-based machine learning in combustion modeling <i>A. Takbiri-Borujeni, M. Ayoobi</i>	1H05: Extension of detonation limits using ozone as an additive <i>X. Shi, J. Crane, H. Wang</i>	1J05: Experimental and theoretical study of the soot-forming tendencies of furans as potential biofuels <i>J. Zhu, H. Kwon, C.S. McEnally, Y. Xuan, P.C. St. John, S. Kim, L.D. Pfefferle</i>	1K05: Assessment of various tar and soot treatment methods for use in coal combustion simulation <i>J. McConnell, J.C. Sutherland</i>

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

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

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

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14:35	1A11: Ring opening of cycloalkanes at high temperatures <i>T. Sikes, R.S. Tranter</i>	1B11: RON and MON chemical kinetic modeling study <i>J.A. Corrubia, J.M. Capece, N.P. Cernansky, D.L. Miller, P.M. Najt, R.P. Durrett</i>	1C11: Differential diffusion modelling in LES/TPDF simulations of turbulent flames <i>H. Zhou, T. Yang, W. Xie, Z. Ren</i>	1D11: Simulation of unsteady radiation effects in laminar diffusion flames <i>R. Xu, A. Marchand, V.M. Le, T. Rogaume, F. Richard, J. Luche, A. Trouvé</i>	1E11: 3-D modeling of the CFR engine for the investigation of knock on natural gas <i>D. Bestel, B. Windom, D. Olsen, S. Bayliff, H. Xu</i>	1F11: Stratified spherical flame propagation of low molecular weight fuels in the presence of electric fields <i>J.-Y. Chen, X. Shi, N. Leberher, S. Yu</i>	1G11: Reaction propagation in a printed Al/CuO composite observed using high-speed microscopy and thermometry <i>H. Wang, D.J. Kline, M.R. Zachariah</i>	1H11: Boundary layer ignition modeling <i>S.A. Coronel, S. Lapointe, J.E. Shepherd</i>	1J11: On the growth of Polycyclic Aromatic Hydrocarbons (PAHs) in a coflow diffusion flame <i>T. Mitra, C. Chu, T. Zhang, A.D. Sediako, M.J. Thomson</i>	1K11: Improvement of computational efficiency for discrete transfer radiation calculations through the use of dimensionally adaptive mesh techniques <i>T. Williams, B.R. Adams</i>
14:55	1A12: Kinetic studies of excited singlet oxygen atoms O(¹ D) reactions with methanol and ethanol <i>H. Zhong, C. Yan, C.C. Teng, T. Chen, A.C. Rousso, G. Wysocki, Y. Ju</i>	1B12: Foundational fuel chemistry model <i>Y. Zhang, Y. Tao, G. Smith, H. Wang</i>	1C12: Application of the hierarchical parcel swapping (HiPS) model to turbulent reacting flows <i>D. Lignell, A. Kerstein, A. Perego, T. Starick, J. Frei, H. Schmidt</i>	1D12: Simulations of a turbulent line fire with a steady flamelet combustion model and non-gray gas radiation models <i>V.M. Le, R. Xu, A. Marchand, S. Verma, T. Rogaume, F. Richard, J. Luche, A. Trouvé</i>	1E12: Large-eddy simulations of an ethanol direct-injection spark-ignition IC engine <i>S.J. Kazmouz, D.C. Haworth</i>	1F12: R-152a/air and R-134a/oxygen constant volume spherical flame burning velocity measurements <i>R.R. Burrell, M.J. Hegetschweiler, D.R. Burgess Jr., J.A. Manion, V.I. Babushok, G.T. Linteris</i>	1G12: Aluminum particle reactivity as a function of alumina shell structure: Amorphous versus crystalline <i>R. Walzel, M. Pantoya</i>	1H12: Premixed ethylene-air combustion in a dual-mode scramjet cavity flameholder <i>G.B. Goodwin, R.F. Johnson, H.K. Chelliah</i>	1J12: Isomer-specific combustion chemistry in opposed-flow diffusion flames of allene and propyne <i>G. Kukkadapu, N. Hansen, S.W. Wagnon, W.J. Pitz</i>	1K12: Exploring continuous monitoring methods for SO ₃ and H ₂ SO ₄ in flue gas conditions <i>A. Biasioli, D. Dunn-Rankin, Y.-C. Chien</i>
15:15	1A13: HO ₂ + HO ₂ : High level theory and the role of singlet channels <i>S.J. Klippenstein, R. Sivaramakrishnan, U. Burke, K.P. Somers, H.J. Curran, L. Cai, H. Pitsch, M. Pelucchi, T. Faravelli, P. Glarborg</i>	1B13: High fidelity thermo-chemistry for kinetic modeling of methyl chloride combustion <i>D. Farina, Jr., S.K. Sirumalla, D. Sotir, R.H. West</i>		1D13: Detailed modeling of a small-scale turbulent pool fire <i>B. Wu, X. Zhao, S. Roy</i>	1E13: Predicting cycle-to-cycle variations in a spark-ignition engine using multi-cycle large eddy simulation <i>Y. Su, D. Splitter, S.H. Kim</i>	1F13: On the laminar burning speed and spherical flame structure of anisole-air premixed mixture <i>S. Zare, S. Roy, O. Askari</i>	1G13: Effect of polymer addition on burning rate of Pennsylvania crude <i>G. Singh, M. Esmaeilpour, A. Ratner</i>	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 <i>B.D. Adamson, S.A. Skeen, M. Ahmed, N. Hansen</i>	1K13: Proposed criteria for MILD coal combustion <i>H. Zhou, T.A. Ring, J.C. Sutherland</i>

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

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Winners will be announced Tuesday night at the Banquet

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Work in Progress Posters Session is 08:00 – 18:00 in the Upper and Lower Floors of the Atrium

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

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16:35	1A16: A revisit of constant temperature approximation in chemical kinetics study using single pulse shock tubes with speciation <i>X. Han, J.M. Mehta, K. Brezinsky</i>	1B16: An experimental and modelling study of 2,4,4 trimethyl-1-pentene <i>N. Lokachari, K. Zhang, W.J. Pitz, H.J. Curran</i>	1C16: Understanding the effect of nanosecond pulsed discharge on ignition and flame stability of methane jet flames <i>S. Zare, H.W. Lo, A. El Maadi, S. Roy, K. Kim, O. Askari, F.G. del Campo</i>	1D16: A study of intermittent convective heating effects on fine fuel ignition <i>L. Benny, N. Chui, N. Warner, M.J. Gollner</i>	1E16: Numerical study on direct injection of hydrogen-methane blends into a constant volume combustion chamber <i>M. Shahsavan, M. Morovatiyan, J.H. Mack</i>	1F16: Rate-ratio asymptotic analysis of the influence of addition of carbon monoxide on the structure and mechanisms of extinction of nonpremixed methane flames <i>K. Seshadri, X.-S. Bai</i>	1G16: Numerical investigation of <i>n</i> -dodecane spray ignition <i>C. Zheng, B. Akih-Kumgeh</i>	1H16: An analysis of irregular detonation phenomena using machine learning and numerical simulation <i>K. Grogan, M. Ihme, Y. Lv</i>	1J16: Predicting soot formation and emission in wildland fires with FIRETEC <i>A.J. Josephson, R.R. Linn, E. Koo</i>	1K16: A continuum model for graphene oxidation <i>J. Graña-Otero, S. Schmitt</i>
16:55	1A17: Multi-species time history measurements during ethanol pyrolysis behind reflected shock waves <i>R. Choudhary, Y. Peng, J. Shao, D.F. Davidson, R.K. Hanson</i>	1B17: Validated model for burning velocities of R-32/O ₂ /N ₂ mixtures over a wide range of conditions <i>D.R. Burgess, Jr., J.A. Manion, R.R. Burrell, V.I. Babushok, M.J. Hegetschweiler, G.T. Linteris</i>	1C17: Ignition and flame kernel development in lean premixed H ₂ /air flowing gases <i>S. Jo, J. Kim, J.P. Gore</i>	1D17: Effects of fuel characteristics on spread rate and surface temperatures of smoldering duff <i>D.A. Cowan, D.L. Blunck</i>	1E17: Influence of the real-gas equation-of-state binary interaction coefficients on the turbulent mixing at diesel-engine high-pressure conditions <i>D.T. Banuti, J. Bellan</i>	1F17: The influence of ammonia on soot formation and flame characteristics in laminar ammonia/methane diffusion flames <i>M.J. Montgomery, H. Kwon, Y. Xuan, C.S. McEnally, L.D. Pfefferle</i>	1G17: Predicting drop impact on heated walls using multiphase SPH with adaptive resolution <i>X. Yang, S.-C. Kong, C.-B.M. Kweon</i>	1H17: Study on analog system of detonation with two step chemical reaction model <i>Y. Sun</i>	1J17: Soot volume fraction measurements in piloted turbulent nonpremixed flames at elevated pressures <i>W.R. Boyette, A. Bennett, T.F. Guiberti, W.L. Roberts</i>	1K17: Modulated thermogravimetric experiments on Argonne premium coal samples with combustion gas analysis <i>S. Stuhlman, K. Kumar</i>
17:15	1A18: The experimental pursuit of elementary reaction rates for iso-propanol pyrolysis using multi-species constraint <i>A. Mansfield, M. Burnett, S.W. Wagnon, C. Thomas, M.S. Wooldridge</i>	1B18: Sensitivity of HyChem model accuracy to species measurement uncertainties of fuel pyrolysis <i>R. Xu, H. Wang</i>	1C18: Lift-off behavior of turbulent cool flames stabilized by autoignition <i>C.B. Reuter, Y. Ju</i>	1D18: Influence of lignin on smoldering propagation <i>B.D. Smucker, W.J. Jayasuriya, K.E. Niemeyer, D.L. Blunck</i>	1E18: Evaluation of combustion models for CFD simulation of pre-chamber ignition in a natural gas engine <i>J. Kim, R. Scarcelli, S. Som, A. Shah, M.S. Biruduganti, D.E. Longman</i>	1F18: Double blue zones in inverse and normal laminar jet diffusion flames <i>Z. Wang, P.B. Sunderland, R.L. Axelbaum</i>	1G18: Numerical study of drop impact on heated wall using SPH simulation <i>Y. Pan, X. Yang, S.-C. Kong</i>	1H18: Effect of boundary conditions on detonation simulations: A geometric model study <i>J. Crane, X. Shi, H. Wang</i>		1K18: The ozonolysis of isoprene in a cryogenic buffer gas cooling cell: A new method for branching ratios analysis <i>J.P. Porterfield, S. Eibenberger, D. Patterson, M.C. McCarthy</i>

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

Winners will be announced Tuesday night at the Banquet

Sponsors are displayed in the Atrium Lower Floor

Work in Progress Posters Session is 08:00 – 18:00 in the Upper and Lower Floors of the Atrium

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

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10:00	2A03: Insights into the reactions of hydroxyl radical with diolefins <i>F. Khaled, B.R. Giri, D. Liu, E. Assaf, C. Fittschen, A. Farooq</i>	2B03: Towards a high-accuracy kinetic database informed by theoretical and experimental data <i>C.E. LaGrotta, M.C. Barbet, L. Lei, M.P. Burke</i>	2C03: Time-efficient methods for real fluid property evaluation in numerical simulation of chemically reacting flows <i>P.J. Milan, Y. Li, X. Wang, S. Yang, W. Sun, V. Yang</i>	2D03: Numerical modeling of soot-radiation in optically-thin, buoyant diffusion flames of varying oxygen index <i>P. Chatterjee, K.V. Meredith, Y. Wang</i>	2E03: Analysis of transient thermoacoustic oscillations in a liquid fueled gas turbine combustor at elevated pressures <i>T.M. Wabel, S. Yang, M. Passarelli, J.D.M. Cirtwill, P. Saini, K. Venkatesan, A.M. Steinberg</i>	2F03: Experimental investigations of laminar flame propagation of C ₁ -C ₄ /O ₂ /inert mixtures at engine-relevant conditions <i>A. Movaghar, R. Lawson, F.N. Egolfopoulos</i>	2G03: Modeling disruptive burning in multicomponent droplets <i>T. Yau, M. Ihme</i>	2H03: Hyperspectral absorption tomography with a lineshape prior <i>S.J. Grauer, J. Emmert, A.M. Steinberg, S. Wagner, K.J. Daun</i>	2J03: Soot precursor formation from oxygenated aromatics: How oxygen functionality alters organic reaction pathways <i>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</i>	2K03: Molecular level combustion simulations using the DSMC method <i>S. Trivedi, R.S. Cant, J.K. Harvey</i>
10:20	2A04: Low temperature oxidation of ethylene by ozone in a jet-stirred reactor <i>A.C. Rousso, N. Hansen, A.W. Jasper, Y. Ju</i>	2B04: A chemical functionality approach towards the formulation of a high-fidelity surrogate fuel for FACE gasoline F <i>A.D. Ure, S. Dooley, D. Kang, S.S. Goldsborough</i>	2C04: An overview of multi-physics modeling considerations for turbulent jet flames with inhomogeneous inlets <i>B.A. Perry, M.E. Mueller</i>	2D04: Numerical study of fire behavior between two inclined panels <i>Q. Li, Y.-T.T. Liao</i>	2E04: Flame-wall fuel film interaction under engine thermodynamic conditions <i>M. Tao, P. Zhao</i>	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 <i>E.R. Westphal, S.F. Son, E. Quintana, K.N.G. Hoffmeister</i>	2J04: In situ imaging studies of combustor pressure effects on soot oxidation <i>A.D. Sediako, A. Bennett, W.L. Roberts, M.J. Thomson</i>	2K04: A numerical investigation of quenched laser-ignited CH ₄ and biogas mixtures near the lean flammability limit <i>D. Coombs, N. Peters, B. Akih-Kumgeh</i>
10:40 – 11:05 Break with beverages and light snacks available in the Upper and Lower Floors of the Atrium										
Make sure to visit our Sponsors in the Atrium Lower Floor and the Work in Progress Posters in the Upper and Lower Floors of the Atrium										

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

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

Room	Room 106	Room 107	Room 102	Room 212	Room 211	Room 101	Room 208	Room 204	Room 207	Room 210
	Chemical Kinetics I <i>Session Chair: M.P. Burke</i>	Turbulent Flames I <i>Session Chair: D.I. Pineda</i>	Turbulent Flames II <i>Session Chair: R. Sankaran</i>	Fire <i>Session Chair: M.J. Gollner</i>	Engines <i>Session Chair: J. Kim</i>	Laminar Flames <i>Session Chair: R.L. Axelbaum</i>	Heterogeneous Combustion <i>Session Chair: J. Kalman</i>	Diagnostics <i>Session Chair: S.J. Grauer</i>	Micro-Combustion/ New Concepts <i>Session Chair: M.E. Baumgardner</i>	
16:00	2A15: Autoignition of CRC diesel surrogates at low temperature combustion conditions: Rapid compression machine experiments and modeling <i>M. Wang, G. Kukkadapu, K. Zhang, S.W. Wagnon, M. Mehl, W.J. Pitz, C.K. Westbrook, C.-J. Sung</i>	2B15: Dynamics of scalar isosurfaces in isotropic turbulence <i>T. John, V. Acharya, T. Lieuwen</i>	2C15: Ignition and flame propagation in a supersonic cavity <i>E. Hassan, T. Ombrello, D.M. Peterson</i>	2D15: Forced convection fire spread along wooden dowel array <i>G. Di Cristina, S. Kozhumal, A. Simeoni, N. Skowronski, A. Rangwala, S.-k. Im</i>	2E15: Emissions formation in a heavy-duty compression-ignited engine converted to natural gas spark-ignited operation <i>J. Liu, C.E. Dumitrescu</i>	2F15: Experimental and numerical investigation of n-heptane cool flame structures and propagation speeds at sub-atmospheric pressures <i>M. Hajilou, M.Q. Brown, M.C. Brown, E. Belmont</i>	2G15: Aging effects on the pyrolysis rate of polymeric binders and fuels <i>A.R. Demko, T.D. Hedman, C.N. Dennis</i>	2H15: Evolution of the OH relative concentration during flame quenching in a rectangular cross section channel <i>A.M. Mahuthannan, P. Liu, J. Damazo, E. Kwon, D.A. Lacoste, W.L. Roberts</i>	2J15: Numerical investigation of ignition characteristics of selected fuel blends in a micro reactor <i>D. Akinpelu, I. Schoegl</i>	
16:20	2A16: A chemical pathway description of low-temperature propane ignition kinetics <i>S. Bai, R. Sivaramakrishnan, M.J. Davis, R.T. Skodje</i>	2B16: Topologically conditioned chemical flame structure for turbulent lean premixed flames <i>D. Dasgupta</i>	2C16: Investigating pulse combustion effects on the anode baking furnace energy consumption and emissions characteristics <i>A.R. Tajik, T. Shamim, A. Ghoniem, R.K.A. Al-Rub</i>	2D16: An experimental study on the effects of ullage on flame spread through wooden matchstick arrays <i>S.K. Lakkundi, V.M. Kimmerly, A.S. Rangwala</i>	2E16: Comprehensive emissions from a spark-ignited gasoline engine under transient load profiles <i>D. Wilson, D. Lehmier, C. Allen</i>	2F16: Numerical simulations of laminar nonpremixed CH ₄ -air jet flames influenced by varying electric fields <i>C-F. Lopez-Camara, M. Belhi, H.G. Im, D. Dunn-Rankin</i>	2G16: Direct writing of 90-weight percent nanothermite loading ink with a hybrid polymer <i>H. Wang, J. Shen, D.J. Kline, N. Eckman, N.R. Agrawal, T. Wu, P. Wang, M.R. Zachariah</i>	2H16: Exploiting line mixing effects for laser absorption spectroscopy at extreme combustion conditions <i>D.D. Lee, F.A. Bendana, R.M. Spearrin</i>	2J16: Low temperature soot regime of propane in a micro flow reactor with controlled temperature profile <i>A.H. Khalid, R.J. Milcarek, H. Nakamura, K. Maruta, J. Ahn</i>	

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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 <i>Session Chair:</i>	Turbulent Flames I <i>Session Chair:</i> <i>A. Saha</i>	Turbulent Flames II <i>Session Chair:</i> <i>F. Bisetti</i>	Fire <i>Session Chair:</i> <i>D. Zeng</i>	Engines <i>Session Chair:</i> <i>D.A. Rothamer</i>	Laminar Flames <i>Session Chair:</i> <i>E.L. Belmont</i>	Heterogeneous Combustion <i>Session Chair:</i> <i>H. Wang</i>	Diagnostics <i>Session Chair:</i> <i>R.M. Spearrin</i>	Micro-Combustion/ New Concepts <i>Session Chair:</i> <i>R.J. Milcarek</i>	Other <i>Session Chair:</i> <i>T. Holland</i>
09:20	3A01: Effects of pulsating flow field on NO and radially-inhomogeneous NO ₂ distribution in a multi-dimensional numerical investigation of McKenna-driven 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 Thermochemistry (DISTANT) finite-rate chemistry model to combustng and dissociating hypersonic flows <i>Z.A. LaBry, K.P. Grogan</i>	3C01: Experimental assessment of the stability and structure of turbulent premixed bluff-body stabilized flames at elevated pressures <i>A.W. Skiba, T.F. Guiberti, W.R. Boyette, W.L. Roberts, E. Mastorakos</i>	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 <i>T. Strickland, S.L. Kokjohn</i>	3F01: Propagation and extinction of premixed H ₂ -O ₂ -N ₂ edge-flames in a counter-flow burner <i>Z. Zhou, G.N. Narayanam, J.T. Weiss, P.D. Ronney</i>	3G01: Experiments and analysis of n-heptane/iso-butanol mixture droplet combustion <i>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</i>	3H01: Rayleigh scattering mixing rate diagnostic technique for enclosed burners <i>J.W. Dayton, B. Poettgen, B.M. Cetegen</i>	3J01: Enabling tailored porous media burners via additive manufacturing <i>S. Sobhani, P. Muhunthan, D. Mohaddes, E. Boigne, Z. Cheng, M. Ihme</i>	3K01: Low temperature oxidation of methylpropyl ether <i>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</i>

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09:40	3A02: Experimental measurements and kinetic modeling of NO _x formation for synthetic natural gas combustion under gas turbine relevant conditions <i>S.F. Ahmed, F.E. Alam, F.L. Dryer, T.I. Farouk</i>	3B02: Assessment of conditional source-term estimation for high pressure turbulent combustion modeling <i>C. Devaud, W.K. Bushe, J. Bellan</i>	3C02: Flame stabilization behavior of a heated reacting premixed jet in a hot vitiated crossflow <i>J.W. Dayton, B. Poettgen, B.M. Cetegen</i>	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 pre-spark heat release and low temperature chemistry of iso-octane in a boosted spark-ignition engine <i>D. DelVescovo, D. Splitter, J. Szybist</i>	3F02: Numerical study of unsteady negative edge flames in a periodic flow <i>S.W. Grib, M.W. Renfro</i>	3G02: Evaluation of free-floating droplet acceleration in ISS droplet combustion experiments <i>C.L. Vang, B.D. Shaw</i>	3H02: Filtered Rayleigh scattering of cellular flames in tubular burner <i>C.D. Carpenter, R.W. Pitz</i>	3J02: Effects of dilution and pressure on combustion characteristics within externally heated microchannels <i>S.N.R. Isfahani, V.M. Sauer, I.M. Schoegl</i>	3K02: Investigation of combustion behavior of a hot air balloon burner <i>C. Hernandez, F. Albalawi, C. Vuong, M. Tanaka, Y.-C. Chien, D. Dunn-Rankin</i>
10:00	3A03: Branching ratio of N ₂ O + O → Products determined from flow reactor experiments at intermediate temperatures <i>F.M. Haas, F.E. Alam, J.S. Santner, T.I. Farouk, F.L. Dryer</i>	3B03: Assessment of enthalpy-based conditional moment closure models in predicting ignition of lean and stoichiometric PRF-air mixtures with temperature inhomogeneity <i>W. Wang, S.H. Kim</i>	3C03: Analysis of blow-out mechanisms of turbulent swirl-stabilized non-premixed flames <i>D. Li, T. Jaravel, M. Ihme</i>	3D03: Modeling flame merging behavior of two buoyant flames as a function of horizontal and vertical separation distance <i>F. Cannon, T.H. Fletcher, C. Shen</i>	3E03: NMR spectroscopy for the analysis of real fuels: A case study of FACE gasoline F <i>A.D. Ure, J.E. O'Brien, S. Dooley</i>	3F03: Impact of the Lewis number on flame acceleration at the early stage of burning in pipes <i>O. Abidakun, M. Alkhabbaz, D. Valiev, V. Akkerman</i>	3G03: Theory of combustion of normal-alkane droplets supported by cool-flame chemistry <i>F.A. Williams, V. Nayagam</i>	3H03: Filtered Rayleigh scattering thermometry in highly turbulent premixed flames <i>I.T. Monje, J.A. Sutton</i>	3J03: Ignition and self-sustained catalytic combustion of methane oxygen mixtures in a platinum microtube <i>S. Stuhlman, E. Al-Gharibeh, S. Beyerlein, K. Kumar</i>	3K03: Flame characteristics of cryogenic hydrogen releases from high-aspect ratio nozzles <i>B.R. Chowdhury, E.S. Hecht</i>

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10:20	3A04: Impact of vinylic radicals + NO on the formation of cyanide-based species <i>A.D. Danilack, C.F. Goldsmith</i>	3B04: A comprehensive reduced-order manifold for non-adiabatic multi-modal turbulent combustion <i>A.C. Nunno, M.E. Mueller</i>	3C04: Experimental investigation of the blowoff characteristics of bluff-body stabilized 2D, V-shaped turbulent premixed propane-air flames <i>R. Roy, B.M. Cetegen</i>	3D04: Validation and uncertainty estimation of carbon fiber epoxy composite model <i>S.N. Scott, A.J. Kurzawski, V.E. Brunini, J.C. Hewson, J.P. Hidalgo, R.M. Hadden, S. Welch</i>	3E04: Exploring the distributed reaction regime for modeling noncatalytic partial oxidation of renewable fuels at elevated pressures <i>D. Jaimes, V. McDonell, S. Samuelsen</i>	3F04: The sensitivity of chemical kinetic models on flame transfer functions in acoustic fluctuation environments <i>A. Girdhar, V. Acharya, W. Sun</i>	3G04: Effect of aluminum nanoparticle additives on sooting hydrocarbon fuel droplet combustion <i>A. Vargas, H.S. Sim, M. Plascencia, A.R. Karagozian</i>	3H04: Simultaneous velocity and temperature measurements in turbulent nonpremixed flames using particle image velocimetry and filtered Rayleigh scattering thermometry <i>T.A. McManus, J.A. Sutton</i>	3J04: Hydrocarbon ignition on high surface area Pt-electroplated wires <i>Y. Shi, J.J. Whalen III, P.D. Ronney</i>	3K04: Oxygen transport membranes for oxy-fuel combustion and carbon capture purposes <i>R. Falkenstein-Smith, V. DeBiase, J. Ahn</i>
10:40 – 11:05 Break with beverages and light snacks available in the Upper and Lower Floors of 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 <i>Session Chair:</i> <i>H.J. Curran</i>	Environmental <i>Session Chair:</i> <i>Y.-T. Liao</i>	Turbulent Flames <i>Session Chair:</i> <i>G. Magnotti</i>	Fire I <i>Session Chair:</i> <i>T.H. Fletcher</i>	Engines <i>Session Chair:</i> <i>R.P. Lucht</i>	Laminar Flames <i>Session Chair:</i> <i>J. Jayachandran</i>	Heterogeneous Combustion <i>Session Chair:</i>	Diagnostics <i>Session Chair:</i> <i>V.M. Sauer</i>	Micro-Combustion/ New Concepts <i>Session Chair:</i> <i>I. Schoegl</i>	Fire II <i>Session Chair:</i>
11:05	3A05: Autoignition experiments and kinetic modeling of selected highly-branched C ₈ –C ₁₆ iso-alkanes for surrogate fuel applications <i>R. Fang, G. Kukkadapu, M. Wang, S.W. Wagnon, K. Zhang, M. Mehl, C.K. Westbrook, W.J. Pitz, C.-J. Sung</i>	3B05: Numerical investigation on hydrothermal flame of supercritical methanol combustion <i>S. Saha, S.F. Ahmed, T. Farouk</i>	3C05: The effects of resolution on the fidelity of two-dimensional flame surface density measurements in premixed flame subjected to extreme levels of turbulence <i>A.W. Skiba, C.D. Carter, S.D. Hammack, J.F. Driscoll</i>	3D05: Identifying processes controlling ignition of fuel beds by firebrands <i>D. Bean, D.L. Blunck</i>	3E05: Numerical investigation of petroleum and ice interaction based on the Lattice Boltzmann method <i>H. Sezer, S.P. Kozhumal, A. Simeoni</i>	3F05: Computational simulations of non-equidiffusive premixed combustion in obstructed channels with open extremes <i>O. Abidkun, A. Adebisi, D. Valiev, V. Akkerman</i>	3G05: Ignition of solid fuels: A new approach to study the time delay <i>R. Clay, K. Keivens, L. Carmignani, S. Bhattacharjee</i>	3H05: Capturing spatial temperature distributions with broadband single-beam absorption spectroscopy <i>N.A. Malarich, T.R.S. Hayden, G.B. Rieker</i>	3J05: Hydrocarbon-fueled portable power generator with no moving parts <i>J. Wongwiwat, P. Bhuripanyo, T.S. Welles, V.P. DeBiase, J. Ahn, P.D. Ronney</i>	3K05: Flame spread across materials commonly used on spacecraft at varied oxygen and pressure levels along the normoxic curve in simulated microgravity <i>P. Spang, F.J. Miller, S.L. Olson, I.S. Wichman</i>

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

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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. Adebisi, 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 S.-O.-A. Gnossougou, A. Huot, M. Larivière-Bastien, M.-A. Langevin, B. Saute, A. De Champlain, X. Maldague	3J08: Microrreactor 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
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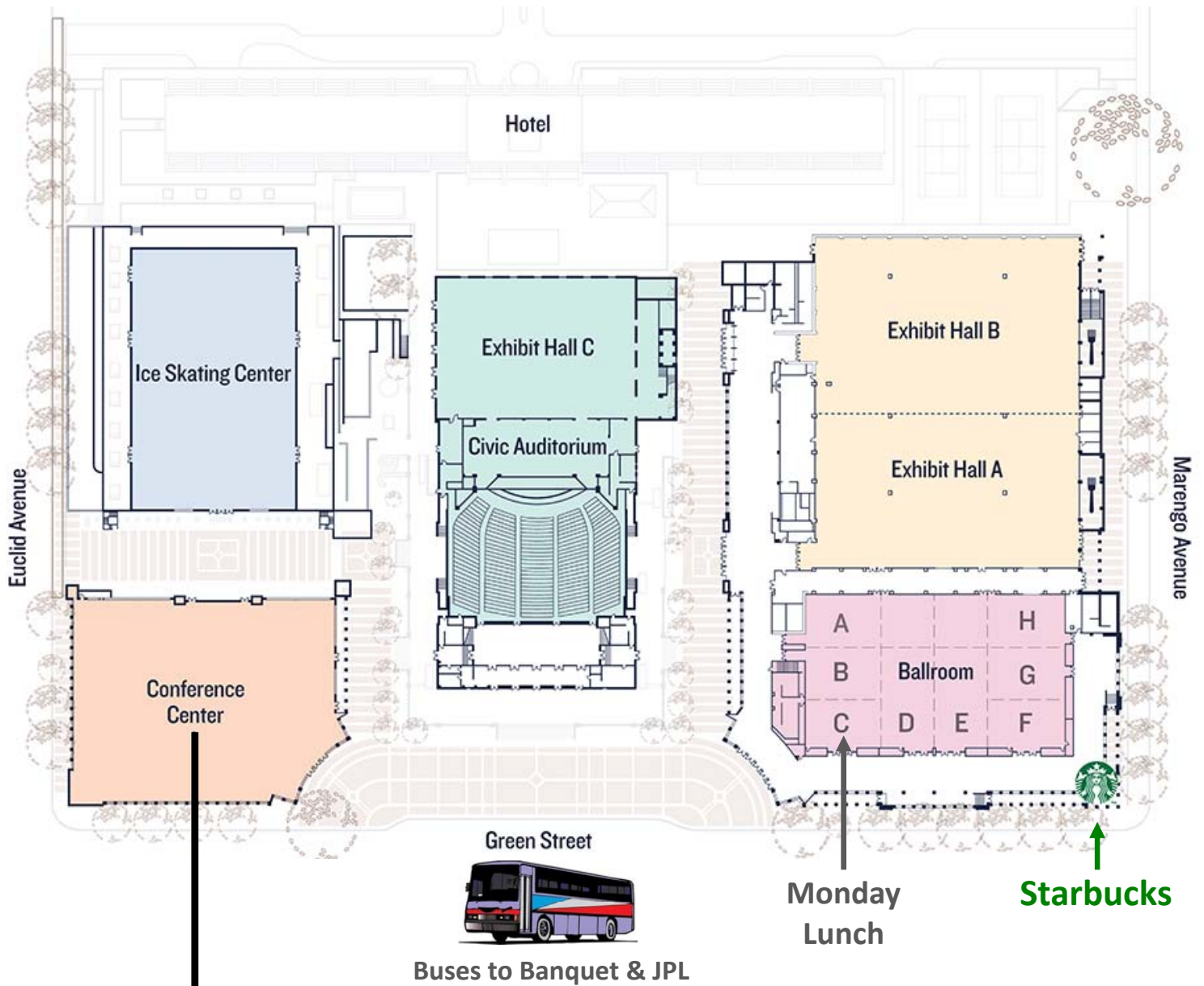
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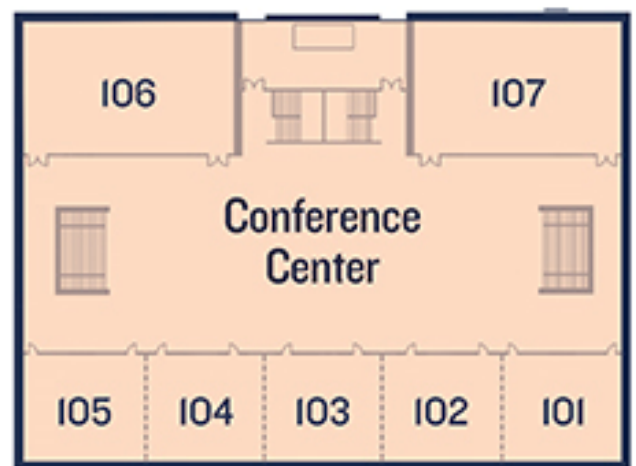
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