

13TH

U.S. NATIONAL COMBUSTION MEETING

MARCH 19 - 22, 2023 | TEXAS A&M UNIVERSITY | COLLEGE STATION, TEXAS

HOSTED BY

THE CENTRAL STATES SECTION OF THE COMBUSTION INSTITUTE

SPONSORS:



EXHIBITORS:





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13th United States National Combustion Meeting

MARCH 19 - 22, 2023
TEXAS A&M HOTEL AND CONFERENCE CENTER
College Station, Texas

The U.S. National Combustion Meeting has been organized biennially since 1999 by the joint US Sections of The Combustion Institute (the Western States Section or WSSCI, the Eastern States Section or ESSCI, and the Central States Section or CSSCI). The 13th U.S. National Combustion Meeting is being held in College Station, Texas in conjunction with Texas A&M University and hosted by the CSSCI. We expect more than 400 students, scientists, and engineers at this meeting, representing the leading edge of combustion research in the United States.

TAMU ORGANIZING COMMITTEE

- Eric Petersen
- Timothy Jacobs
- Waruna Kulatilaka
- Debbie Maggs

TAMU SUB-COMMITTEE MEMBERS

- Olivier Mathieu
- Elaine Oran
- Scott Jackson
- Dorrin Jarrahbashi
- Marcia Cooper
- Jacob McFarland
- James Chris Thomas

PROGRAM CHAIRS

- Steve Son, Chair, *Purdue University*
- Kalyan Srinivasan, Co-Chair, *University of Alabama*

HOSTED BY:





WELCOME TO COLLEGE STATION, TEXAS - HOME OF TEXAS A&M UNIVERSITY

On behalf of the Central States Section of the Combustion Institute, we welcome you to Texas A&M University for the 13th U.S. National Combustion Meeting. It has been a 4-year journey since our last face-to-face National Meeting. Over the past year, the host committee at Texas A&M and many others on and off campus have been working on preparations for the conference. The Program Chairs, Dr. Steve Son, Purdue University and Dr. Kalyan Srinivasan, University of Alabama, have been working tirelessly along with the Combustion Institute on a high-quality technical program that displays the breadth and depth of the important work that is currently being done in the United States (and internationally) in the combustion field. We are certain that you will find the content both enjoyable and enlightening. Over the next few days, we hope that you will find some time to also explore the Texas A&M campus as well as the surrounding communities of College Station and Bryan. If there is anything we can do to make your visit here as fruitful, educational, and uneventful as possible, please do not hesitate to reach out to any of the host committee members, the Turbomachinery Laboratory staff, or the many A&M graduate students who will be more than happy to assist.

Sincerely,

Host Committee:

Eric Petersen, Waruna Kulatilaka, Tim Jacobs, and Debbie Maggs
Texas A&M University



Join us for the Plenary Sessions

- MON, MARCH 20** 7:45 AM to 9:10 AM | CENTURY BALLROOM
OPENING COMMENTS:
Dr. Rob Tranter, Argonne National Laboratory, Chair, Central States Section of the Combustion Institute;
Dr. Waruna Kulatilaka, Texas A&M University, Chair-Elect, Central States Section of the Combustion Institute;
Dr. John E. Hurtado, Interim Vice Chancellor of Engineering and Interim Dean of the College of Engineering, Texas A&M University;
Dr. Eric Petersen, Local Host Chair, Texas A&M University
'Combustion: Clearing the Air on this (Not So) Dirty Word'
Kelly Senecal, Convergent Science
- TUES, MARCH 21** 8:00 AM to 9:10 AM | CENTURY BALLROOM
OPENING COMMENTS:
Dr. Eric Petersen, Local Host Chair, Texas A&M University
'Understanding Dynamics of Fire Growth: Challenges and Opportunities'
Stanislav Stoliarov, University of Maryland
- WED, MARCH 22** 8:00 AM to 9:10 AM | CENTURY BALLROOM
OPENING COMMENTS:
Dr. Eric Petersen, Local Host Chair, Texas A&M University
'Bridging Combustion Fundamentals to Applied Problems'
Derek Splitter, Oak Ridge National Laboratories;
Session Chair: *P. Papas*

The Combustion Institute is an international, non-profit, educational and scientific society. Founded in 1954, CI promotes and disseminates research activities in all areas of combustion science and technology for the advancement of many diverse communities around the world. The International Symposium on Combustion is its world congress and major biennial meeting.

The Combustion Institute directs the publication of two scientific journals, Combustion and Flame, published monthly and the Proceedings of The Combustion Institute, published biennially. Those publications and the affiliated journals, Progress in Energy and Combustion Science, Combustion Science and Technology, and Combustion Theory and Modeling link to all aspects of energy and combustion science both inside and outside the direct international combustion community.

The Combustion Institute also fosters a wide breadth of scientific activities, including regional scientific conferences, summer schools, lecture series, and stipend programs for early researchers. CI also maintains good relations with other scientific societies. Our international community is dedicated to combustion research as a field of eminent societal importance that cuts across many scientific and engineering disciplines.

<https://www.combustioninstitute.org/about-the-institute/mission/>



Review the items below or scan the QR code to access the online resources.



EXPLORE CAMPUS

WALK

Texas A&M University, or A&M for short, is full of tradition and historic statues, as well as picturesque views from the new Aggie Park to Kyle Field. You can have lunch atop Rudder Tower, go visit the “Ring” and learn about the university through a Aggie’s eyes.



DINING OPTIONS

UBER/WALK

College Station offers many dining options both on and off campus. You can find campus dining options at dineoncampus.com/tamu or click the QR code for more information.



CENTURY SQUARE

UBER/WALK

Several dining and shopping options are right across from Campus in a shopping center called Century Square. Parking in the garage is free, but there is a small free to park at the storefronts. Search “The George Hotel” to get there.



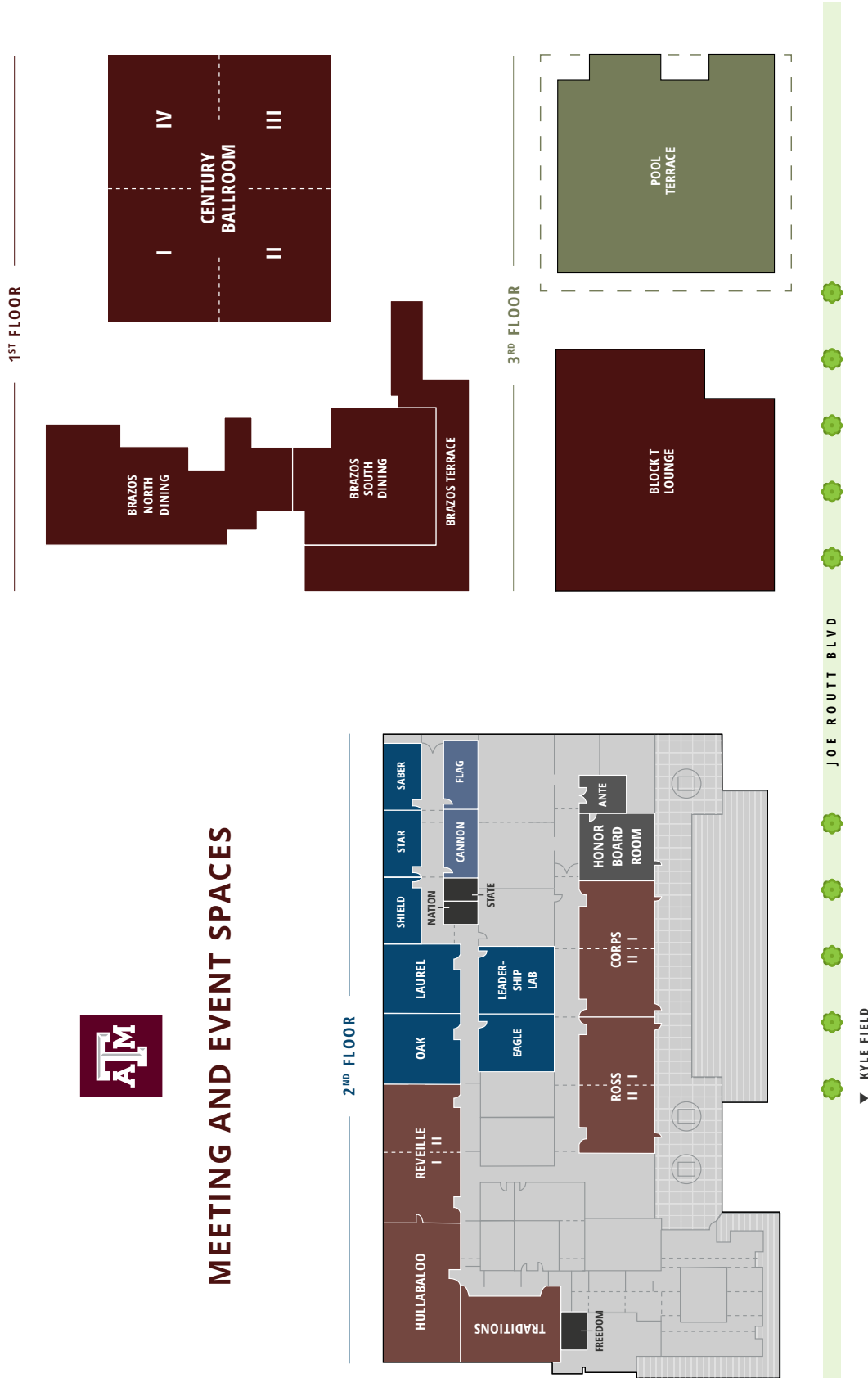
RESOURCES QR CODE

SCAN

Learn more on our website at <https://turbolab.tamu.edu/uscnm2023/> or scan the QR code with your phone.



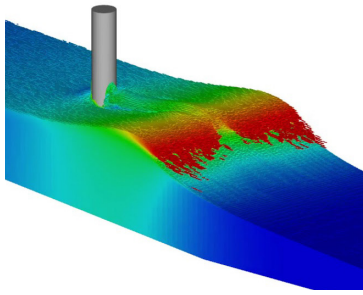
MEETING AND EVENT SPACES



From the TAMU Hotel and Conference Center Parking Garage: Enter the hotel via the skywalk on the 3rd floor of the garage. You will enter to the 2nd floor of the hotel. Registration for the Combustion Meeting will be directly in front of the garage entrance on the 2nd floor.

From the street-level/front of hotel: Take elevators to the 2nd Floor meeting rooms to find the Registration desk.

These additional workshops are being held at the 13th USNCM, the weekend prior to the meeting. You must be registered to attend.

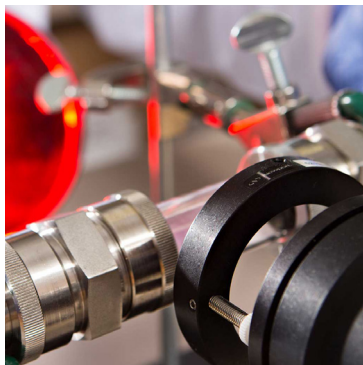


CHEMISTRY MODELING WITH CONVERGE WORKSHOP

SUNDAY

9:00 AM to 12:00 PM and 1:00 PM to 4:00 PM | TRADITIONS MEETING ROOM

CONVERGE is an innovative, multi-purpose computational fluid dynamics (CFD) software that can provide insight into many systems, including internal combustion engines, fuel injectors, sprays, aftertreatment systems, gas turbines, and electric vehicle components. The morning session of this workshop will cover how to set up these tools in CONVERGE Studio (the pre-processor for CONVERGE). The afternoon session will focus on strategies to effectively use these chemistry tools in CFD combustion simulations for various applications, including H₂ combustion.



COMBUSTION EARLY CAREER INVESTIGATOR WORKSHOP

SATURDAY & SUNDAY

8:00 AM to 5:00 PM Saturday, and 8:00 AM to 12:00 PM Sunday | REVELLE MEETING ROOM

This workshop will bring together junior faculty doing research in combustion, fire, and related fields, to discuss cultural issues facing the community. This workshop follows from the 2017 NSF-funded workshop titled “Sustaining the combustion research community: ensuring the field doesn’t burn out,” held in April 2017 ahead of the U.S. National Meeting in College Park MD, as well as the 2019 NSF-funded workshop titled “Support for Workshop and Mentoring of Junior Researchers at the U.S. National Combustion Meeting,” held in March 2019 ahead of the U.S. National Meeting in Pasadena, CA. The goals of these workshops included learning about and discussing future challenges in the field of combustion from the perspectives of early career researchers.

13th U.S. National Combustion Meeting

ADDITIONAL EVENTS

These additional networking events are being held at the 13th USNCM. You must be registered to attend.



WELCOME RECEPTION

SUNDAY

6:00 PM to 8:00 PM | CENTURY BALLROOM

Network with other attendees over light hors d'oeuvres and beverages. Must be registered to attend.



CAREER DEVELOPMENT AND MENTORING MIXER

MONDAY

6:30 PM to 8:00 PM | CENTURY BALLROOM

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

12:20 PM to 1:50 PM | LAUREL MEETING ROOM

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. This event will involve exchanges among female participants from academia, government, and industry on topics determined from a participant survey. Discussions will be facilitated through different break-out rooms and individual conversations. The ultimate goal is to learn from each other and create a sense of community where everyone can share their thoughts and ideas freely.

These additional networking events are being held at the 13th USNCM. You must be registered to attend the Banquet and Lab Tours.



COMBUSTION INSTITUTE BANQUET

TUESDAY

Taking place in the coveted Hall of Champions at Kyle Field, we are pleased to invite you to our Wednesday night Banquet. Entertainment and dinner will be provided. Badge required for entrance. The doors open at 6:45 pm, and the Hall can be accessed by a short walk from the front of the A&M Hotel.



TEXAS A&M COMBUSTION LABORATORIES TOUR

WEDNESDAY

11:00 PM to 12:00 PM and 1:30 PM to 3:00 PM

We will visit the laboratories within walking distance of the A&M Hotel and meeting, and then we will board a bus to tour the Turbomachinery Laboratory. Meet at the front of the A&M Hotel and Conference Center for departure. You must be registered to attend.

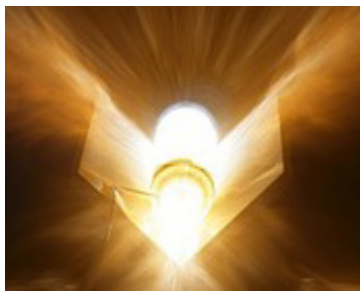


WORK IN PROGRESS POSTERS

MONDAY - WEDNESDAY

OUTSIDE CENTURY BALLROOM

Find the Work in Progress Posters set up throughout the event, outside of the lunch area (CENTURY BALLROOM). There are over 60 posters available for viewing. See the index for information.



ART COMPETITION

MONDAY - WEDNESDAY

OUTSIDE CENTURY BALLROOM

The art competition is hosted by the CSSCI and was organized this year by Ya-Ting T. Liao, Case Western Reserve University. Peer voting will occur throughout Monday and Tuesday, and the winners will be announced at the banquet on Tuesday evening. Be sure to vote for your favorite exhibits, based on two separate categories: artistic merit and technical merit. Find the art exhibits set up throughout the event, outside of the plenary lecture and lunch area (CENTURY BALLROOM).

2023 USNCM Undergraduate Research Competition Presentations

Congratulations to the winners of the 2023 USNCM Undergraduate Research Competition. Presentations will be held on Tuesday, March 21, 2023.



Winner Presentations

TUESDAY

2:10 PM - 3:00 PM | CENTURY BALLROOM

Presented by: Awards Committee Chair, Omid Samini-Abiameh

Awardees:

Dominic Curtis, *Yale University*

Jacob Klein, *Wayne State University*

James Ringsby, *Cornell University*



13th United States National Combustion Meeting

PROGRAM

PG. 13 - 31

13th U.S. National Combustion Meeting, Texas A&M University

Monday, 20 March 2023

Welcome and Opening Comments 7:45 – 8:00 (Century Ballroom)

Dr. John E. Hurtado, Interim Vice Chancellor of Engineering and Interim Dean of the College of Engineering, Texas A&M University
Central States Section Host Committee, 13th U.S. National Combustion Meeting

Monday Plenary 8:00 - 9:10 (Century Ballroom)

Combustion: Clearing the Air on this (Not So) Dirty Word

Kelly Senecal, Convergent Science

Session Chair: *Kalyan Srinivasan*

Transfer

9:10 – 9:15

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
09:15 – 09:35	Reaction Kinetics I Session Chair: <i>S.S. Goldsborough</i> <i>C. McEnally</i>	Fire I Session Chair: <i>R. Falkenstein-Smith</i> <i>S. Wessies</i>	Alternative Fuels & Emissions I Session Chair: <i>K. Cung</i> <i>H.A. Maldonado Colman</i>	Laminar Flames I Session Chair: <i>A. Saha</i> <i>O. Samimi</i> <i>Abianeh</i>	Diagnostics I Session Chair: <i>A. Ferris</i>	Detonations I Session Chair: <i>S.S. Dammati</i> <i>J. Zhang</i>	Multiphase I Session Chair: <i>S. Dasgappa</i> <i>S. Jackson</i>	Turbulent I Session Chair: <i>B. Perry</i>
09:35 – 09:55	LA01: The effect of 2,5-norbormadiene on the ignition of hydrogen and methane behind reflected shock waves <i>M.G. Sandberg,</i> <i>C.M. Grégoire,</i> <i>D.J. Mohr,</i> <i>E.L. Petersen</i>	IB01: A machine learning model to estimate material properties for fire modeling <i>K. Prasad</i>	IC01: Effects of sustainable fuels on the acoustics of a next generation N+3 combustor <i>D. Brouzet,</i> <i>D. McCormick,</i> <i>A. Reinanni,</i> <i>J. Mendoza, M. Ihme</i>	ID01: Understanding the impacts of the operating conditions on the stability limits of premixed methane-air combustion in micro-channels <i>A. Kutkut, M. Ayoobi,</i> <i>V. Akkerman,</i> <i>M.E. Baumgardner</i>	IE01: OH* chemiluminescence and OH-PLIF imaging studies of ignition phenomena of niacin dust clouds <i>P. Parajuli,</i> <i>C.V. Mashuga,</i> <i>W.D. Kulatilaka</i>	IF01: An investigation into the sensitivity of deflagration-to-detonation transition to ignition propensity and flame wrinkling <i>N. Dexter-Brown,</i> <i>J. Jayachandran</i>	IG01: Influence of spontaneous surface oxide decomposition on high temperature carbon oxidation rates <i>C.R. Shaaddix,</i> <i>B.S. Haynes</i>	IH01: Fractal characteristics of premixed ammonia/hydrogen/nitrogen-air flames in shear-driven turbulence <i>M. Rieth, A. Gruber,</i> <i>J.H. Chen</i>
09:35 – 09:55	LA02: Adaptive global pathway selection using artificial neural networks: A-priori study <i>R. Mishra, A. Nelson,</i> <i>D. Jarrabhashi</i>	IB02: A machine learning approach to predict the critical heat flux of solid fuels <i>J. Rivera,</i> <i>D. San Martin,</i> <i>M. Gollner,</i> <i>C. Fernandez-Pello</i>	IC02: Evaluation of minimum NO _x emission from ammonia combustion <i>S. Gubbi, R. Cole,</i> <i>B. Emerson,</i> <i>D. Noble, R. Steele,</i> <i>W. Sun, T. Liewwen</i>	ID02: Cool diffusion flames above a heptane pool <i>K.A. Waddell,</i> <i>H. Ju Lee,</i> <i>V. Nayagam,</i> <i>R.L. Aselbaun,</i> <i>P.B. Sunderland</i>	IE02: Krypton-based femtosecond two-photon-LIF thermometry in high-pressure flames <i>P. Parajuli, M. Hay,</i> <i>V.R. Katta,</i> <i>W.D. Kulatilaka</i>	IF02: High order wave mode phenomena in a radial rotating detonation engine with integrated aerospace <i>D. Langner,</i> <i>A. Gupta,</i> <i>A.K. Agrawal</i>	IG02: Transition metal catalysts for boron ignition and combustion <i>K.-I. A. Chintarsingh,</i> <i>M. Schoenitz,</i> <i>E.L. Dreizin</i>	IH02: Numerical simulations of turbulent non-premixed cool flames at supercritical/high pressures: Real-gas and pressure effects <i>S. Ramachandran,</i> <i>N. Srinivasan,</i> <i>H. Zhang,</i> <i>T.S. Taneja, S. Yang</i>

Room #	Hullabaloo Reaction Kinetics I Session Chair: <i>S.S. Goldsborough C. McEnally</i>	Traditions Fire I Session Chair: <i>R. Falkenstein-Smith S. Wessies</i>	Reveille 1 Alternative Fuels & Emissions I Session Chair: <i>K. Cung H.A. Maldonado Colman</i>	Reveille 2 Laminar Flames I Session Chair: <i>A. Saha O. Samimi Abianeh</i>	Corp 1 Diagnostics I Session Chair: <i>A. Ferris</i>	Corp 2 Detonations I Session Chair: <i>S.S. Dammati J. Zhang</i>	Ross 1 Multiphase I Session Chair: <i>S. Dasappa S. Jackson</i>	Ross 2 Turbulent I Session Chair: <i>B. Perry</i>
09:55 – 10:15	IA03: Chemical mechanisms of incineration for perfluorooctanoic acid <i>P.R. Westmoreland, C.C. Murphy, H. Ram, T.P. Sadej</i>	IB03: The self-heating ignition of lithium-ion batteries: A comparative study of COMSOL and GPYRO models with finite volume toolbox <i>S. Khan, M. Hasnain, A. Liaqat, V. Akkerman, H. Ahmed, S.P. Kozhumal, H. Sezer</i>	IC03: Investigation of global combustion characteristics of glycerol and ethanol blend in a lab-scale swirl-stabilized combustor using a novel Swirl Burst (SB) injector <i>S.M. Raftul Islam, D. Williams, I. Patel, L. Jiang</i>	ID03: Radiation effects in hydrofluorocarbon/air flames: Analysis and development of a spherical flame radiation model <i>J. Tavares, V. Gururajan, J. Jayachandran</i>	IE03: Laminar flame speed and emission spectra of ammonia spherical flames for an oxygenated mixture <i>Y.M. Almarzooq, M. Hay, M.A. Turner, W.D. Kulatilaka, E.L. Petersen</i>	IF03: Microscopic fluid jetting as the origin of detonation cell morphology <i>P.A. Meagher, X. Shi, A.S. Jayaraman, N. Kateris, X. Zhao, H. Wang</i>	IG03: Reactive Ni-Al composite powders with tunable morphology <i>J. McNamara, N. Levkulich, K.K. Miller, M. Gonzales, M. Schoenitz, E.L. Dreizin</i>	IH03: Turbulent combustion closure via physics-informed neural networks and multiscalar measurements <i>A. Taassob, R. Ranade, T. Echekki</i>
10:15 – 10:35	IA04: Shock-tube CO measurements during ethyl methyl carbonate combustion, a battery electrolyte <i>C.M. Grégoire, E.L. Petersen, O. Mathieu</i>	IB04: Flame retardancy behaviors of Zeolitic Imidazolate Frameworks (ZIFs) based polypropylene composites: A fire testing and diagnostics study <i>Y. Qian, R. Shen, C. Schweizer, P. Parajuli, Z. Zhang, W. Kulatilaka, Q. Wang</i>	IC04: An experimental investigation on the effects of reultrasonication on the stability of stored nanofuels <i>R. Mollick, N. Nagarkar, A. Ratnet</i>	ID04: Recent progress on numerical modeling for microgravity electric field flames <i>M. Donzeau, L. Esclapez, M.S. Day, Y.-C. Chien</i>	IE04: Laser absorption measurements of temperature and CO profiles in opposed-flow diffusion flames of solid propellants <i>A.J. McDonald, M.J. Baier, S.F. Son, M.J. McQuaid, C.-C. Chen, J.D. Veals, C.P. Stone, C.S. Goldenstein</i>	IF04: A numerical Deflagration to Detonation Transition (DDT) in micro-channels: Effects of vitiation and wall boundary conditions <i>S. Ramachandran, N. Srinivasan, Z. Wang, A. Behkish, S. Yang</i>	IG04: High-Resolution Differential Mobility Analysis (HR-DMA) of naturally charged platinum nanoparticles synthesized in two reactive spray deposition technology flames <i>F. Khosravi, E.K. Stefanidis, Z. Zeng, S. Bliznakov, L.J. Bonville, R. Maric, F. Carbone</i>	IH04: A data-based hybrid chemistry acceleration framework for complex fuels oxidation at low temperatures <i>S. Alqahtani, K.M. Gihushi, T. Echekki</i>

Break

10:35 – 11:00

Make sure to visit the Work in Progress Posters outside the Century Ballroom

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
11:00 – 11:20	Reaction Kinetics II <i>Session Chair:</i> <i>J. Cho</i> <i>R. Mishra</i>	Fire II <i>Session Chair:</i> <i>X. Ju</i>	Alternative Fuels & Emissions II <i>Session Chair:</i> <i>D. Dasgupta</i> <i>R. Rahman</i>	Laminar Flames II <i>Session Chair:</i> <i>M. Ayoubi</i> <i>F. Carbone</i>	Diagnostics II <i>Session Chair:</i> <i>Y.C. Mazumdar</i> <i>C. Schweitzer</i>	Detonations II <i>Session Chair:</i> <i>P. Meagher</i> <i>S. Yang</i>	Multiphase II <i>Session Chair:</i> <i>T. Hafner</i> <i>C. Saggese</i>	Turbulent II <i>Session Chair:</i> <i>J. Chen</i> <i>W.T. Chung</i>
	IA05: Automated generation of a chemical kinetic reaction mechanism for large alkane combustion <i>V. Amiri,</i> <i>R. Asatryan,</i> <i>M.T. Swihart</i>	IB05: Ratio pyrometry of emulsified firebrand streaks <i>J.H. Baldwin,</i> <i>P.B. Sunderland</i>	IC05: A numerical study on combustion and emissions of renewable diesel surrogate under engine-like conditions <i>P. Jha, K. Chung,</i> <i>E. Smith, T. Briggs,</i> <i>D.C. Bistis Jr.,</i> <i>Z. Abidin</i>	ID05: Low-light image denoising for acoustically coupled combustion <i>A. Hayrapetyan,</i> <i>A. Vargas,</i> <i>A.R. Karagozian</i>	IE05: Analysis of a time-resolved gas chromatography sampling diagnostic for species measurements in extended test-time shock tube experiments <i>A.M. Ferris,</i> <i>R.K. Hanson</i>	IF05: Simulating detonations with tabulated chemistry <i>A. Baumgard,</i> <i>M.X. Yao,</i> <i>G. Blaquart</i>	IG05: Mixing dynamics of liquid jets in supersonic crossflow <i>G. Holum, S. Biswas</i>	IH05: Partially non-equilibrium manifolds for turbulent combustion modeling with arbitrary chemical time scales <i>H. Maldonado Colmán,</i> <i>J.C. Armstrong,</i> <i>M.E. Mueller</i>
11:20 – 11:40	IA06: Shock-tube study of various lubricating oil ignition delay times <i>M. Abulail,</i> <i>S.P. Cooper,</i> <i>M.G. Sandberg,</i> <i>E.L. Petersen</i>	IB06: Ignition and burning behavior of individual and groups of live Douglas-fir needles <i>N. Gardner,</i> <i>D.L. Blumck</i>	IC06: Rapid compression machine autoignition of diisopropoxy-methane for gasoline additive use <i>S. Lucas, B. Windom</i>	ID06: Observation of different cool flame regimes in a diffusion burner <i>A. Thawko, Z. Wang,</i> <i>R. Sakamoto, N. Liu,</i> <i>Y. Ju</i>	IE06: In-situ x-ray diagnostics for mixing and temperature in coflow nonpremixed flames <i>C.S. McEnally,</i> <i>C. Baryon,</i> <i>A.L. Kastengen,</i> <i>H. Kwon,</i> <i>M.J. Montgomery,</i> <i>L.D. Pfefferle,</i> <i>T. Sikes,</i> <i>R.S. Tranter,</i> <i>Y. Xuan</i>	IF06: Lagrangian tracer particle analysis of the ethylene/air detonations <i>S.S. Dammati,</i> <i>C. Colby,</i> <i>A. Poludhenko</i>	IG06: Characterization of nascent soot particles from acetylene pyrolysis: A molecular modeling perspective <i>K.M. Mukut,</i> <i>A. Ganguly,</i> <i>E. Goudali,</i> <i>G. Kelesidis, S. Roy</i>	IH06: Characterization of a multi-regime burner configuration by Lagrangian particle tracking <i>L. Angelilli,</i> <i>P.P. Ciottoli, F.E. Hernandez-Perez,</i> <i>M. Valorani,</i> <i>H.G. Im</i>
11:40 – 12:00	IA07: Reaction mechanisms of alkyloxiranes for combustion modeling <i>N.S. Dewey,</i> <i>B. Rotavera</i>	IB07: Avoiding cascading failure in battery packs through thermal analysis <i>A. Kurzawski,</i> <i>J. Hewson</i>	IC07: A numerical study of soot and NOx emissions in ammonia blended ethylene counterflow diffusion flames with oxygen-enrichment <i>R. Suresh,</i> <i>K.C. Kalvakala,</i> <i>S.K. Aggarwal</i>	ID07: Polyhedral Bunsen flames: Regimes and morphologies <i>Y. Weng, A. Poinis,</i> <i>A. Saha</i>	IE07: Thermometry and velocity in a ramjet using dual comb spectroscopy measurements of the O ₂ a-band <i>D. Yun, W. Sabin,</i> <i>S. Coburn,</i> <i>N. Foghooghi,</i> <i>J. France,</i> <i>M. Hagenmaier,</i> <i>K. Rice, J. Donbar,</i> <i>G. Rieker</i>	IF07: Effects of thermal diffusion and turbulence on detonation development of hydrogen/air mixtures under engine-relevant conditions <i>J. Zhang,</i> <i>M.B. Luong,</i> <i>H.G. Im</i>	IG07: Plasma-assisted chemical-looping combustion: Low-temperature ethylene oxidation with CuO and NiO <i>C. Burger, A. Zhang,</i> <i>N. Hansen, Y. Ju</i>	IH07: Simulation of a jet flame with inhomogeneous inlets using tabulated and neural network manifold models <i>B.A. Perry, K. Eiden,</i> <i>M.T.H. de Frahan,</i> <i>S. Yellapantula,</i> <i>L. Esclapez,</i> <i>M.E. Mueller,</i> <i>M.S. Day</i>

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
12:00 – 12:20	Reaction Kinetics II <i>Session Chair:</i> <i>J. Cho</i> <i>R. Mishra</i> 1A08: A shock-tube laser-schlieren study of iso-propanol pyrolysis <i>J.H. Kim, C. Banyon, K. Kim, M.S. Wooldridge, R.S. Tranter</i>	Fire II <i>Session Chair:</i> <i>X. Ju</i> 1B08: Modeling of flame spread along wire utilizing an artificial neural network and a genetic algorithm <i>C.A. Scudiere, L.B. Gagnon, V.P. Carey, A.C. Fernandez-Pello</i>	Alternative Fuels & Emissions II <i>Session Chair:</i> <i>D. Dasgupta</i> <i>R. Rahman</i> 1C08: An extended-wavelength FTIR spectra-based prescreening approach for the prediction of physical and chemical properties of alternative jet fuels <i>V. Boddapati, A.M. Ferris, R.K. Hanson</i>	Laminar Flames II <i>Session Chair:</i> <i>M. Ayoobi</i> <i>F. Carbone</i> 1D08: Characteristics of H ₂ -O ₂ -N ₂ flame in quasi-2D channels: Propagation rates and scaling parameters <i>Z. Zhou, S. Shen, J. Weiss, P. Romney</i>	Diagnostics II <i>Session Chair:</i> <i>Y.C. Mazumdar</i> <i>C. Schweitzer</i> 1E08: High-speed velocity measurements with mid-infrared electro-optic modulator dual comb spectroscopy <i>C. Mathurin, D.A. Long, G.C. Mathews, M.J. Cich, A.T. Heiniger, T. Souders, A. Frymire, P.E. Hamlington, G.B. Rieker</i>	Detonations II <i>Session Chair:</i> <i>P. Meagher</i> <i>S. Yang</i> 1F08: Spectral characterization of overdriven irregular detonations <i>S. Ramachandran, N. Srinivasan, S. Yang</i>	Multiphase II <i>Session Chair:</i> <i>T. Hafner</i> <i>C. Saggese</i> 1G08: Empirical trends in the sooting tendencies of non-cyclic alkanes and their basis in chemical kinetics <i>D.A. Curtis, S. Kim, C.S. McEnally, S. Mohammed, L.D. Pfefferte, J. Zhu</i>	Turbulent II <i>Session Chair:</i> <i>J. Chen</i> <i>W.T. Chung</i> 1H08: Using tabulated chemistry to capture non-unity Lewis number effects in turbulent premixed flames <i>M.X. Yao, G. Blaquart</i>

Lunch Break ESSCI, CSSCI, WSSCI Board Meetings
Boxed Lunches provided by the Sections

12:20 - 13:50

Transfer

13:50 – 14:00

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J. Mike Walker '66 Department of Mechanical Engineering

TEES Turbomachinery Laboratory

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
14:00 – 14:20	Reaction Kinetics III <i>Session Chair:</i> <i>R. Choudhary</i> <i>R. Schwind</i>	Fire III <i>Session Chair:</i> <i>K. Prasad</i> <i>G. Xiong</i>	Alternative Fuels & Emissions III <i>Session Chair:</i> <i>F. Haas</i> <i>H.A. Maldonado Colman</i>	Laminar Flames III <i>Session Chair:</i> <i>J. Jayachandran</i>	Diagnostics III <i>Session Chair:</i> <i>D. Pineda</i> <i>S. Reggati</i>	Detonations III <i>Session Chair:</i> <i>S. Ramachandran</i> <i>X. Shi</i>	Multiphase III <i>Session Chair:</i> <i>M. Cooper</i>	Turbulent III <i>Session Chair:</i> <i>A. Novoselov</i> <i>A. Steinberg</i>
	1A09: Jet-stirred reactor experiments as corroborations for the HNNO pathway to NO _x formation <i>J. Lee, M.C. Barbet, Q. Meng, R.E. Cornell, M.P. Burke</i>	1B09: Developing adaptive mesh refinement capabilities for FireFOAM: Application in simulating compartment and façade fires <i>X. Lu, N. Ren, Y. Wang</i>	1C09: The effects of ammonia substitution in the fuel stream and EGR on extinction limits of non-premixed methane- and ethylene-air counterflow flames <i>C. Chu, P. Liu, R.A. Serrano Bayona, F. Aydin, T. Gutberlet, W.L. Roberts</i>	1D09: Novel method for measuring laminar flame speed of lubrication oil mist in air <i>J.E. Jacobs, M.A. Turner, E.L. Petersen</i>	1E09: Ignition phenomena of CO ₂ -diluted syngas at elevated pressures in a shock tube <i>D.J. Mohr, S.P. Cooper, M.K. Hay, W.D. Kulatilaka, E.L. Petersen</i>	1F09: Numerical study of fuel droplet combustion under heterogeneous detonation conditions <i>B.J. Musick, M. Paudel, J.A. McFarland</i>	1G09: Viability assessments of biodiesel surrogate and ethane for hydrogen and carbon black production via thermal plasma <i>R. Lawson, S. Dasappa, E. Wyse, E. Dames</i>	1H09: Data assimilation for reacting flows: Deep learning PDE models to augment turbulent combustion simulations <i>P.R. Kakka, J.F. MacArt</i>
14:20 – 14:40	1A10: High-temperature thermal breakdown of gas turbine lubricating oils <i>R. Juarez, N. Gutierrez, E.L. Petersen</i>	1B10: Modeling water mist suppression of enclosure fires <i>N. Ren, H.-Z. Yu, Y. Wang, S. Dorofeev</i>	1C10: Reactor network analysis with various reaction mechanisms to investigate hydrogen vs. methane fuel at varying flame temperatures with experimental data <i>B. Tran, V. McDonell</i>	1D10: Numerical and experimental study of autoignition-assisted premixed <i>n</i> -heptane flames using RCM-Flame apparatus <i>T. Goyal, J. Klein, O. Samimi-Abianeh</i>	1E10: Design characteristics of a fast-acting driver valve for a diaphragm-free shock tube <i>M. Tomar, M. Burch, J.P. Chethalan, J. Komperda, P. Lynch</i>	1F10: The interaction of a bow shock and a detonation: A focus on vorticity generation <i>A.S. Venkataraman, E.S. Oran</i>	1G10: Nanostructure of carbon nanoparticles formed in high-temperature premixed flames <i>S. Dasappa, J. Camacho</i>	1H10: The influence of scalar dissipation rate fluctuations on turbulent premixed flames at varying Karlovitz number <i>K. VanderKam, M.E. Mueller</i>
14:40 – 15:00	1A11: An experimental and kinetic modeling study of 2,2,3-, 2,2,4- and 2,3,4-trimethylpentane <i>Y. Heng, G. Kenny, P. Wang, S. Dong, M.K. Ghosh, G. Li, J. Liang, H.J. Curran</i>	1B11: Experimental studies on the heat flux of individual firebrands <i>A.E. Mensch, S.S. Westies, A. Hamins, J.C. Yang</i>	1C11: Image characterization of reactions generated by an aeroengine micromixing injector for lean direct injection of hydrogen and hydrogen/natural gas blends <i>I. Gomez Escudero, V. McDonell</i>	1D11: Effect of products of catalytic oxidative coupling on the laminar burning velocity of methane <i>M.N. Nasim, B. Nawaz, S.K. Das, J.H. Mack</i>	1E11: Heat transfer corrections of thermocouple measurements using synchrotron x-ray fluorescence <i>K. Kim, T. Sikes, C. Banyon, A.L. Kastengren, M.J. Montgomery, C.S. McEnally, L.D. Pfeifferle, R.S. Tranter</i>	1F11: Scaling and attenuation of shocks transmitted from detonation tubes <i>J.C. Thomas, F.A. Rodriguez, E.T. Balci, G.N. Gaddis, S.I. Jackson, E.L. Petersen, E.S. Oran</i>	1G11: Analysis of thermal radiation of a gas-particulate-cloud in a pressurized oxy-coal combustor <i>L. Li, V. Akkerman, D. Magalhaes, Z. Yang, R.L. Axelbaum</i>	1H11: Analysis of cross-scale turbulent kinetic energy transfer in swirl flames up to Karlovitz number 100 by deconvolution of tomographic PIV data <i>A. Kazbekov, A. Bhagat, A. Steinberg</i>

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
15:00 – 15:20	Reaction Kinetics III <i>Session Chair:</i> <i>R. Choudhary</i> <i>R. Schwind</i>	Fire III <i>Session Chair:</i> <i>K. Prasad</i> <i>G. Xiong</i>	Alternative Fuels & Emissions III <i>Session Chair:</i> <i>F. Haas</i> <i>H.A. Maldonado</i> <i>Colman</i>	Laminar Flames III <i>Session Chair:</i>	Diagnosics III <i>Session Chair:</i> <i>D. Pineda</i> <i>S. Reggeti</i>	Detonations III <i>Session Chair:</i> <i>S. Ramachandran</i> <i>X. Shi</i>	Multiphase III <i>Session Chair:</i> <i>M. Cooper</i>	Turbulent III <i>Session Chair:</i> <i>A. Novoselov</i> <i>A. Steinberg</i>
	1A12: NTC behavior of tetrahydrofuran and conjugate alkene isomers 3,4-dihydro-2H-pyran and 3,6-dihydro-2H-pyran <i>S. Harmess,</i> <i>M. Preußker,</i> <i>A. Heufer,</i> <i>B. Rotavera</i>	1B12: 3D mathematical model for heat and mass transfer mechanisms in gypsum board exposed to fire <i>M. Hasnain, R. Paye,</i> <i>J. Casa, T. Borth,</i> <i>G.E. Gorbett,</i> <i>S.P. Kozhumal,</i> <i>H. Sezer</i>	1C12: Development of a NOx formation test facility for lean premixed methane-hydrogen-air flames <i>C. Godbold,</i> <i>B. Bree,</i> <i>H.P. Rajagopalan,</i> <i>J. Miller, R. Bond,</i> <i>B. Emerson, D. Wu,</i> <i>V. Acharya,</i> <i>D. Noble,</i> <i>T. Lienwen</i>	1D12: High-temperature ammonia flame speed measurements behind reflected shock waves <i>M. Figueroa-Labastida, L. Zheng,</i> <i>A.M. Ferris,</i> <i>R.K. Hanson</i>	1E12: Simultaneous detection of NO, O, OH, CH, and O ₂ using a single broadband femtosecond laser system in atmospheric-pressure methane-air flames <i>M. Hay, P. Parajuli,</i> <i>W. Kulatilaka</i>	1F12: Explorations on reduced order models for 2D detonation wave <i>R. Camacho,</i> <i>C. Huang</i>	1G12: Solution combustion synthesis of iron-based alumina catalysts for dehydrogenation of fossil fuels <i>Z. Chanoi, V. Reyes,</i> <i>E. Shafirovich</i>	1H12: Flame stabilization of sustainable aviation fuels at gas turbine relevant conditions <i>B.S. Soriano,</i> <i>L. Owen, J. Chen</i>
15:20 – 15:40	1A13: A shock tube study of fuel concentration and NO addition effects on high-pressure autoignition delay of ammonia <i>Y. Peng, W. Sun</i>	1B13: A numerical study on the effects of pressure, oxygen, and normoxic conditions on the burning behavior of large thin solid samples in microgravity <i>W. Cui, Y.-T. Liao</i>		1D13: Dynamics of acoustically excited coaxial laminar jet diffusion flames <i>A. Vargas,</i> <i>A. Hayrapetyan,</i> <i>A. Karagozian</i>	1E13: A Raman spectroscopy based chemometric approach to predict the derived cetane number of hydrocarbon jet fuels <i>D. Ambre,</i> <i>M. Sheyyab,</i> <i>P. Lynch,</i> <i>E.K. Mayhew,</i> <i>K. Brezinsky</i>	1F13: The research and motor octane numbers of Liquefied Petroleum Gas (LPG) and Dimethyl Ether (rDME) blends <i>R. Churchill,</i> <i>G. Vishwanathan,</i> <i>D. Olsen,</i> <i>B. Windom</i>	1G13: Spectral emissivity of burning iron particles <i>Y. Yao, A. Panahi,</i> <i>Y.A. Levendis</i>	1H13: Effects of turbulence and mean pressure gradients on the recirculation region of a bluff body stabilized flame <i>T.J. Souders,</i> <i>S.H.R. Whitman,</i> <i>M.A. Meelan,</i> <i>P.E. Hamlington</i>
Break 15:40 – 16:10								
Make sure to visit the Work in Progress Posters outside the Century Ballroom And please visit our exhibitors outside the Century Ballroom: Southwest Research Institute (SWRI) Telops								

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
16:10 – 16:30	Reaction Kinetics IV <i>Session Chair:</i> C. Gregoire O. Mathieu	Fire IV <i>Session Chair:</i> P. Deslardin Y. Kim	Alternative Fuels & Emissions IV <i>Session Chair:</i> P. Lynch Z. Zhou	Laminar Flames IV <i>Session Chair:</i> Y.-C. Chien Z. Wang	Diagnosics IV <i>Session Chair:</i> M. Hay	Energetic Materials I <i>Session Chair:</i> J.C. Thomas	IC Engines I <i>Session Chair:</i> K. Bopalah S.-C. Kong	Turbulent IV <i>Session Chair:</i> M. Mueller S. Trivedi
16:30 – 16:50	IA14: Soot formation of iso-dodecane and normal-dodecane in counterflow non-premixed flames <i>T. Chatterjee, C. Saggese, X. Xue, G. Kukkadapu, W.J. Pitz, S.W. Wagnon, C.-J. Sung</i>	IB14: Experimental and modeling study of thermal runaway propagation of 18650 form factor lithium-ion battery array <i>D. Zeng, L. Gagnon, Y. Wang</i>	IC14: Performance enhancement of a hydrogen spark-ignition engine with ammonia blending <i>H. Ge, A.H. Bakir, P. Zhao</i>	ID14: The structure of an incipiently sooting Planar Mixing Layer (PML) diffusion flame <i>M. Ashour, F. Carbone</i>	IE14: Measurements of combustion intermediates in sooting environments using quantum-cascade-laser dual-comb spectroscopy in a shock tube <i>R.K. Rahman, F. Arafin, R. Horvath, M. Geiser, S. Vasu</i>	IF14: Effects of reactivity and thermal transport on burning propagation of nanothermites <i>S. Kim, A. Wang, J.Z. Wen, S. Deng</i>	IG14: Physics-integrated Segmented Gaussian Process (SegGP) learning for cost-efficient training of diesel engine control system with low cetane numbers <i>S.R. Narayanan, Z. Sun, S. Yang, Y. Ji, S. Mak, H.D. Saprta, S. Kokjohn, K.S. Kim, C.-B.M. Kweon</i>	IHI4: A physics-informed deep learning approach to predict spatiotemporal fluid flow dynamics <i>P. Sharma, W.T. Chung, M. Ihme</i>
16:30 – 16:50	IA15: Probing O ₂ -dependence of cyclopentyl reactions via isomer-resolved speciation <i>A.R. Webb, S.W. Harness, N.S. Dewey, M.G. Christianson, A.C. Doner, A.L. Koritzke, B. Rotavera</i>	IB15: SootLib: A library for modeling soot formation in combustion systems <i>D.O. Lignell, Y.B. Stephens, J. Bedwell, A.J. Josephson, K. Oldham</i>	IC15: Compositional effect of multi-component gasoline on the ϕ -sensitivity of ignition delay time <i>J. Cho, S. Cheng, S.S. Goldsborough, S. Kim</i>	ID15: Vortex breakdown in non-premixed swirling jet flames <i>B.W. Keeton, K.K. Nomura, A.L. Sanchez, F.A. Williams</i>	IE15: Quantitative assessment of phosphor thermometry intrusiveness for metal surface temperature measurements in reciprocating engines <i>D. Witkowski, E.R. Amezcua, D.A. Rothamer</i>	IF15: Laser ignition of solid fuels in an oxygenated environment <i>F.A. Rodriguez, J.C. Thomas, E.L. Petersen</i>	IG15: Combustion dynamics of single- vs multi-flame burners in a Rijke tube <i>P. Finn, Y. Weng, A. Saha</i>	IHI5: Computational evaluation of a new jet-stirred reactor for chemical kinetics studies <i>J.-Y. Wang, P.D. Ronney</i>

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Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
16:50 – 17:10	Reaction Kinetics IV <i>Session Chair:</i> C. Gregoire O. Mathieu	Fire IV <i>Session Chair:</i> P. DesJardin Y. Kim	Alternative Fuels & Emissions IV <i>Session Chair:</i> P. Lynch Z. Zhou	Laminar Flames IV <i>Session Chair:</i> Y.-C. Chien Z. Wang	Diagnostics IV <i>Session Chair:</i> M. Hay	Energetic Materials I <i>Session Chair:</i> J.C. Thomas	IC Engines I <i>Session Chair:</i> K. Bopaiath S.-C. Kong	Turbulent IV <i>Session Chair:</i> M. Mueller S. Trivedi
17:10 – 17:30	1A16: A shock tube and laser absorption study of NH ₃ oxidation S. Clees, T.M. Rault, M. Figueroa-Labastida, S.C. Barnes, A.M. Ferris, R.K. Hanson	1B16: Cell-level thermal runaway behavior of large-format Li-ion pouch cells L. Gagnon, D. Zeng, Y. Wang	1C16: Experimental investigation of thermal resilience and reight behavior of ammonia/hydrogen /air flames in a novel porous media burner G. Vignat, E.R. Toro, T. Zirwes, E. Boigné, D. Trimis, M. Ihme	1D16: Experimental study of undiluted oxy-methane laminar flame speeds M.A. Turner, E.-L. Petersen	1E16: In-situ laser diagnostics of Iridium nanoparticles during their synthesis in a turbulent diffusion flame of the reactive spray technology E.K. Stefanidis, Z. Zeng, T.A. Ebaugh, S. Bliznakov, L.J. Bomville, R. Maric, F. Carbone	1F16: Combustion of lithium and magnesium powders for generation of heat and electricity in space missions S. Cordova, K. Estala-Rodriguez, E. Shafirovich	1G16: Practical pre-ignition introduction of radical species using a radical-generating pre-combustion chamber for main chamber seeding K. Beurlot, T.J. Jacobs, G. Vieira, D. Olsen, M. Patterson	1H16: Deep learning model for the instantaneous dissipation rate profiles in multi-modal turbulent combustion C.E. Lacey, M. Riehl, J.H. Chen, M.E. Mueller
17:10 – 17:30	1A17: Uncertainty minimization for an Alcohol-To-Jet (ATJ) combustion reaction model Y. Zhang, W. Dong, G. Smith, H. Wang	1B17: Extinction of buoyant turbulent diffusion flames under reduced oxygen concentrations G. Xiong, R. Barlow, D. Zeng, Y. Wang	1C17: Investigation of the combustion process and modes of energy-assisted compression-ignition for low cetane number sustainable aviation fuels E.R. Amezcua, K. Kim, C.-B.M. Kweon, D.A. Rothamer	1D17: Laminar flame speed measurements of p-cymene at elevated temperature and pressure N. Lindblade, E.L. Petersen	1E17: High-speed laser absorption measurements of carbon oxides in linear detonation channels K.L. Fetter, B.R. Steavenson, B.M. Ng, A. Andrade, C.S. Combs, D.I. Pineda, J.W. Bennewitz, J.R. Burr, B.R. Bigler	1F17: Experimental investigation of temperatures of aluminum particles F. Halter, V. Glasziou, H. Keck, G. Legros, C. Chauveau	1G17: Performance and emissions of ammonia spark-assisted compression ignition in a single-cylinder engine S.A. Reggei, S. Kane, W. Northrop	1H17: Extinction behavior of partially premixed flames and nonpremixed flames in turbulent counterflow F.M. Pereira, F. Carbone, J.H. Frank, B. Coriton, P. Wang, A. Gomez
Career Development and Mentoring Mixer 18:30 – 20:00 End of Day								

Tuesday, 21 March 2023

Announcements (Century Ballroom)

Eric Petersen, Local Host, 13th U.S. National Combustion Meeting

Tuesday Plenary 8:00 - 9:10 (Century Ballroom)

Understanding Dynamics of Fire Growth: Challenges and Opportunities

Stanislav Stoliarov, University of Maryland

Session Chair: Steven Son

Transfer - 9:10 - 9:15

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
09:15 - 09:35	Reaction Kinetics V <i>Session Chair: S. Roy R. Sivaramakrishnan</i> 2A01: Improvements to non-adiabatic statistical theories: Application to N ₂ O decomposition <i>C.R. Muñihill, Y. Georgievskii, S.J. Klippenstein</i>	Fire V <i>Session Chair: S. Hossain</i> 2B01: Accommodating physical reaction schemes in DSC cathode thermal stability analysis using chemical reaction neural networks <i>B.C. Koenig, P. Zhao, S. Deng</i>	Alternative Fuels & Emissions V <i>Session Chair:</i> 2C01: Large eddy simulation of turbulent nonpremixed sooting flames: Evolution of the soot size distribution using the bivariate multi-moment sectional method <i>H. Maldonado Colmán, M.E. Mueller</i>	Laminar Flames V <i>Session Chair: E. Antar M. Turner</i> 2D01: Extinction of counterflow diffusion flames with diluted ammonia-hydrogen fuel <i>D.E. Thomas, J.C. Jarosz, P.L.L. Walls</i>	Diagnostics V <i>Session Chair: O. Samimi-Abiane K. Waddell</i> 2E01: Visualization of compression ignition of dimethyl ether in an optical rapid expansion and compression machine <i>A. Dhote, S. Biswas</i>	Energetic Materials II <i>Session Chair: K.L. Chintersingh A. Demko</i> 2F01: Dynamic measurement of internal strain on composite solid propellant constituents during laser induced combustion <i>A.R. Demko, A. Jimenez-Thomas, M. Karimi</i>	IC Engines II <i>Session Chair: F. Chuahy J.-W. Park</i> 2G01: Prediction of derived cetane number using only UNIFAC group compositions of hydrocarbon mixtures and jet fuels with machine learning <i>M. Sheyyab, P.T. Lynch, E.K. Mayhew, K. Brezinsky</i>	Turbulent V <i>Session Chair:</i> 2H01: On modern lean direct injection mixer's data and turbulence chemistry interaction simulations <i>K. Twarog, C.J. Sung, H.C. Mongia</i> 2H02: Learning combustion closure models from an open-source DNS database <i>W. Tong Chung, M. Ihme</i>
09:35 - 09:55	2A02: A study on the initial decomposition of difluoromethane (CH ₂ F ₂) using laser absorption spectroscopy in a miniature shock tube <i>R.A. Shaik, A.W. Jasper, R. Sivaramakrishnan, R.S. Tranter, P.T. Lynch</i>	2B02: Enabling exposure comparison for firebrand showers generated during wildland-urban interface (WUI) fires <i>N. Bouvet, E.D. Link, S.S. Wessies, S.A. Fink</i>	2C02: Systematically derived reduced kinetics for high-pressure H ₂ -NH ₃ combustion <i>B. Li, D. Fernández-Galisteo, A.L. Sánchez, F.A. Williams</i>	2D02: Structures, extinction limits, and reactivities of <i>n</i> -dodecane diffusion cool flames at high pressures <i>Z. Wang, A. Thawko, B. Mei, C.K. Law, Y. Ju</i>	2E02: Experimental n-pentane autoignition investigation using corrected filtered natural emission of species (C-FNES) <i>M. Molana, O. Samimi-Abiane</i>	2F02: Improving performance of ammonium nitrate as an oxidizer for boron <i>P. Mehlkumar Gandhi, M. Schoenitz, E.L. Dreizin</i>	2G02: Examination of a methane/diesel RCCI engine using Pele <i>N.T. Wimer, L. Escalpez, M.H. de Frahan, M. Rahimi, M. Hassanaly, B. Perry, J. Rood, S. Yellapantula, H. Sitaraman, M. Martin, O. Doronina, S. Nadakkal Appukkuttan, M. Reith, M. Day</i>	

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
09:55 – 10:15	Reaction Kinetics V Session Chair: <i>S. Roy</i> <i>R. Sivaramakrishnan</i>	Fire V Session Chair: <i>S. Hossain</i>	Alternative Fuels & Emissions V Session Chair: 	Laminar Flames V Session Chair: <i>E. Antar</i> <i>M. Turner</i>	Diagnostics V Session Chair: <i>K. Waddell</i>	Energetic Materials II Session Chair: <i>K.L. Chintersingh</i> <i>A. Demko</i>	IC Engines II Session Chair: <i>F. Chuahy</i> <i>J.-W. Park</i>	Turbulent V Session Chair:
	2A03: Probing O ₂ -dependence of 1-hydroxybutyl reactions via isomer-resolved speciation <i>M. Christianson,</i> <i>A. Koritzke,</i> <i>A. Doner,</i> <i>N. Dewey,</i> <i>S. Hartmess,</i> <i>A. Webb,</i> <i>B. Rotavera</i>	2B03: Classification of airborne firebrand combustion state using a convolutional neural network <i>S.S. Westies,</i> <i>N. Bouvet,</i> <i>E.D. Link</i>	2C03: CFD evaluation of sustainable aviation fuel blends for commercial supersonics technology <i>K. Ajmani,</i> <i>J.P. Moder</i>	2D03: Diffusive-thermal instabilities in unstrained H ₂ -CH ₄ -CO diffusion flames diluted with H ₂ O and CO ₂ <i>E. Antar,</i> <i>E. Robert</i>	2E03: Single-camera time-resolved laser-induced incandescence measurements in a RQL aeroengine combustor <i>R. McGrath,</i> <i>E.M. Bugay,</i> <i>J. Juergensmeyer,</i> <i>A.X. Zheng,</i> <i>D. Wu,</i> <i>A. Steinberg,</i> <i>W. Sun,</i> <i>Y.C. Mazumdar</i>	2F03: The effect of porosity on flexoelectricity in fluoropolymer/aluminum films <i>T.A. Hahner,</i> <i>M. Ornek,</i> <i>D.N. Collard,</i> <i>D.K. Messer,</i> <i>C.T. Nimes,</i> <i>M.W. Paral,</i> <i>S.F. Son</i>	2G03: Combustion phasing and emission characteristics of HCCI fueled by ammonia/hydrogen <i>A. Hadi Bakir,</i> <i>H. Ge, P. Zhao</i>	2H03: Computational cost improvements for in-situ adaptive manifolds for turbulent combustion modeling <i>I.J. Bonilla,</i> <i>C.E. Lacey,</i> <i>M.E. Mueller</i>
10:15 – 10:35	2A04: Updating rate rules to describe the low temperature oxidation of <i>n</i> -butane, <i>iso</i> -butane, <i>n</i> -pentane and <i>iso</i> -pentane <i>P. Wang, Y. Heng,</i> <i>S. Dong,</i> <i>H.J. Curran</i>	2B04: Can “Fire Safe” Cigarettes (FSCs) start wildfires? <i>S. McAllister,</i> <i>S. Williams,</i> <i>I. Grob</i>	2C04: Shock-wave reforming for clean H ₂ production: a theoretical analysis of reaction kinetics and gas dynamic <i>A.M. Ferris,</i> <i>R.K. Hanson</i>	2D04: Determining the species profiles and flame characteristics for CH ₄ -CO ₂ -O ₂ laminar jet flame near methane autothermal reforming condition <i>P. Liu,</i> <i>R. Serrano-Bayona,</i> <i>E.-t. Es-sebbar,</i> <i>W.L. Roberts</i>	2E04: X-ray fluorescence measurements of methane flames with trimethylsilanol and hexamethyldisiloxane dopants in a multi-element diffusion burner <i>Q. Meng,</i> <i>C. Banyon,</i> <i>K. Kim, J. Kim,</i> <i>A.L. Kastengren,</i> <i>M.S. Wooldridge,</i> <i>R.S. Tranter</i>	2F04: Experimental investigation of liquid propellant vaporization temperatures and rates at elevated pressures <i>R.A. Schwind,</i> <i>C.F. Goldsmith</i>	2G04: Estimation of chemical functional group compositions in jet fuels from IR Spectra using ML models <i>A. Dalmya,</i> <i>J.M. Mehta,</i> <i>M. Sheyyab,</i> <i>E.K. Mayhew,</i> <i>K. Brezinsky,</i> <i>P.T. Lynch</i>	

Break

10:35 – 11:00

Make sure to visit the Work in Progress Posters outside the Century Ballroom

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
11:00 – 11:20	Reaction Kinetics VI <i>Session Chair:</i> <i>P. Westmoreland</i>	Fire VI <i>Session Chair:</i> <i>A. Mensch</i> <i>P. Sunderland</i>	Alternative Fuels & Emissions VI <i>Session Chair:</i> <i>A. Strzelec</i>	Laminar Flames VI <i>Session Chair:</i> <i>T. Goyal</i> <i>Z. Zhou</i>	Droplets & Sprays I <i>Session Chair:</i> <i>D. Jarrahbashi</i>	Theory & Modeling I <i>Session Chair:</i> <i>V. Acharya</i> <i>F. Guzman</i>	IC Engines III <i>Session Chair:</i> <i>S.R. Narayanan</i> <i>A. Saha</i>	Novel I <i>Session Chair:</i> <i>T.S. Tanuja</i>
11:20 – 11:40	2A05: Experimental and modeling study of the autoignition behavior of a saturated heterocycle: pyroolidine <i>S.S. Goldsborough, M. Jespersen, J. Saniner, R. Sivaramakrishnan, Q. Do, B. Lefort, Z. Serinyel, G. Dayma, L.P. Maffei, M. Mehl, M. Pelucchi, W.-J. Pitz</i>	2B05: Evaluation of angular resolution requirements in the solution of the radiative transfer equation <i>Y.J. Kim, A. Trouné</i>	2C05: Liftoff heights and blowoff limits of coflow nonpremixed ammonia/methane flames <i>Z. Xiang, D. Curtis, C.S. McEnally, L.D. Pfefferte, V.C. Whoriskey</i>	2D05: A simple method for the quantitative assessment of soot production rate <i>K. Gleason, A. Gomez</i>	2E05: Vapor-Liquid Equilibrium (VLE)-based CFD simulation and investigation of transport models <i>W. Helwig, X. Shi, W.A. Sirignano</i>	2F05: Three-dimensional rotational flamelet with detailed chemistry and transport models <i>W. Helwig, X. Shi, W.A. Sirignano</i>	2G05: Evaluation of a rotary engine adapted for power generation as operated on hydrogen/natural gas mixtures <i>W. Villatoro, M. Venaa, V. McDonell</i>	2H05: Analysis of spray atomization effects on the performance of porous media as disruptors of thermoacoustic instability <i>M. Johnson, A. James, A.K. Agrawal</i>
11:20 – 11:40	2A06: Theoretical kinetics predictions on the reactions on the NH ₂ O potential energy surface <i>S. J. Klippenstein, C. Mulvihill, P. Glarborg</i>	2B06: Modeling of firebrand transport and ignition in regional-scale fire spread simulations <i>Y. Qin, A. Trouné</i>	2C06: Computational fluid dynamics modeling of flame behavior for sustainable aviation fuels in gas turbine combustors <i>D. Dasgupta, C. Bhattacharyya, S. Som</i>	2D06: Competition and synergy between reaction progress and unequal-diffusion effects on stretch flame propagation under elevated thermodynamics conditions <i>K. Akita, H. Ge, P. Zhao</i>	2E06: VLE-based CFD simulation of a high-pressure turbulent reacting mixing layer <i>N. Srinivasan, H. Zhang, S. Yang</i>	2F06: A framework for combustion chemistry acceleration with DeepONets <i>A. Kumar, T. Echehki</i>	2G06: Study of NO _x formation at lean conditions in a prechamber-ignited two-stroke natural gas engine <i>J. Nowlin, M. Patterson, T.J. Jacobs</i>	2H06: Low-temperature ammonia oxidation kinetics in a nanosecond repetitively pulsed discharge <i>H. Zhong, X. Mao, N. Liu, Z. Wang, Y. Ju</i>

We would like to thank our sponsors:

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J. Mike Walker '66 Department of Mechanical Engineering

TEES Turbomachinery Laboratory

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
11:40 – 12:00	Reaction Kinetics VI <i>Session Chair:</i> <i>P. Westmoreland</i>	Fire VI <i>Session Chair:</i> <i>A. Mensch</i> <i>P. Sunderland</i>	Alternative Fuels & Emissions VI <i>Session Chair:</i> <i>A. Strzelec</i>	Laminar Flames VI <i>Session Chair:</i> <i>T. Goyel</i> <i>Z. Zhou</i>	Droplets & Sprays I <i>Session Chair:</i> <i>D. Jarrahbashi</i>	Theory & Modeling I <i>Session Chair:</i> <i>V. Acharya</i> <i>F. Guzman</i>	IC Engines III <i>Session Chair:</i> <i>S.R. Narayanan</i> <i>A. Saha</i>	Novel I <i>Session Chair:</i> <i>T.S. Taneja</i>
12:00 – 12:20	2A07: Analyzing the homogeneity of propane/air ignition in shock tubes: High-speed imaging and ignition delay time measurements <i>D. Naveel,</i> <i>S.P. Cooper,</i> <i>M.G. Sandberg,</i> <i>M. Abulail,</i> <i>D.J Mohr, M.K. Hay,</i> <i>M. Fikri,</i> <i>W.D. Kulatilaka,</i> <i>E.L. Petersen,</i> <i>C. Schulz</i>	2B07: Simulation of fire spread over discrete and loosely packed cardboard fuel beds <i>M.M. Ahmed,</i> <i>A. Trouvé,</i> <i>J.M. Forthofer,</i> <i>M.A. Finney</i>	2C07: Simulations of fuel-air mixing in a 7 element Lean Direct Injection (LDI) aviation combustor <i>S.N. Appukkuttan, B. Perry,</i> <i>S. Yellapanula,</i> <i>L. Esclapez,</i> <i>H. Sitaraman,</i> <i>M. Day</i>	2D07: Optical characterization of cellular instabilities in spherically expanding ammonia-hydrogen flames <i>B. Nawaz,</i> <i>M.N. Nasim,</i> <i>S.K. Das,</i> <i>D. Assanis,</i> <i>J.P. Treilles,</i> <i>N. Van Dam,</i> <i>J.H. Mack</i>	2E07: Quantitative measurements of soot volume fraction from digital images of burning hydrocarbon fuel droplets <i>Y. Xu, Y. Shen,</i> <i>C.T. Avedisian,</i> <i>M.C. Hicks,</i> <i>M.Y. Choi</i>	2F07: Convective disturbance effects on entropy generation dynamics <i>M. Wise, T. John,</i> <i>V. Acharya</i>	2G07: Cycle-by-cycle modeling of integral compressor engines for real-time emissions control <i>K. Wallace,</i> <i>T. Jacobs</i>	2H07: A numerical investigation of peripheral injection in a constant volume combustion chamber <i>E.F. Bogdanowicz,</i> <i>A. Loper,</i> <i>Z. Harris, J. Bittle,</i> <i>A.K. Agrawal</i>
12:00 – 12:20	2A08: Experimental and modeling study of the high-temperature thermal decomposition of acetone/trile <i>R.A. Schwind,</i> <i>C.A. Almodovar, C.F. Goldsmith</i>	2B08: Pyrolyzates of live vegetative fuel <i>M. Andersen,</i> <i>D. Blunck,</i> <i>C. Hagen</i>	2C08: Preliminary emissions and stability data from a turbulent ammonia-hydrogen swirl burner <i>C.F.W. Goertemiller,</i> <i>D.E. Thomas,</i> <i>S. Kane,</i> <i>W.F. Northrop</i>	2D08: Analysis of uncertainties in the measurement of Markstein number and laminar flame speed of H ₂ /O ₂ /He mixtures at unity Lewis number in spherically expanding laminar flames <i>R. Ramesh,</i> <i>A. Vinod,</i> <i>F. Bisetti,</i> <i>M. Gamba</i>	2E08: Repetitive autoignition and extinction of near-limit non-premixed n-dodecane spray cool flames <i>W. Xu, Z. Wang,</i> <i>B. Mei, J. Hong,</i> <i>Y. Ju</i>	2F08: Generalized preconditioning for accelerating the integration of reactors with coupled gas-surface chemistry <i>A.S. Walker,</i> <i>R.L. Speth,</i> <i>K.E. Niemeyer</i>	2G08: Simulations of dual-fuel natural gas/diesel operation in large-bore locomotive engines <i>S.J. Kazmouz,</i> <i>A. Klingbeil,</i> <i>T. Lavertu,</i> <i>V. Jayakar,</i> <i>P. Sheeth,</i> <i>S. Wijeyakulasurya,</i> <i>M. Ameen</i>	

Lunch Break (Lunch on your own) 12:20 - 14:10
USSCI Board Meeting

Century Ballroom
Women in Combustion Luncheon

2023 USNCM Undergraduate Research Competition Presentations (Century Ballroom) 14:10 – 15:00

Awards Committee Chair: Omid Samimi-Abianeh

Awardees:

Dominic Curtis, Yale University
Jacob Klein, Wayne State University
James Ringsby, Cornell University

Transfer 15:00 – 15:05								
Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
15:05 – 15:25	Reaction Kinetics VII <i>Session Chair:</i> <i>J. Kim</i> <i>R. West</i>	Fire VII <i>Session Chair:</i> <i>B. Shotorban</i>	Alternative Fuels & Emissions VII <i>Session Chair:</i>		Droplets & Sprays II <i>Session Chair:</i> <i>T. Fang</i> <i>S. Singer</i>	Theory & Modeling II <i>Session Chair:</i> <i>V. Akkerman</i> <i>S. Whitman</i>	IC Engines IV <i>Session Chair:</i> <i>P.R. Jha</i>	Novel II <i>Session Chair:</i> <i>S. Deng</i> <i>J. Zhang</i>
	2A09: Competing radical and molecular channels in the unimolecular dissociation of methylformate <i>R. Sivaramakrishnan,</i> <i>N.-J. Labbe,</i> <i>L.B. Harding,</i> <i>S.J. Klippenstein</i>	2B09: Extinction of the stagnation point diffusion flame: Effect of conductive heat loss into solid interior <i>C. Li,</i> <i>J. T'ien,</i> <i>M. Johnston</i>	2C09: Compression ignition engine performance of butyl- and propyl-terminated oxymethylene ethers <i>A. Zdanowicz,</i> <i>S. Lucas,</i> <i>B. Windom</i>		2E09: Characterization of a hot-surface ignition experiment for liquid fuels and propellants <i>D.S. Teige,</i> <i>J.C. Thomas,</i> <i>T.E. Sammet,</i> <i>E.L. Petersen</i>	2F09: A hybrid unsupervised cluster-wise regression approach for representing the flamelet tables <i>R. Mishra,</i> <i>S. Mayivahanan,</i> <i>D. Jarrahbashi</i>	2G09: Pre-combustion chamber nozzle design effect on unburned methane emissions of a large bore two-stroke lean-burn natural gas engine <i>G. Vieira,</i> <i>K. Beurlot, N. Xie,</i> <i>M. Patterson,</i> <i>D. Olsen</i>	2H09: OpenFOAM solver for volume-averaged modeling of porous media burners <i>A. Saha, S. Sobhani</i>
15:25 – 15:45	2A10: Nonthermal effects in the dissociation of HOCO and other carbonyl-centered free radicals <i>J. Cho, A.W. Jasper,</i> <i>S.J. Klippenstein,</i> <i>R. Sivaramakrishnan</i>	2B10: Modeling firebrand deposition between two blocks representing adjacent structures in wildland-urban interface fires <i>A. Mankame,</i> <i>P. Damiani,</i> <i>B. Shotorban</i>	2C10: Characterization of crankcase ventilation gas on stationary natural gas engines <i>A.Q. Castillo,</i> <i>A. Zdanowicz,</i> <i>B. Windom,</i> <i>D. Olsen</i>		2E10: Experimental characterization of transcritical spray with varying fuel temperature and injection pressure <i>K.N. Vinod,</i> <i>R. Kempin, T. Fang</i>	2F10: Computational fluid dynamics modeling of jet-stirred reactors <i>J.F. DeJongh,</i> <i>B. Rotavera</i>	2G10: Experimental investigation of unburned hydrocarbon production in dual-fuel heavy-duty RCCI engine running high COV operating point at low load <i>G. Silvagni,</i> <i>A. Narayanan,</i> <i>K.K. Srinivasan,</i> <i>S.R. Krishnan,</i> <i>V. Ravaglioli</i>	2H10: Dynamics of inter-pulse coupling in nanosecond pulsed plasma assisted ignition <i>T.S. Taneja,</i> <i>T. Ombrello,</i> <i>J. Lefkowitz,</i> <i>S. Yang</i>

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
15:45 – 16:05	Reaction Kinetics VII Session Chair: <i>J. Kim</i> <i>R. West</i>	Fire VII Session Chair: <i>B. Shotorban</i>	Alternative Fuels & Emissions VII Session Chair:		Droplets & Sprays II Session Chair: <i>T. Fang</i> <i>S. Singer</i>	Theory & Modeling II Session Chair: <i>V. Akkerman</i> <i>S. Whitman</i>	IC Engines IV Session Chair: <i>P.R. Jha</i>	Novel II Session Chair: <i>S. Deng</i> <i>J. Zhang</i>
	2A11: Plasma-assisted reforming of hydrocarbon gas flare mixtures for emission control <i>P.N. Johnson,</i> <i>T.S. Taneja,</i> <i>S. Yang</i>	2B11: Transient gas and particulate emissions from Douglas-fir and lodgepole pine at two different moisture contents <i>P. Garg,</i> <i>S. Wang,</i> <i>M.J. Gollner</i>	2C11: Hydrogen-natural gas fuel blending in a Caterpillar CG137-8 “rich burn” engine with 3-way catalyst <i>N. Katsampes,</i> <i>D. Montgomery,</i> <i>G. Arney,</i> <i>D.B. Olsen</i>		2E11: Water film behavior on the surface of an airfoil in a high-speed flow <i>Sqftullah,</i> <i>B. Esquivias,</i> <i>B. Hickey,</i> <i>V. McDonnell</i>	2F11: Reduced-order modeling of reacting flows with a regression-aware autoencoder <i>K. Zdybal,</i> <i>A. Parente,</i> <i>J.C. Sutherland</i>	2G11: Reduced ethanol skeleton mechanism for multi-dimensional engine simulation <i>S. Roy, R. Mishra,</i> <i>O. Askari,</i> <i>D. Jarrahbashi</i>	2H11: Quantitative femtosecond two-photon absorption laser induced fluorescence measurements of atomic hydrogen and nitrogen in low temperature plasmas <i>N. Liu, X. Mao,</i> <i>C. Kondratowicz,</i> <i>Z. Shi, T.Y. Chen,</i> <i>H. Zhong, Y. Ju</i>
16:05 – 16:25	2A12: Unimolecular reactions and R + O ₂ Reactions of 2,4-dimethyloxetanyl radicals <i>A.C. Doner,</i> <i>J. Zador,</i> <i>B. Rotavera</i>	2B12: Quantification of firebrand generation from typical WUI fuels for model development <i>X. Ju,</i> <i>M. Conkling,</i> <i>M. Hajilou, B. Hu,</i> <i>M.J. Gollner</i>	2C12: Reduction of methane emissions with hydrogen substitution on a lean burn four stroke natural gas engine <i>J. Bayer, B. Windom,</i> <i>D. Montgomery,</i> <i>0181D. Olsen, A. Zdanowicz</i>		2E12: Comparison of droplets combustion characteristics for single component and multicomponent diesel surrogates with commercial petroleum-based diesel fuel <i>A.S.M. Sazzad</i> <i>Parveg, A. Ratner</i>	2F12: A parallel in situ adaptive tabulation using MPI shared memory for combustion simulation <i>H. Zhang, S. Yang</i>	2G12: Numerical investigation of differential evaporation of multi-component gasoline surrogate fuels <i>J.-W. Park,</i> <i>R. Mandhapati,</i> <i>A. Zhang, L. Zhao,</i> <i>Y. Pei, A. Mittal,</i> <i>T. Malewicki,</i> <i>M. Hajiw</i>	2H12: Ignition enhancement by non-equilibrium plasma discharge in a NH ₃ /air mixture <i>X. Mao, H. Zhong,</i> <i>N. Liu, Z. Wang,</i> <i>Y. Ju</i>
Break 16:25 – 16:55 Make sure to visit the Work in Progress Posters outside the Century Ballroom And please visit our exhibitors outside the Century Ballroom: Southwest Research Institute (SWRI) Telops								

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
16:55 – 17:15	Reaction Kinetics VIII <i>Session Chair:</i> <i>R. Choudhary</i> <i>S.R. Narayanan</i>	Fire VIII <i>Session Chair:</i> <i>L. Gagnon</i> <i>A. Trouvé</i>	Alternative Fuels & Emissions VIII <i>Session Chair:</i> <i>J. Mack</i> <i>P. Papas</i>		Droplets & Sprays III <i>Session Chair:</i> <i>F. Saffullah</i>	Theory & Modeling III <i>Session Chair:</i> <i>H.A. Maldonado</i> <i>Colman</i>	Industrial and Applied I <i>Session Chair:</i> <i>T. Robertson</i> <i>C. Xu</i>	Novel III <i>Session Chair:</i> <i>X. Mao</i> <i>W. Sun</i>
	2A13: The kinetics and warm flame chemistry associated with radiative extinction of spherical diffusion flames <i>K.A. Waddell,</i> <i>G. Yablonsky,</i> <i>D. Constales,</i> <i>P.B. Sunderland,</i> <i>R.L. Axelbaum</i>	2B13: Effects of oxygen availability and ventilation flow rate on fuel crib burning <i>S. McAllister,</i> <i>E. Belmont</i>	2C13: Combustion, performance, and emissions comparison of a liquefied petroleum gas heavy-duty engine with direct and port-fuel injection <i>T. Fosudo, T. Kar,</i> <i>R. Duffens,</i> <i>B. Windom,</i> <i>D. Olsen</i>		2E13: Experimental observation of sphere symmetric isolated single droplet combustion in a converging channel <i>M. Williams,</i> <i>C. Dixon,</i> <i>N. DeMaio, S.J. Lim,</i> <i>F.L. Dwyer,</i> <i>S.H. Won</i>	2F13: Local and global sensitivity analysis of gypsum board calcination <i>R.C. Payne,</i> <i>R.P. Hancock,</i> <i>S. Khan,</i> <i>S. Kozhumal,</i> <i>H. Sezer</i>	2G13: Retrofitting a forced draft water heater for low emission operation on 100% hydrogen <i>B. Hickey,</i> <i>S. Srivastava,</i> <i>V. Smirnov,</i> <i>G. Zijlstra,</i> <i>V. McDonell</i>	2H13: Transient plasma-enhanced combustion of carbon-free fuels for reduced greenhouse gas emissions <i>B. Zhang, M. Rubio,</i> <i>O. Hernandez,</i> <i>Y. Chen,</i> <i>F. Egofoopoulos,</i> <i>S.B. Cronin</i>
17:15 – 17:35	2A14: Optimization of NO _x chemistry against the natural gas oxidation experiment in the plug flow reactor <i>M.K. Yoon,</i> <i>A.V. Kock,</i> <i>F.L. Dwyer,</i> <i>S.H. Won</i>	2B14: Examining the effectiveness of water suppression for mitigating backdrafts <i>R. Falkenstein-Smith,</i> <i>T. Cleary</i>	2C14: Spectroscopic investigation of premixed H ₂ /NH ₃ /N ₂ -air flames stabilized on a H ₂ -air pilot flame <i>K. Naude,</i> <i>M. Suarez,</i> <i>P. Parajuli,</i> <i>W. Kulatilak</i>		2E14: Autoignition of n-decane droplets at various oxygen concentrations: Experimental observations under normal and microgravity <i>M.J. Johnson,</i> <i>T.S. Krause, Y. Xu,</i> <i>V. Nayagam,</i> <i>D.L. Dietrich</i>	2F14: Diffusion flame extinction: Exploring a unified criterion from quenching to blowoff <i>C. Li, J. T'ien</i>	2G14: Development of the modular Staged Pressurized Oxidation (SPOC) power plant for coal and biomass <i>D. Magalhaes,</i> <i>Z. Yang, P. Verma,</i> <i>M. Cheng, A. Sankaranarayanan,</i> <i>Z. Wargel,</i> <i>R.L. Axelbaum</i>	2H14: Testing of aqueous wastewater solutions using supercritical water oxidation <i>C.A. Riggins,</i> <i>M.C. Hicks,</i> <i>U.G. Hegde,</i> <i>D.J. Gotti,</i> <i>J. Kojima,</i> <i>R.E. Padilla, Y. Xu</i>
17:35 – 17:55	2A15: A high pressure jet-stirred reactor study of di-iso-pentyl ether and detailed kinetic modelling <i>G. Cenedese,</i> <i>Z. Serinyel,</i> <i>M. Laillan,</i> <i>G. Dayma,</i> <i>P. Dagaut</i>	2B15: Theoretical estimate of radiative quenching for solid fuel diffusion flames in microgravity <i>K. Budzinski,</i> <i>P.E. Desjardin</i>	2C15: An assessment of kinetic models for ammonia flame extinction <i>P. Papas,</i> <i>R. Fang,</i> <i>C.-J. Sung,</i> <i>L.L. Smith,</i> <i>J.F. Stevens</i>		2E15: Cool, warm, and hot flames of farnesane droplets burning in microgravity <i>T.S. Krause,</i> <i>V. Nayagam,</i> <i>D.L. Dietrich,</i> <i>T.I. Farouk,</i> <i>F.L. Dwyer,</i> <i>F.A. Williams</i>	2F15: A posteriori evaluation of principal component transport in homogeneous charge compression ignition conditions <i>K.S. Jung, A. Kumar,</i> <i>T. Echekki, J.H. Chen</i>	2G15: A novel dew point meter: Application to the measurement of the sulfuric acid dew point for combustion flue gas <i>M. Cheng, Z. Wargel,</i> <i>R.L. Axelbaum</i>	2H15: Plasma-coupled flow reactor studies of low-temperature plasma assisted kinetics of methanol blended with CO ₂ <i>K. Bopaiath,</i> <i>T. Middleton,</i> <i>N. Tsolas</i>

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2	Ross 1	Ross 2
17:55 – 18:15	Reaction Kinetics VIII <i>Session Chair:</i> <i>R. Choudhary</i> <i>S.R. Narayanan</i>	Fire VIII <i>Session Chair:</i> <i>L. Gagnon</i> <i>A. Trouvé</i>	Alternative Fuels & Emissions VIII <i>Session Chair:</i> <i>J. Mack</i> <i>P. Pappas</i>		Droplets & Sprays III <i>Session Chair:</i> <i>F. Safjullah</i>	Theory & Modeling III <i>Session Chair:</i> <i>H.A. Maldonado</i> <i>Colman</i>	Industrial and Applied I <i>Session Chair:</i> <i>T. Roberison</i> <i>C. Xu</i>	Novel III <i>Session Chair:</i> <i>X. Mao</i> <i>W. Sun</i>
	2A16: Addressing key rate constant uncertainties in NH ₃ kinetics models using multiscale in foratics <i>R.E. Cornell,</i> <i>C.E. LaGrotta,</i> <i>M.P. Burke</i>	2B16: Measurement of total heat generation and energy carried by ejected materials during thermal runaway process of 18650 lithium-ion batteries <i>P. Garg,</i> <i>L. Gagnon,</i> <i>D. Zeng,</i> <i>Y. Wang</i>	2C16: Development of natural gas/hydrogen fuel flexible reduced chemical mechanism for modeling of a low emission gas turbines <i>M.A. Valles Castro,</i> <i>I. Kessler,</i> <i>B.C. Windom</i>		2E16: Modeling temperature evolution in high-temperature surface caused by drop - wall interaction <i>S. Ahamed,</i> <i>S.-C. Kong</i>	2F16: Improvement of data-based reduced-order combustion models <i>E. Armstrong,</i> <i>J.C. Sutherland</i>	2G16: Reactor network modeling of a residential wood stove <i>E. Ackerman,</i> <i>B. Pawlowski,</i> <i>J. Mollendorf,</i> <i>P. DesJardin</i>	2H16: Numerical study on biomass co-firing in pressurized oxy-combustion <i>J. Zhang, L. Li,</i> <i>D. Magalhães,</i> <i>R.L. Axelbaum,</i> <i>X. Wang,</i> <i>V. Akkerman</i>
Banquet at the Ford Hall of Champions 18:45 – Doors Open 19:30 – Banquet Begins								
End of Day								

Wednesday, 22 March 2023

Announcements (Century Ballroom)

Eric Petersen, Local Host, 13th U.S. National Combustion Meeting

Wednesday U.S. Early Career Combustion Investigator Plenary 8:00 - 9:10 (Century Ballroom)

Bridging Combustion Fundamentals to Applied Problems

Derek Splitter, Oak Ridge National Laboratories

Session Chair: Paul Papas

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2
	Reaction Kinetics IX Session Chair: <i>X. Dong</i> <i>C. Mulvihill</i>	Fire IX Session Chair: <i>E. Belmont</i> <i>S. Hossain</i>	Ammonia Reaction Kinetics Session Chair: <i>Y. Almarzooq</i> <i>D. Thomas</i>	Droplets and Sprays IV Session Chair: <i>J. Palmore</i> <i>Y. Xu</i>	Industrial and Applied II Session Chair: <i>Q. Meng</i>	Novel IV Session Chair:
09:15 – 09:35	3A01: Automated kinetic models to predict the flame speeds of halocarbons <i>N. Khalil, S. Harris, R.H. West</i>	3B01: Modeling of firebrand dispersion and deposition in turbulent jet flows <i>P. Damiani, A. Mankame, B. Shotorban</i>	3C01: Experimental and detailed kinetics modelling study of NH ₂ chemiluminescence during ammonia combustion <i>A. Karan, M. Khan-Ghauri, C.M. Grégoire, O. Mathieu, E.L. Petersen, G. Dayma, C. Chauveau, F. Halter</i>	3D01: Statistics of the interactions between an underexpanded shock train and a liquid spray <i>C.B. Reuter, S.G. Tuttle</i>	3E01: Numerical investigation of dual-mode ignition in a novel hydrogen reactor <i>S.H.R. Whitman, B. Wu, Z. Wang, C. Xu</i>	3F01: Swiss-roll heat recirculating ammonia reformer for gas turbine applications <i>P. Radjowski, P. Bhuripanyo, C.-H. Chen, P. Romney</i>
09:35 – 09:55	3A02: DRGEP autoencoders: Physics-based data-driven low-dimensional manifolds for capturing complex chemistry <i>N. Kincaid, A. Newale, P. Pepiot</i>	3B02: Severity of pollutant emissions from wildfires and prescribed fires <i>K. Töppervien, A.Y.W. Lee, G. Vignat, E. Boigné, A. Feinberg, M. Prunicki, K. Nadeau, M. Kling, M. Ihme</i>	3C02: Investigation on the oxidation kinetics of ammonia/hydrogen mixtures up to 100 atm <i>B. Mei, Z. Wang, N. Liu, Y. Ju</i>	3D02: Modeling droplet vaporization with multicomponent diffusion and combustion properties with accuracy, efficiency, and flexibility <i>S. Singer</i>	3E02: Gas generation during thermal runaway of 18650 lithium-ion batteries with lithium iron phosphate cathode chemistry <i>C.A. Almodovar, L.R. Boeck, C.R.L. Bauwens</i>	3F02: An investigation of blue whirl sealing <i>E.T. Balci, E.S. Oran</i>
09:55 – 10:15	3A03: The low-temperature HyChem-1: Rationale and model development <i>R. Choudhary, P. Biswas, V. Boddapati, S. Clees, J. Shao, D.F. Davidson, H. Wang, R.K. Hanson</i>	3B03: Influence of adjacent fuels on ignition and burning during wildfires <i>P. Tiwari, N. Gardner, D. Sharma, D. Blunck</i>	3C03: Global pathway analysis to understand the plasma-assisted combustion of ammonia <i>P.N. Johnson, T.S. Taneja, S. Yang</i>	3D03: High-speed visualization of precursor droplet evaporation in flame assisted spray pyrolysis of NCM811 battery cathodes <i>M. Bhat, J. Zhang, C. Zhang, S. Deng</i>		3F03: Molecular beam mass spectrometry studies of non-thermal plasma-assisted ammonia decomposition and oxidation <i>J. Choe, D.E. Couch, N. Hansen, W. Sun</i>

Room #	Hullabaloo	Traditions	Reveille 1	Reveille 2	Corp 1	Corp 2
10:15 – 10:35	Reaction Kinetics IX <i>Session Chair:</i> <i>X. Dong</i> <i>C. Muthuwill</i>	Fire IX <i>Session Chair:</i> <i>E. Belmont</i> <i>S. Hossain</i>		Droplets and Sprays IV <i>Session Chair:</i> <i>J. Palmore</i> <i>Y. Xu</i>		Novel IV <i>Session Chair:</i>
10:35 – 10:55	3A04: The low-temperature HyChem-II: Application to real fuels <i>R. Choudhary, P. Biswas, V. Boddapati, S. Clees, D.F. Davidson, H. Wang, R.K. Hanson</i>			3D04: Ignition enhancement of liquid ammonia sprays under engine-relevant conditions via ambient hydrogen addition <i>A.H. Bakir, H. Ge, Z. Zhang, P. Zhao</i>		3F04: Effects of flame on the morphology and electrochemical performance of nickel-rich cathode materials synthesized by flame assisted spray pyrolysis <i>J. Zhang, C. Zhang, M. Bhat, S. Deng</i>
				3D05: Investigations in multiphase detonation phenomena <i>C.J. Young, V.O. Duke-Walker, J.A. McFarland</i>		3F05: Direct numerical simulation of a realistic supercritical carbon dioxide oxy-combustor <i>R. Mishra, D. Jarrabhashi</i>

Texas A&M Combustion Laboratories Tour

11:00 to 12:00 and 13:30 to 15:00

End of Day

13th U.S. National Combustion Meeting Work in Progress Posters

- PP#01 Effect of hydrogen and NOx addition on the ignition of iso-octane at ultra-lean and lean conditions
K. Hakimov (P), W. Tang, A. Nicolle, S. Sarathy, A. Farooq
- PP#02 Modeling pyrolysis of moving biomass particle considering shrinkage using overset lattice Boltzmann method
Y. Cho (P), S.-C. Kong
- PP#03 Effect of difluoromethane on ignition delay times of propane
E. Guzman (P), F. Goldsmith, R. Schwind
- PP#04 Theoretical conditions for burning in solid propellant slots
T. Hafner (P), S. Son, M. Ornek, D. Messer
- PP#05 Development of fs/ps CARS for quantifying pressure in a reacting gas mixture
M.A. Akkari (P), C. Dedic
- PP#06 Low cost in cylinder pressure sensors for high efficiency natural gas heavy-duty on-road engines
J. Rodriguez (P), D. Olsen, B. Windom, H. Xu, G. Hampson
- PP#07 Measuring critical fuel properties for high fidelity aviation turbine simulations
G.M. Fioroni (P), S. Yellapantula, R.L. McCormick
- PP#08 Engine-emissions-aftertreatment integrated simulation tool for enabling near zero emissions
A. Strzelec (P), S. Wahiduzzaman, S. Gundlapally, E. Koehler, B. Vernham
- PP#09 The characterization of hydrogen flames at high temperatures and pressures using a rapid compression machine
I. Kessler (P), M. Valles, B. Windom
- PP#10 A miniaturized ignition screening rapid compression machine for probing auto-ignition characteristics
M. Tomar (P), A. Dalmiya, P. Zhao, P. Lynch
- PP#11 Early plume development and NOx chemistry in LOx/H2 and LOx/CH4 liquid rocket engines
C. Hagsröm (P), R. Speth
- PP#12 Radiation heat transfer modelling of a solid fuel slab burner for high performance computing
O. Mylotte (P), P. Desjardin
- PP#13 Post processing dual-comb spectroscopy data for interference free multi-species measurements in shock tubes
M. Geiser (P), R. Horvath, F. Arqfin, S. Vasu, R.K. Rahman
- PP#14 Surface temperature and emissivity measurement for materials exposed to a flame through two-color IR-thermography
B. Saute (P), T. Pelzmann, J.-P. Gagnon, F. Dupont
- PP#15 Development of fs/ps CARS for quantifying pressure in a reacting gas mixture
M.A. Akkari (P), C. Dedic
- PP#16 High-temperature line strengths with He- and Ar-broadening coefficients of the P(20) line in the 1 ← 0 band of carbon monoxide
C. Gregoire (P), O. Mathieu, E. Petersen
- PP#17 Emission spectra from NH3/H2-Air and NH3/H2/N2-air spherical laminar flames
Y. Almarzooq (P), M. Hay, M. Turner, W. Kulatilaka, E. Petersen
- PP#18 Laser absorption tomography of nitrous oxide destruction in reacting flows
B. Steavenson (P), L. Munera, T. Crumley, D. Pineda
- PP#19 Developing in-situ, gas-phase spectroscopy methods to explore combustion intermediate and product species
A. Stevenson (P), C. Dedic
- PP#20 High-speed imaging of the inhomogeneous ignition phenomena of propane
D. Mohr (P), E. Petersen, S. Cooper, M. Abulail, M. Sandberg, M. Hay, W. Kulatilaka, D. Nativel
- PP#21 Chemiluminescence imaging studies of piloted ammonia flames
W. Kulatilaka, M. Suarez (P), K. Naude, P. Parajuli, M. Hay
- PP#22 Hydroxyl (OH) planar-laser-induced fluorescence imaging of flame structure in piloted ammonia flames
W. Kulatilaka, M. Hay (P), A.P. Hardaya
- PP#23 Withdrawn

- PP#24 High-pressure flame thermometry using femtosecond TPLIF of seeded krypton
W. Kulatilaka, M. Hay, P. Parajuli (P)
- PP#25 Investigation of niacin dust cloud ignition and combustion using OH-PLIF
W. Kulatilaka, C. Schweizer (P), C. Mashuga
- PP#26 Droplet evaporation and combustion research at CAMPhyRE Group
J. Palmore (P), M. Setiya
- PP#27 Laser-induced combustion and shock wave expansion dynamics of nano-aluminum
B. Singh (P), S. Biswas
- PP#28 Laser-ignited solid-fuel characteristics
F. Rodriguez (P), E. Petersen
- PP#29 Detailed kinetics applied to the numerical study of wildland fuels combustion and emissions
C. Saggese (P), W. Sun
- PP#30 Flammability and performance of a wood composite material and a water/gelatin-based flame retardant
J. Avalos (P), M. Difieri, J. Cobian-Iñiguez, J. Esmay, L. Davila, S. Lee, J. Hardy
- PP#31 Investigating the role of oxygen availability in glowing firebrand accumulations under natural convection
L. Zhu (P), J. Urban
- PP#32 Experimental study on the ignition behavior of wildland fuels ignited by heated metal particles
S. Saha (P), J. Cobian-Iñiguez
- PP#33 Development of a computer vision method for rate of fire spread estimation in wildland fuels
E. Ameri (P), K. Aawayan, C. Duran, P. Mendoza Rueda, D. Sepulveda, J. Cobian-Iñiguez
- PP#34 Light scattering study of soot produced by burning contaminated liquid fuels with heavy metal ions
R. Ebini (P), J.A. Hubbard, C. Sorensen, D. Wiemann, T. Settecerri
- PP#35 Flexi Alcohol Mix (FAM) fuel as potential fuel for reactivity-controlled compression ignition engine
V. Sharma (P), J.J. Thomas
- PP#36 Prechamber-equipped optical constant volume combustion chamber
D. Sen (P), S. Biswas
- PP#37 Reducing emissions of methane through advanced radical kinetics and adaptive burning in large-bore engines
F. Pommier (P), T. Jacobs
- PP#38 ACME: Advanced Combustion via Microgravity Experiments
D. Stocker (P)
- PP#39 Measuring temperature and extinction of diluted NH₃-H₂ counterflow diffusion flames
D. Thomas, J. Jarosz (P), W. Schutte, P. Walls
- PP#40 Spherically expanding hydrofluorocarbon/air flames in microgravity
J. Mathew (P), J. Tavares, J. Jayachandran
- PP#41 Non-spherical NH₃-air flames and laminar burning velocity measurements
N. Van Dam (P), C. Bossi, B. Nawaz, M.N. Nasim, A. Shaalan, D. Assanis, J. Mack
- PP#42 Measurements of laminar flame thickness and application to hydrodynamic instability
M. Turner (P), M. Hay, W. Kulatilaka, E. Petersen
- PP#43 Experimental and modeling studies of hydrogen/oxygen/air diffusion flame under the influence of an applied DC electric field
S. Pathmasiri (P), V. Akkerman, F. Goulay, H. Perera, M. Tinsley, L. Lei
- PP#44 Effect of fuel reactivity on flare efficiency and combustion dynamics
O. Alagbe, S. Biswas, R. Das (P)
- PP#45 Carbon capture technology based on oxygen-enriched flameless combustion, a techno-economic analysis.
R. Maldonado (P)
- PP#46 Withdrawn
- PP#47 Characterizing strong ignition overpressure in oxy-methane combustion experiments
M. Sandberg (P), M. Turner, E. Petersen

- PP#48 Progress on development of a portable, miniature slab burner
J. Karapetian (P), J. Kalman, B. Pizarro-Romero
- PP#49 Experimental evaluation of battery safety hazards
C. Landry (P), P. Adefranje, S. McCaulley, J. Thomas
- PP#50 Ethanol+N₂O as potential rocket propellants: An experimental and kinetic modeling study.
M. Preußker (P), J. Schmacka, K.A. Heufer
- PP#51 Kinetic study of unsaturated cyclic ketone reactions with the OH radical
P. Rutto (P), H. Moran, T. Selby, F. Goulay
- PP#52 Uncertainty quantification and constraint of chemical kinetic mechanisms of methanol, n-decane and n-heptane oxidation based on flow reactor experiments utilizing sensitivity analysis
A.V. Kock (P), S.H. Won, M.K. Yoon, F.L. Dwyer
- PP#53 Effect of temperature on turbine lubricating oil pyrolysis
R. Juarez (P), N. Gutierrez, E.L. Petersen
- PP#54 Shock-tube CO measurements during the combustion of ethylene carbonate, a battery electrolyte component
C. Gregoire (P), E. Petersen, O. Mathieu, H. Nakamura, K. Kanayama, K. Maruta
- PP#55 Ignition of HTPB using an endwall injector system on a shock tube
M. Abulail (P), M. Sandberg, S. Cooper, E. Petersen
- PP#56 A machine-learning-powered workflow for predicting transition state structures
X. Dong (P), L. Pattanaik, S.-C. Li, K. Spiekermann, A. Menon, H. Wu, H.-W. Pang, W. Green
- PP#57 Simulating Supercritical Pressure Jet Stirred Reactor (SP-JSR) conditions for propane oxidation with real-gas effects through reactive molecular dynamics (ReaxFF)
C. Burger (P), A.D. Lele, Y. Ju
- PP#58 Experimental kinetics study on diethyl carbonate oxidation
O. Mathieu (P), E. Petersen, C. Gregoire, S. Cooper
- PP#59 Using HiPS as a mixing model for transported PDF calculations of turbulent non-premixed flames
M. Behrang (P), D. Lignell
- PP#60 Deep learning modeling of the filtered generalized progress variable dissipation rate in turbulent premixed combustion
A. Robang (P), C. Lacey, G. D'Alessio, M. Mueller
- PP#61 Recent developments for a turbulent flame speed experiment
N. Lindblade (P), E. Petersen, M. Turner, B. Dolle
- PP#62 Characterization of the turbulent flow field in a turbulent flame vessel
B. Dolle (P), E. Petersen
- PP#63 Learning reduced order surrogate models with Chemtab
D. Deighan (P), A. Salunkhe, P. Desjardin, V. Chandola
- PP#64 Effect of mixing characteristics on efficiency of pulse plasma-assisted fuel reforming
S. Huang (P), S. Weng, S.B. Cronin, P.D. Ronney

13th U.S. National Combustion Meeting Author Listing

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Acharya, V.	1C12, 2F07	Bond, R.	1C12	Chien, Y.-C.	1D04
Ackerman, E.	2G16	Bonilla, I.J.	2H03	Chintersingh, K.-I.A.	1G02
Aggarwal, S.K.	1C07	Bonville, L.J.	1G04, 1E16	Cho, J.	1C15, 2A10
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				Dalmiya, A.	2G04

<i>Author</i>	<i>Paper #</i>	<i>Author</i>	<i>Paper #</i>	<i>Author</i>	<i>Paper #</i>	<i>Author</i>	<i>Paper #</i>
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