2022 SPRING TECHNICAL MEETING
EASTERN STATES SECTIONS OF THE COMBUSTION INSTITUTE
University of Central Florida
Orlando, Florida
March 6-9, 2022

Sunday, March 6, 2022

15:00 – 17:00 **ESSCI Executive Board Meeting - HEC 101**
18:00 – 20:00 **Welcome Reception - HEC Lobby**

Monday, March 7, 2022

8:00 – 16:00 **Registration - HEC 101 Lobby**
8:00 – 8:20 **Welcome Remarks/Announcements - HEC 125**
Prof. Elizabeth A. Klonoff, Vice President for Research and Dean of the College of Graduate Studies, *University of Central Florida*
Prof. Michael Georgiopoulos, Dean of the College of Engineering and Computer Science, *University of Central Florida*

8:20 – 9:20 **Plenary Lecture – HEC 125**
Professor Tarek Echekki, *North Carolina State University*
Title: *Data-Based Modeling in Turbulent Combustion: Progress, Challenges, and Opportunities*
Session Chair: Michael E. Mueller, *Princeton University*

9:20 – 9:30 Break

	Cool Flames **HEC 125** **Session Chair: W. Sun**	**Energetic Materials** **HEC 118** **Session Chair: M.P. Burke**	**Data-Based Modeling: Kinetics and Fuels** **HEC 119** **Session Chair: H. Maldonado Colmán**
9:30	**1A01**: **The first observations of spherical gas-fueled cool diffusion flames** *M. Kim[1], K.A. Waddell[1], P.B. Sunderland[1], V. Nayagam[2], D.P. Stocker[3], D.L. Dietrich[3], Y. Ju[4], F.A. Williams[5], P.H. Irace[6], R.L. Axelbaum[6]* *[1]University of Maryland* *[2]Case Western Reserve University* *[3]NASA Glenn Research Center* *[4]Princeton University* *[5]University of California at San Diego* *[6]Washington University in St. Louis*	**1B01**: **Non-uniform burning propagation of nanothermites** *S. Kim[1], A. Johns[1], J. Wen[1,2], S. Deng[1]* *[1]Massachusetts Institute of Technology* *[2]University of Waterloo*	**1C01**: **Analysis of inlier and outlier compounds with respect to artificial neural network cetane number prediction accuracy** *T.J. Kessler, A. SubLaban, J.H. Mack* *University of Massachusetts Lowell*
9:50	**1A02: Study of diffusion cool and warm flames of Dimethyl ether at elevated pressure** *Z. Wang, C. Yan, Y. Lin, M. Zhou, B. Jiang, N. Liu, H. Zhong, Y. Ju* *Princeton University*	**1B02**: **Ignition and combustion of spherical boron synthesized by ball milling** *M. Mursalat[1], M. Schoenitz[1], E. L. Dreizin[1,2]* *[1]New Jersey Institute of Technology* *[2]Tomsk State University*	**1C02**: **An automated framework for nonlinear regression in Principal Component-based model reduction for reacting flows** *G. D'Alessio, S. Sundaresan, M.E. Mueller* *Princeton University*

	Cool Flames HEC 125 Session Chair: W. Sun	Energetic Materials HEC 118 Session Chair: M.P. Burke	Data-Based Modeling: Kinetics and Fuels HEC 119 Session Chair: H. Maldonado Colmán
10:10	**1A03: Observations of cool pool diffusion flames** *K.A. Waddell[1], H.J. Lee[1], V. Nayagam[2], R.L. Axelbaum[3], P.B. Sunderland[1]* *[1]University of Maryland* *[2]Case Western Reserve University* *[3]Washington University in St. Louis*	**1B03: Metal-based gas generating nano-energetic reactive composites** *P.M Gandhi, M. Schoenitz, E. Dreizin* *New Jersey Institute of Technology*	**1C03: Using shock tube species time-histories in Bayesian parameter estimation: Effective independent-data number and target selection** *H. Chen[1], W. Ji[1], S.J. Cassady[2], A.M. Ferris[2], R.K. Hanson[2], S. Deng[1],* *[1]Massachusetts Institute of Technology* *[2]Stanford University*
10:30 – 10:50 Break			
	Laminar Flame Speeds HEC 125 Session Chair: J. Jayachandran	**Powders HEC 118 Session Chair: S.H. Won**	**Turbulent Premixed Combustion HEC 119 Session Chair: V. Acharya**
10:50	**1A04: A new method for measuring the laminar burning speed at high pressures** *J. Shaffer[1], S. Zare[2], O.* Askari[1] *[1]West Virginia University* *[2]Mississippi State University*	**1B04: Spherical powders of reactive Al·Ti nanocomposite** *N. Rodriguez, D. Hastings, M. Schoenitz, E. Dreizin* *New Jersey Institute of Technology*	**1C04: Distributed turbulent premixed combustion: Radical and reaction zone behaviors** *K. VanderKam, M.E. Mueller* *Princeton University*
11:10	**1A05: Measurement of laminar burning speed of propylene, carbon dioxide and air mixtures** *Z. Lu[1], Z. Wang[2], H. Metghalchi[1], Y. Levendis[1]* *[1]Northeastern University* *[2]Princeton University*	**1B05: An experimental approach for studying rapid decomposition of diisopropyl methylphosphonate (DIMP) vapor** *E.I Senyurt, V. K. Hoffman, M. Schoenitz, E.L. Dreizin* *New Jersey Institute of Technology*	**1C05: Combined OH-PLIF and filtered Rayleigh scattering temperature measurements in a turbulent premixed bluff-body stabilized V-flame** *S. Price, N. Erskine, B.M. Cetegen* *University of Connecticut*
11:30	**1A06: Measurements of the laminar flame speed of propane/dimethyl-ether/air mixtures** *G. Kim, J. Weiner, R. Ghorpade, S.S. Vasu,* *University of Central Florida*	**1B06: Interaction of reactive material powder with plasma and shock generated by electric spark** *S. Mukhopadhyay, R. Shkromiuk, M. Schoenitz, E.L. Dreizin* *New Jersey Institute of Technology*	**1C06: Closure modeling for the conditional progress variable dissipation rate using the PDF transport equation and the influence of the conditional velocity model** *J. Lee, M.E. Mueller* *Princeton University*

11:50 – 13:00 Lunch on your own **13:00 – 14:00 ESSCI General Member Meeting – HEC 101**			
	Emissions: Noise and Soot **HEC 125** **Session Chair: J. Zhang**	**Biomass and Low-Temperature Kinetics** **HEC 118** **Session Chair: Q. Meng**	**Data-Based Modeling: Turbulent Combustion** **HEC 119** **Session Chair: G. D'Alessio**
14:00	**1A07: Entropy transfer functions of externally forced flames** *T. John, V. Acharya1, T. Lieuwen* *Georgia Institute of Technology*	**1B07: Ignition and combustion of microcrystalline cellulose in a Hencken burner** *P. Motiei[1], M. Ahmad[2], J.L. Goldfarb[2], J. O'Connor[1]* *[1]Pennsylvania State University* *[2]Cornell University*	**1C07: A dynamically partitioned adaptive chemistry methodology for efficient implementation of combustion chemistry** *P. Sharma, P. Pepiot* *Cornell University*
14:20	**1A08: Entropy generation by chemical heat release: Distributed heat release effects** *A. Laksana, P. Patki, T. John, V. Acharya, T. Lieuwen* *Georgia Institute of Technology*	**1B08: Applying Reactive Molecular Dynamics to simulate glucose and xylose pyrolysis** *M.J. Haselow, J.S. Haselow, P.R. Westmoreland* *North Carolina State University*	**1C08: Deep learning model for the instantaneous conditional progress variable dissipation rate in turbulent premixed combustion** *C.E. Lacey, S. Sundaresan, M.E. Mueller* *Princeton University*
14:40	**1A09: Large Eddy Simulation of the mechanisms of soot evolution in a turbulent nonpremixed bluff body flame** *H. Maldonado Colmán, P. Prakash Duvvuri, M.E. Mueller* *Princeton University*	**1B09: O_2-Dependent competition among reaction pathways of tetrahydrofuran oxidation** *A.L. Koritzke, M.G. Christianson, S. Hartness, N.S. Dewey, A.C. Doner, A.R. Webb, B. Rotavera* *University of Georgia*	**1C09: Universal kinetic subspace investigation using neural network for uncertainty quantification in nonpremixed flamelets** *B.C. Koenig, W. Ji, S. Deng* *Massachusetts Institute of Technology*
15:00	**1A10: Role of soot oxidation kinetics and subfilter models on soot evolution in turbulent nonpremixed flames** *P. Prakash Duvvuri, H. Maldonado Colmán, M.E. Mueller* *Princeton University*	**1B10: Model and experimental O_2 dependence of species from R + O_2 reactions in *n*-butane oxidation** *S.W. Hartness, N.S. Dewey, M.G. Christianson, A.L. Koritzke, A.C. Doner, A.R. Webb, B. Rotavera* *University of Georgia*	**1C10: DRGEP autoencoders: Physics-based data-driven low-dimensional manifolds for capturing complex chemistry** *N. Kincaid[1], A. Newale[1,2], P. Pepiot[1]* *[1]Cornell University* *[2]ANSYS, Inc.*

15:20 – 15:40 Break			
	Emissions: Nitrogen and Sulfur **HEC 125** **Session Chair: P. Sunderland**	**Polymers and Wicks** **HEC 118** **Session Chair: J. Urban**	**Adaptive/Automated Chemistry** **HEC 119** **Session Chair: S. Deng**
15:40	**1A11: Evaluating rate constants for N_2O + O using uncertainty quantification constrained by previous data** *J. Lee, C.E. LaGrotta, M.C. Barbet, M.P. Burke* *Columbia University*	**1B11: Numerical and experimental investigation of PMMA/air diffusion flame** *A. Jessup, H. Pace, D. Gallegos, L. Massa, G. Young* *Virginia Tech*	**1C11: Enabling automated detailed kinetic modeling of halogenated hydrocarbon combustion with Reaction Mechanism Generator** *D.S. Farina Jr.[1], S.K. Sirumalla[1,2], R.H. West[1]* *[1]Northeastern University* *[2]Entos Inc.*
16:00	**1A12: Towards understanding the fate of HNNO in flames** *Q. Meng, L. Lei, J. Lee, M.P. Burke* *Columbia University*	**1B12: Modified isoconversional analysis toward determining global pyrolysis kinetics for PAEK polymers** *M.S. Schwenger, J.F. Stanzione III, F.M. Haas* *Rowan University*	**1C12: Semi-automated generation of a chemical kinetic reaction mechanisms for *n*-pentane combustion** *V. Amiri, R. Asatryan, M.T. Swihart* *University at Buffalo*
16:20	**1A13: Kinetic and quantum chemical study of the gas-phase reactions between NH_3 and sulfur-containing fuel emissions** *R.M.I. Elsamra[1,2], R.K. Rahman[1], A.E. Masunov[1,3,4], SS. Vasu[1]* *[1]University of Central Florida* *[2]Alexandria University* *[3]South Ural State University* *[4]Moscow Engineering Physics Institute*	**1B13: Experimental study of dynamics of flames from discrete methanol fuel wicks in ullages** *S. Nair[1], H.F. Farahani[1], V. Raghavan[2], A.S. Rangwala[1]* *[1]Worcester Polytechnic Institute* *[2]Indian Institute of Technology*	**1C13: Coupling high throughput jet-stirred reactor experiments to experimental design algorithms: A step towards autonomous model development** *M.C. Barbet, R.E. Cornell, M.P. Burke* *Columbia University*

16:45 – 18:15 **Career Development Mentor-Mentee Workshop – HEC 101**
Hosted by Jacqueline O'Connor, *The Pennsylvania State University* and Perrine Pepiot, *Cornell University*

Tuesday, March 8, 2022

8:00 – 16:00 **Registration - HEC 101 Lobby**
8:15 – 8:20 **Announcements - HEC 125**

8:20 – 9:20 **Plenary Lecture – HEC 125**
Dr. Amy Mensch, *National Institute of Standards and Technology*
Title: *Production, Transport, and Deposition of Smoke in Fire Research*
Session Chair: Jacqueline O'Connor, *The Pennsylvania State University*

9:20 – 9:30 Transition to Morning Sessions

	Flame Synthesis **HEC 125** **Session Chair: C.S. McEnally**	**Firebrands** **HEC 118** **Session Chair: S. Kozhumal**	**Reciprocating Engines** **HEC 119** **Session Chair: C.-J. Sung**
9:30	**2A01: Investigation of on-substrate particle growth in TiO_2 layers deposited by flame synthesis** *M. Bhat, B.C. Koenig, S. Deng* *Massachusetts Institute of Technology*	**2B01: Cooperative spot ignition by idealized firebrands: Impact of fuel bed thermal interaction** *L. Zhu, J.L. Urban* *Worcester Polytechnic Institute*	**2C01: Evaluation of cold operation assisting strategies in a heavy-duty gasoline compression ignition engine** *L. Zhao[1], Y. Zhang[1], Y. Pei[1], A. Zhang[1], M. Ameen[2]* *[1]Aramco Americas: Aramco Research Center - Detroit* *[2]Argonne National Laboratory*
9:50	**2A02: Light Scattering and Laser-Induced Incandescence for the characterization of platinum nanoparticles manufactured by the Reactive Spray Deposition Technology** *E.K. Stefanidis, T. A. Ebaugh, S. Bliznakov,* *L.J. Bonville, R. Maric, F. Carbone* *University of Connecticut*	**2B02: Firebrand pyrometry with a spinning camera** *J.H. Baldwin, K. Decker, P.B. Sunderland* *University of Maryland*	**2C02: Influence of C_1-C_3 fuel composition on diesel-NG dual-fuel combustion performance and emissions under low load conditions** *C. Ulishney, J. Liu, C. Dumitrescu* *West Virginia University*
10:10	**2A03: Effects of the preheating temperature on flame-assisted spray pyrolysis of nickel-rich cathode materials** *J. Zhang, V.L. Muldoon, S. Deng* *Massachusetts Institute of Technology*	**2B03: Thermal quantification and ignition study of firebrand pile-exposed wildland-urban interface decking materials** *J.A. De Beer[1], J.A. Alascio[1], S.I. Stoliarov[1],* *M.J. Gollner[2]* *[1]University of Maryland* *[2]University of California, Berkeley*	**2C03: Experimental evaluation of ammonia, methane, and gasoline fuel blends in small scale spark ignited engines** *K.N. Vinod, M. Gore, T. Fang* *North Caroline State University*

10:30 – 10:50 Break			
	Flame Synthesis and Spray Flames **HEC 125** **Session Chair: F. Carbone**	**Pool Fires** **HEC 118** **Session Chair: R. Falkenstein-Smith**	**Plasma-Assisted Combustion** **HEC 119** **Session Chair: E. Cisneros Garibay**
10:50	**2A04: Synthesis of Al-doped LLZO thin-tape electrolytes for all-solid-state batteries using flame-assisted spray pyrolysis** *V.L. Muldoon, J. Zhang, S. Deng* *Massachusetts Institute of Technology*	**2B04: A study of kerosene pool burning on wavy water** *N.G. Sauer[1], H.-H. Ho[1], S. Nair[1], L. Zabilansky[2], A. Rangwala[1]* *[1]Worcester Polytechnic Institute* *[2]Naval Weapons Station Earle*	**2C04: Kinetic effects of non-equilibrium plasma on ammonia combustion** *J. Choe, W. Sun* *Georgia Institute of Technology*
11:10	**2A05: Synthesis of single-crystal nickel-rich cathode materials using flame-assisted spray pyrolysis** *J. Zhang, V.L. Muldoon, S. Deng* *Massachusetts Institute of Technology*	**2B05: Influence of turbulence on burning behavior of fuel slick on water** *M. Kottalgi, S. Nair, A. Rangwala* *Worcester Polytechnic Institute*	**2C05: Numerical modeling of inter-pulse coupling in nanosecond pulsed high frequency discharge ignition** *X. Mao[1], H. Zhong[1], Z. Wang[1], T. Ombrello[2], Y. Ju[1]* *[1]Princeton University* *[2]Wright-Patterson Air Force Base*
11:30	**2A06: Preferential vaporization impact on spray counterflow diffusion flame extinction** *S.J. Lim, F.L. Dryer, S.H. Won* *University of South Carolina*	**2B06: Burning behavior analysis of meso-scale pool fires using combustion product sampling** *H.-H. Ho[1], N. Sauer[1], M. Kottalgi[1], K. Arsava[2], A. Rangwala[1]* *[1]Worcester Polytechnic Institute* *[2]US Army Corps of Engineers*	**2C06: Feature selection for Gaussian process regression models of plasma assisted ignition using directed relation graphs** *I. Kabil, T. Lu* *University of Connecticut*
11:50 – 12:50	**Lunch on your own**		
12:55 – 13:55	**HEC 125** **Irv Glassman Young Investigator Lecture:** Professor Brandon Rotavera, *University of Georgia* **Title:** *The Importance of Reaction Mechanisms in Combustion* **Session Chair:** Paul Papas, *Raytheon Technologies Research Center*		

13:55 – 14:00 Transition to Afternoon Sessions			
	Biofuel Kinetics **HEC 125** **Session Chair: M. Haas**	**Droplets** **HEC 118** **Session Chair: L. Zhao**	**Gas Turbines and Rockets** **HEC 119** **Session Chair: O. Askari**
14:00	**2A07: Isomer-resolved detection of species from $\dot{R} + O_2$ reactions of ethyloxirane** *M.G. Christianson[1], A.C. Doner[1], M.M. Davis[1], A.L. Koritzke[1], J.M. Turney[1], H.F. Schaefer III[1], L. Sheps[2], D.L. Osborn[2], C.A. Taatjes[2], B. Rotavera[1]* *[1]University of Georgia* *[2]Sandia National Laboratories*	**2B07: Experimental and computational study of droplet-shockwave interaction for pure fluids and nanofluids** *J. Leung, M. Gurunadhan, S. Menon* *Louisiana State University*	**2C07: Thermal characterization of effusion cooled combustor liner panels** *K.R. Snyder, M. Boguszewski, B.M. Cetegen* *University of Connecticut*
14:20	**2A08: Synthesis and characterization of extended-alkyl oxymethylene ethers for compression ignition engine usage** *S.P. Lucas[1], A. Zdanocwicz[1], G.M. Cole[1], J. Zhu[2], C. McEnally[2], N.J. Labbe[3], J.C. Quinn[1], J. Luecke[4], G. Fioroni[4], F.L. Chan[1], A. Gilbert[1], B. Windom[1]* *[1]Colorado State University* *[2]Yale University* *[3]University of Colorado Boulder* *[4]National Renewable Energy Laboratory*	**2B08: Experimental study on evaporation and combustion of pure and nanofluid droplets** *J. Ahumada Lazo, R.-H. Chen* *University of Maryland Baltimore County*	**2C08: Reactor network modeling of a gas turbine to reduce NOx** *Z.P. Mohammed[1], R.K. Rahman[2], S. Vasu[2]* *[1]University of South Florida* *[2]University of Central Florida*
14:40	**2A09: Influence of stereochemistry on reaction pathways of 2,4-dimethyloxetanyl-peroxy isomers** *A.C. Doner[1], J. Zádor[2], B. Rotavera[1]* *[1]University of Georgia* *[2]Sandia National Laboratories*	**2B09: Multizone modeling and experiments of burning n-alkane droplets in elevated oxygen environments** *K. Retfalvi, P.E. DesJardin* *University at Buffalo*	**2C09: Temperature measurements in the reaction zone of a small-scale hybrid rocket combustor using near-infrared tunable diode laser absorption spectroscopy** *C. Becnel, M. Gurunadhan, S. Menon* *Louisiana State University*
15:00	**2A10: Development of sub-mechanisms for cyclic ethers: Alkyl-substituted oxiranes** *N.S. Dewey, B. Rotavera* *University of Georgia*	**2B10: High-speed imaging of the break up of liquid fuel droplets impacted by detonation waves** *D. Dyson[1], A. Arakelyan[1], N. Berube[1], S. Briggs[1], S. Menon[2], S.S. Vasu[1]* *[1]University of Central Florida* *[2]Georgia Institute of Technology*	**2C10: A numerical investigation of melt layer effects on hybrid combustion of liquefying fuels** *M. Gurunadhan, V. Viswamithra, S. Menon, K. Gonthier, A. Baran* *Louisiana State University*
15:20 – 15:40 Break			

	Sooting Tendencies HEC 125 Session Chair: P.P. Duvvuri	Fire Suppression and Spread HEC 118 Session Chair: P. Desjardin	Detonations and Supersonic Combustion HEC 119 Session Chair: C. Dedic
15:40	**2A11: Sooting tendencies of phenolic hydrocarbons** *Z. Xiang, F. Guo, D. Curtis, C.S. McEnally, L.D. Pfefferle, J. Zhu* *Yale University*	**2B11: Trifluroiodomethane (CF_3I)-Carbon Dioxide (CO_2) fire suppressants** *P. Papas[1], C. Cao[2], W. Kim[1], E. Baldwin[3], A. Chattaway[4]* *[1]Raytheon Technology Research Center* *[2]Collins Aerospace Applied Research and Technology* *[3]Collins Aerospace Kidde Technologies* *[4]Collins Aerospace Kidde Graviner Ltd.*	**2C11: Disturbance energy budget in gaseous detonations** *H. Rajagopalan[1], S.S. Dammati[2], V. Acharya[1], A.Y. Poludnenko[3,2], T. Lieuwen[1]* *[1]Georgia Institute of Technology* *[2]Texas A&M University* *[3]University of Connecticut*
16:00	**2A12: Sooting tendency of farnesane: A bio-derived jet fuel** *R.K. Rahman, F. Arafin, R. Greene, S. Vasu* *University of Central Florida*	**2B12: TGA, DSC, and FTIR analysis of gypsum plasterboards under varying heating rates** *H. Sezer[1], R. Paye[2], C. Geist[1], H. Fries[1], T. Borth[3], G.E. Gorbett[3], S.P. Kozhumal[3]* *[1]Georgia Southern University* *[2]Western Carolina University* *[3]Eastern Kentucky University*	**2C12: Investigation of the sensitivity of the deflagration to detonation transition to the ignition propensity and thermo-diffusive properties of mixtures** *N. Dexter-Brown, A. Hollander, J. Jayachandran* *Worcester Polytechnic Institute*
16:20	**2A13: Standards-compatible smoke points for mono- and un-substituted cycloalkane fuel components** *A. Adeniyi[1], C.H. Sohn[2], F.M. Haas[1]* *[1]Rowan University* *[2]Sejong University*	**2B13: Characterization of backdrafts generated from methane fires** *R. Falkenstein-Smith, C. Brown, T. Cleary* *National Institute of Standards and Technology*	**2C13: The effects of shocks and supersonic reactions over a wedge** *T. Brown, R. Hytovick, K. Ahmed* *University of Central Florida*
16:40	**2A14: Sooting tendencies of terpenes and hydrogenated terpenes as sustainable transportation biofuels** *J. Zhu[1], J.V. Alegre-Requena[3], P. Cherry[1], D. Curtis[1], B.G. Harvey[2], M.A. Jabed[3], S. Kim[3], C.S. McEnally[1], L.D. Pfefferle[1], J.-D. Woodroffe[2]* *[1]Yale University* *[2]US Navy, NAWCWD* *[3]Colorado State University*	**2B14: Radiation effects in hydrofluorocarbon/air flames: Analysis and modeling** *J. Tavares[1], E. Levi[1], V. Gururajan[2], J. Jayachandran[1]* *[1]Worcester Polytechnic Institute* *[2]Argonne National Laboratory*	**2C14: Manifold-based modeling for supersonic non-premixed turbulent combustion** *E. Cisneros–Garibay, M.E. Mueller* *Princeton University*
17:00 – 17:20 Break			

	Catalysts and Surfaces HEC 125 Session Chair: X. Mao	Oxy-Combustion and Supercritical CO_2 HEC 118 Session Chair: Z. Wang
17:20	**2A15: Thermo-catalytic decomposition of methane: Focus on nanostructure** *M. Nkiawete, R. Vander Wal* *The Pennsylvania State University*	**2B15: Premixed laminar oxycombustion of hydrogen with carbon dioxide as a working fluid** *N. Nasim, B. Nawaz, A. SubLaban, J.H. Mack* *University of Massachusetts Lowell*
17:40	**2A16: Removal of diisopropyl methyl phosphonate (DIMP) from heated metal oxide surfaces** *A. Vasudevan, E.I. Senyurt, M. Schoenitz, E.L. Dreizin* *New Jersey Institute of Technology*	**2B16: Methane injection characteristics in supercritical CO_2 environment** *R. Ghorpade, G. Kim, J. Weiner, S. Vasu* *University of Central Florida*
18:00	**2A17: Unsteady operation of functionally graded porous media burners** *G. D'Orazio, J. Ringsby, S. Sobhani* *Cornell University*	**2B17: Impact of particle size and particle-flow-wall coupling on pressurized oxy-combustion in a down-fired burner** *L. Li[1], V. Akkerman[1], Z. Yang[2], D. Magalhaes[2], R.L. Axelbaum[2]* *[1]West Virginia University* *[2]Washington University in Saint Louis*

18:30 – 20:30 Banquet

UCF FAIRWINDS Alumni Center, Ball rooms AB and Patio
12676 Gemini Blvd N, Orlando, FL 32816

Wednesday, March 9, 2022

8:15 – 8:20 **Announcements - HEC 125**

8:20 – 9:20 **Plenary Lecture – HEC 125**
Professor Jayanta Kapat, *University of Central Florida*
Title: *Research at CATER on Sustainable Energy Systems*
Session Chair: Gihun Kim, *University of Central Florida*

9:20 – 9:30 Transition to Morning Session

	Alternative Fuels: Hydrogen **HEC 125** **Session Chair: B. Rotavera**	**Diagnostics** **HEC 118** **Session Chair: S. Sobhani**
9:30	**3A01: Combustion characterization of high-fuel percentage, air-diluted mixtures of H_2 in a shock tube** *M. Pierro, J. Urso, C. Kinney, J. McGaunn, C. Dennis, S. Vasu* *University of Central Florida*	**3B01: Optical diagnostics for characterizing local gas conditions in a scramjet engine** *A.J. Metro[1], A. Kim[1], R.D. Rockwell[1], A.D. Cutler[2], C.E. Dedic[1]* *[1]University of Virginia* *[2]The George Washington University*
9:50	**3A02: Dilution effect in shock tube autoignition delay study of hydrogen-air mixture** *Y. Peng, W. Sun* *Georgia Institute of Technology*	**3B02: Probing fuel-rich oxidation of 1,3-butadiene at high-temperature using quantum-cascade-laser dual-comb spectroscopy** *R.K. Rahman[1], F. Arafin[1], R. Horvath[2], M. Geiser[2], S. Vasu[1]* *[1]University of Central Florida* *[2]IRSweep AG*
10:10	**3A03: NOx production from hydrogen-methane blends** *B. Breer[1], H.P. Rajagopalan[1], C. Godbold[1], H. Johnson II[1], B. Emerson[1], V. Acharya[1], W. Sun[1], D. Noble[2], T. Lieuwen[1]* *[1]Georgia Institute of Technology* *[2]Electric Power Research Institute (EPRI)*	**3B03: Implementation of a technique for low-pressure measurement conditions in shock tubes** *M. Albright, F. Arafin, J. Higgs, S. Vasu* *University of Central Florida*

10:30 – 10:50 Break

	Alternative Fuels: Ammonia HEC 125 Session Chair: R. West	Fire Modeling HEC 118 Session Chair: S. Nair
10:50	**3A04: Hydrogen-ammonia-natural gas mixtures ignition delay times measurements** *J.B. Baker, R.K. Rahman, J. Higgs, S. Vasu* *University of Central Florida*	**3B04: Detailed chemistry and radiation opposed flame spread model to predict flammability limits in microgravity** *K. Budzinski, P.E. DesJardin* *University at Buffalo*
11:10	**3A05: An experimental and kinetic modeling study of NH_3 oxidation by NO_2 in a jet-stirred reactor** *R.E. Cornell[1,2], M.C. Barbet[1], M.P. Burke[1]* *[1]Columbia University* *[2]U.S. Army DEVCOM AC, Picatinny*	**3B05: Development of gypsum thermo-chemistry model with variable heating rate** *S.P. Kozhumal[1], H. Sezer[2]* *[1]Eastern Kentucky University* *[2]Georgia Southern University*
11:30	**3A06: A study on the impact of elevated air temperatures on flame stability and NOx emissions of methane-ammonia-air mixtures in a premixed swirl combustor** *V. Viswamithra, M. Gurunadhan, S. Menon* *Louisiana State University*	**3B06: Development, training, and testing of an artificial intelligence model for fire detection** *S.P. Kozhumal, G.E. Gorbett* *Eastern Kentucky University*
11:50 – Adjourn **Thank you for attending and we hope to see you in Vancouver for the 39th International Symposium on Combustion!**		

2022 EASTERN STATES SPRING TECHNICAL MEETING AUTHOR LISTING