Frederick L. Dryer

(September 15, 2019)

Professor Emeritus

Mechanical and Aerospace Engineering
D-302-A Engineering Quadrangle
Princeton University
Princeton NJ 08544
Email: fldryer@princeton.edu
Cell: 609-306-1028

Educational Foundation
Distinguished Research Professor

Mechanical Engineering
300 Main Street, Rm A-122
University of South Carolina
Columbia, SC 29208
Email: DryerF@mailbox.sc.edu
Cell: 609-306-1028

Research Gate: https://www.researchgate.net/profile/Frederick_Dryer
Google Scholar: http://scholar.google.com/citations?user=-zDOiYQAAAAJ&hl=en
Mendeley: https://www.mendeley.com/profiles/frederick-dryer/
E Tree: https://academictree.org/etree/peopleinfo.php?pid=497109

Dr. Dryer (BAE'66, Rensselaer Polytechnic Institute) obtained his Ph.D. in Aerospace and Mechanical Sciences at Princeton University (1971) and was engaged in combustion research at Princeton University for more than 50 years. He served on the Professional Research Staff from 1971 – 1981, joined the tenured faculty in the Mechanical and Aerospace Engineering in 1981 and became Professor Emeritus in 2013. He also holds an honorary faculty position in Mechanical Engineering at the University of Melbourne, AU (since 2015). Dr. Dryer joined the University of South Carolina as an Educational Foundation Distinguished Research Professor in Mechanical Engineering in October 2016. His extensive research facilities developed at Princeton University have been relocated to become part of the recently established *Fuels, Energy Conversion, and Propulsion Technologies Research* facilities within the University of South Carolina McNair Center.

Along with a number of collaborators at SC and elsewhere, Dr. Dryer is actively engaged in experimental and computational research involving a wide spectrum of topics on kinetic and physical fuel property effects relevant to optimizing the fuels/energy conversion interface for ground-based power generation/transportation, aircraft applications, and chemical propulsion. His fundamental research interests are focused on applications-driven needs for advancing dynamic performance, energy resource (carbon) utilization efficiency, reduced air-pollutant emissions, and mitigation of fire-safety-related hazards associated with gaseous and liquid flammable production and use. His research experience encompasses a wide range of fuels from hydrogen, syngas, natural gas, chemical process and low BTU gases to individual liquid hydrocarbon and oxygenated species, their mixtures, petroleum-derived real fuels (including gasolines, diesel fuels, HFO's, and crudes) and (both hydrogenated and oxygenated) alternative components derived from natural gas and bio-resources blended with petroleum fuels.

Dr. Dryer has published extensively and consulted for the government, industry, and legal profession. His services on advisory committees include efforts for the National Materials Advisory Board/National Research Council (five times), NASA, DOE-BES, DOE-ARPA-E, DARPA, ARO, and NIST. He is a former associate editor and editorial board member of Combustion Science and Technology, co-editor for the Proceedings of the 26th and 27th International Symposiums on Combustion, and a former editorial board member of the International Journal of Chemical Kinetics and of Progress in Energy and Combustion Science. He is currently a member of the Combustion Institute (2000 Silver Medal, 2012 Egerton Gold Medal Awardee; 1976/1981/2014 plenary speaker), the American Society of Mechanical Engineers (Fellow), the Society of Automotive Engineers (Fellow), the American Institute of Aeronautics and Astronautics (Associate Fellow; 2014 Propulsion and Combustion Medal), the American Chemical Society, and the National Fire Protection Association.

Education

Ph.D. – Aerospace and Mechanical Sciences - Princeton University, 1972
M. A. – Aerospace and Mechanical Sciences - Princeton University, 1968
Bachelor of Aeronautical Engineering – Rensselaer Polytechnic Institute, 1966

Professional History

2016 – Present	Educational Foundation Distinguished Research Professor, Mechanical Engineering, University of South Carolina
2015 – Present	Professorial Fellow, Mechanical Engineering, University of Melbourne, Australia
2013 – Present	Professor Emeritus, Senior Scholar, Mechanical and Aerospace Engineering, Princeton
1983 – 2013	Professor, Mechanical and Aerospace Engineering, Princeton University
1987 – 1990	Associate Dean of Academic Affairs, School of Engineering and Applied Science, Princeton University
1984 – 1987	Undergraduate Departmental Representative, Mechanical and Aerospace Engineering, Princeton University
1982 – 1983	Associate Professor, Mechanical and Aerospace Engineering, Princeton University
1977 – 1982	Lecturer, Mechanical and Aerospace Engineering, Princeton University
1976 – 1981	Research Engineer, Mechanical and Aerospace Engineering, Princeton University
1972 – 1976	Professional Research Staff Member of Guggenheim Laboratories for the Aerospace Propulsion Sciences, Princeton University
1971 – 1972	Research Associate, Princeton University

Professional Activities and Honors:

Professional Memberships:

The Societies of Sigma Gamma Tau, Sigma Xi, Tau Beta Pi, American Chemical Society, American Society of Automotive Engineers (Fellow), American Institute of Aeronautics and Astronautics (Associate Fellow), American Society of Engineering Educators, American Society of Mechanical Engineers (Fellow), The Combustion Institute, National Fire Protection Association.

Honors:

2018 Fellow, The Combustion Institute, Pittsburgh, PA.

2014 Propulsion and Combustion Award, American Institute of Aeronautics and Astronautics.

2012 Alfred C. Egerton Gold Medal recipient, The Combustion Institute.

2011 Fellow, American Society of Mechanical Engineers.

2010 Assoicate Fellow, American Institute of Aeronautics and Astronautics.

2008 Fellow, Society of Automotive Engineers; Fellow.

2000, Silver Medal, The Combustion Institute (28th International Combustion Symposium)..

National Committee and Advisory Board Memberships:

Member, International Scientific Advisory Board, Cluster of Excellence “Tailor Made Fuels from Biomass”, RWTH, Aachen, Germany 2008 – 2018.

National Materials Advisory Board/National Research Council Committee to Identify Needs to Foster Improved Fire Safety in the United States 2002–2003.

Committee on Fire Safe Fuels for Aircraft, National Materials Advisory Board, Commission on Engineering and Technical Systems, National Research Council, 1996–1997.

Committee on Energy Conservation in the Processing of Industrial Materials, National Materials Advisory Board, Commission on Engineering and Technical Systems, National Research Council, 1990–1993.

NASA Scientific Advisory Panel on Atmospheric Effects of Aviation Project (AEAP), Earth Sciences and Applications Divisions, 1993–1995.

Chair, Engine Emissions Trace Chemistry Sub-Committee, NASA Atmospheric Advisory Panel on Atmospheric Effects of Stratospheric Aircraft (AESA), Earth Sciences and Applications Divisions, Office of Space Science and Applications, 1993–1995.

National Academy of Sciences NRC Panel on Impacts of Diesel Powered Light Duty Vehicles, 1979-1980.

National Academy of Sciences NRC Carbon Monoxide Control Assessment Panel, 1980.

Editorial Activities:

Editorial Board Member, Progress in Energy and Combustion Science, 2002–2005.

Co-organizer, of the Droplets and Sprays Colloquium for the 29th International Symposium on Combustion, Sapporo, Japan, July 21–26, 2002.

Editorial Board, International Journal of Chemical Kinetics, 1997–2002.

Co-editor (and Co-chair, Publication Committee) 27th International Combustion Symposium Proceedings, Boulder CO, The Combustion Institute, Pittsburgh, PA, July 1998.

Co-editor (and Co-chair, Publication Committee) 26th International Combustion Symposium, The Combustion Institute, Pittsburgh, PA, 1996.

Editorial Board, Combustion Science and Technology, 1986–1991.

Associate Editor, Combustion Science and Technology, 1977-1986.

Review Activities:

Proposal Review: ACS, ARO, DOE, NASA, NSF, ONR, NIST Technical Proposals.

Reviewer: Combust. Flame, Combust. Sci. Tech., Energy and Fuels, Enviro Sci. Tech., Fuel, Int. J. Heat Transfer, Int. J. Chem. Kin., J. Phys. Chem., Proc. Combust. Ins., AIAA Journals, and AICHE.

Selected Invitations:

Invited Contributor, Mathematical modelling of gas-phase complex reaction systems: Pyrolysis and Combustion, T. Faravelli, F. Manenti, E. Ranzi eds., Computer Aided Chemical Engineering Series, Vol 45 Elsevier, (2019). Co Author, Chapter 10.

Invited Speaker, Panel on Industrial Impacts of the Institute, 37th International Symposium on Combustion, Dublin, IRE, August 2, 2018.

Invited Speaker, “Toward Major Improvements in Efficiency and Emissions of Internal Combustion Piston Engines”, 33rd American Society for Gravitational and Space Research Conference, Seattle WA, 25-28 October 2017,

Invited Speaker, “Combustion and Emissions Properties of Heavy Oils”, King Abdullah Science and Technology Future Fuels Workshop, Thuwal SA, March 7-9, 2016.

Invited Plenary Speaker, 35th International Symposium on Combustion, “Chemical Kinetic and Combustion Characteristics of Transportation Fuels”, San Francisco, CA, August 8, 2014.

Invited Speaker, “Emulating the Combustion Behavior of Real Petroleum-Derived and Alternative Fuels”, *Bilger Plenary Lecture, 2011 Proceedings of the Australian Combustion Symposium,* University of Newcastle, Whitesands Conference Centre, Shoal Bay Resort and Spa, NSW Australia, Nov. 29 – Dec. 1.

Invited Speaker, “Surrogate Mixtures for Describing Real Fuel Combustion: Challenges and Recent Progress,” *Technology Watch Day on Future Biofuels*, Tailor-Made Fuels from BioMass (TMFB), RWTH Aachen University, Aachen City, Germany, May 24, 2011.

Invited Speaker, “Recent Studies on High-Hydrogen-Content Power Generation and Liquid Jet Aircraft Fuels,” *GE Energy Combustion Symposium, GE Energy*, Greenville, SC, January 25−26, 2011.

Invited Topical Paper, “Surrogate Mixtures for Describing Real Fuel Combustion: Challenges and Recent Progress,” 7th *US National Combustion Meeting (Combustion Institute)*, Georgia Institute of Technology, Atlanta, GA, March 20−23, 2011.

Invited Speaker, College of Engineering & CS MMAE Distinguished Speaker Series, University of Central Florida, Orlando, FL, November 18−19, 2010.

Invited Speaker, *20th Italian National Heat Transfer Conference*, Maratea, Italy. June 25 – 27, 2002.

Hottel Lecturer, *Hottel Lecture Series on Energy and Combustion*, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA, 1991.

Invited Contributor, (with C.K. Westbrook), "Chemical Kinetics and Modeling of Combustion Processes", Invited Paper, *18th International Symposium on Combustion*, The Combustion Institute, Pittsburgh, PA, 1981, p. 749

Invited Contributor, "Water Addition to Practical Combustion Systems - Concepts and Applications", *16th International Symposium on Combustion*, The Combustion Institute, Pittsburgh, PA, 1977, p. 279.

Industrial Scientific Advisory Boards

Science Advisory Board, Knite Corporation, Princeton, NJ. 2005 – Present
Environmental Advisory Board, NetJets Inc., Woodbridge, NJ. 2007 – 2010
Science Advisory Board, ORYXE International, Irvine, CA. 2005 – 2009

Archival Publications, 2010 – Present

- S. Dooley, S.H. Won, and F.L. Dryer, "Surrogate Fuels and Combustion Characteristics of Liquid Transportation Fuels", Chapter 10 in *Computer-Aided Chemical Engineering Mathematical Modelling of Gas-Phase Complex Reaction Systems: Pyrolysis and Combustion* **45**, (T. Faravelli, F. Manenti, E. Ranzi, eds.) Elsevier B.V. pp. 513 – 592.
- S.H. Won, N. Rock, S.J. Lim, S. Nates, D. Carpenter, B. Emerson, T. Lieuwen, T. Edwards, and F.L. Dryer, "Preferential Vaporization Impacts on Lean Blow-Out of Liquid Fueled Combustors", *Combust Flame* **205** 295-3-4 (2019). https://doi.org/10.1016/j.combustflame.2019.04.008
- T.I. Farouk, D. Dietrich, and F.L Dryer, "Three Stage Cool Flame Droplet Burning Behavior of n-Alkane Droplets at Elevated Pressure Conditions: Hot, Warm and Cool Flame", *Proc Combust Ins* **37** 3353-3361 (2019). https://doi.org/10.1016/j.proci.2018.09.015
- M.F. Alam, A.C. Aghdt, F.L Dryer and T.I. Farouk, "Oscillatory Cool Flame Combustion Behavior of Submillimeter Sized n-Alkane Droplet under Near Limit Conditions", *Proc Combust Ins* **37** 3383-3391 (2019). https://doi.org/10.1016/j.proci.2018.05.151
- F.M. Haas, S.H. Won, F.L. Dryer, and C. Pera, "Lube Oil Chemistry Influences on Autoignition as Measured in an Ignition Quality Tester", *Proc Combust Ins* **37** 4645-4654 (2019). https://doi.org/10.1016/j.proci.2018.06.165
- K. Dussan, S.H. Won, A. Ure, F.L Dryer, and S. Dooley, "Chemical Functional Group Descriptor for Ignition Propensity of Large Hydrocarbon Liquid Fuels", *Proc Combust Ins* **37** 5083-5093 (2019). https://doi.org/10.1016/j.proci.2018.05.151
- F.E. Alam, S.H. Won, F.L. Dryer, and T.I. Farouk, "Ozone-Assisted Cool Flame Combustion of Sub-millimeter Sized n-alkane Droplets at Atmospheric and Higher Pressure", *Combust Flame* **195** 220-231 (2018). https://doi.org/10.1016/j.combustflame.2018.01.015
- S.H. Won, F.M. Haas, S. Dooley, F.L. Dryer, and T. Edwards, "Reconstruction of Chemical Structure of Real Fuel by Surrogate Formulation Based Upon Combustion Property Targets", *Combust Flame* **183** 39-49 (2017). https://doi.org/10.1016/j.combustflame.2017.04.032
- T.M. Foong, M.J. Brear, K.J. Morganti, G. da Silva, Y. Yang, and F.L. Dryer, "Modeling End-Gas Autoignition of Ethanol/Gasoline Surrogate Blends in the Cooperative Fuel Research Engine", *Energy Fuels* **31** 2378-2389 (2017). http://dx.doi.org/10.1021/acs.energyfuels.6b02380
- F.E. Alam, F.M. Francis, T.I. Farouk, and F.L. Dryer, "Influence of Trace Nitrogen Oxides on Natural Gas Oxidation: Flow Reactor Measurements and Kinetic Modeling", *Energy Fuels* **31** 2360-2369 (2017). http://dx.doi.org/10.1021/acs.energyfuels.6b02369
- T.I. Farouk, Y. Xu, C.T. Avedisian, and F.L. Dryer, "Combustion Characteristics of Primary Reference Fuels (PRF) Droplets: Single Stage High Temperature Combustion to Multistage "Cool" Flame Behavior", *Proc Combust Ins* **36** 2585-2594 (2017). http://dx.doi.org/10.1016/j.proci.2016.07.066
- T.I. Farouk, F.L. Dryer, D. Dietrich, and F. E. Alam, "Isolated n-Decane Droplet Combustion – Dual Stage and Single Stage Transition to "Cool Flame" Droplet Burning" *Proc Combust Ins* **36** 2523-2530 (2017). http://dx.doi.org/10.1016/j.proci.2016.07.015
- S.F. Ahmed, J. Santner, F.L. Dryer, B. Padak, and T.I. Farouk, Conditions Relevant to Gas Turbine Operation, Part 2: NOx in High Hydrogen Content Fuel Combustion at Elevated Pressure", *Energy Fuels*, **30** 7691–7703 (2016). http://dx.doi.org/10.1021/acs.energyfuels.6b00421

- J. Santner, S.K. Ahmed, T. Farouk, and F.L. Dryer "Computational Study of NOx Formation at Conditions Relevant to Gas Turbine Operation: Part 1, *Energy Fuels* **30** 6745–6755 (2016). http://dx.doi.org/10.1021/acs.energyfuels.6b00420
- C-W. Zhou, Y. Li, E. O'Connor, K.P. Somers, S. Thion, C. Keesee, O. Mathieu, E.L. Petersen, T.A. DeVerter, M.A. Oehlschlaeger, G. Kukkadapu, C-J. Sung, M. Alrefae, F. Khaled, A. Farooq, P. Dirrenberger, P-A. Glaude, F. Battin-Leclerc, J. Santner, Y, Ju, T. Held, F.M. Haas, F.L. Dryer, and H.C. Curran, "A Comprehensive Experimental and Modeling Study of Isobutene Oxidation, *Combust Flame* **167** 353-379 (2016). http://dx.doi.org/10.1016/j.combustflame.2016.01.021
- S.H. Won, F.M. Haas, A. Tekawade, G. Kosiba, M.A. Oehlschlaeger, S. Dooley and F.L. Dryer, "Combustion Characteristics of C_4 iso-Alkane Oligomers: Experimental Characterization of iso-Dodecane as a Jet Fuel Surrogate Component", *Combust Flame* **165** 137-143 (2016). http://dx.doi.org/10.1016/j.combustflame.2015.11.006
- S.H. Won, P.S. Veloo, S. Dooley, J. Santner, F.M. Haas, Y. Ju, F.L. Dryer, "Predicting the Global Combustion Behaviors of Petroleum-Derived and Alternative Jet Fuels by Simple Fuel Property Measurements", *Fuel* **168** 34-36 (2016). http://dx.doi.org/10.1016/j.fuel.2015.11.026
- F.E. Alam, F.L. Dryer, and T.I. Farouk, "Effectiveness of Xenon as a Fire Suppressant under Microgravity Combustion Conditions", *Combust Sci Technol* **188** 145-165 (2015). http://dx.doi.org/10.1080/00102202.2015.1085033
- F.M. Haas and F.L. Dryer, "Rate Coefficient Determinations for H + NO_2 → OH + NO from High Pressure Flow Reactor Measurements", *J Phys Chem A* ***119*** 7792–7801 (2015). Special Issue. http://dx.doi.org/10.1080/00102202.2015.1085033
- J.S. Heyne, S. Dooley, Z Serinyel, F.L. Dryer, and H.C. Curran, "Decomposition Studies of Isopropanol in a Variable Pressure Flow Reactor", *Zeitschrift fur Physikalische Chemie* **229** 881–907 (2015). Special Issue. http://dx.doi.org/10.1515/zpch-2014-0630
- F.L. Dryer, "Chemical Kinetic and Combustion Characteristics of Transportation Fuels", *Proc Combust Ins* **35** 117-144 (2015). *Invited Plenary*. http://dx.doi.org/10.1016/j.proc.2014.09.008
- T.I. Farouk, M.C. Hicks, and F. L. Dryer, "Multistage Oscillatory "Cool Flame" Behavior for Isolated Alkane Droplet Combustion in Elevated Pressure Microgravity Condition", *Proc Combust Ins* **35** 1701–1708 (2015). http://dx.doi.org/10.1016/j.proci.2014.06.015
- E.A. Alam, Y.C. Liu, C.T. Avedisian, F.L. Dryer, and T.I. Farouk, "A Detailed Numerical Simulation of Spherically Symmetric n-Butanol Droplet Combustion and Comparisons with Experimental Data", *Proc Combust Ins* **35** 1693–1700 (2015). http://dx.doi.org/10.1016/j.proci.2014.06.043
- K.J. Morganti, T.M. Foong, M.J. Brear, G. da Silva, Y. Yang, and F.L. Dryer, "The Autoignition of Liquefied Petroleum Gas (LPG) in Spark-Ignition Engines", *Proc Combust Ins* **35** 2933–2940 (2015). http://dx.doi.org/10.1016/j.proci.2014.06.070
- J. Santner, F.M. Haas, F.L. Dryer, and Y. Ju, "High Temperature Oxidation of Formaldehyde and Formyl Radical: A Study of Laminar 1,3,5-Trioxane Burning Velocities", *Proc Combust Ins* **35** 687–694 (2015). http://dx.doi.org/10.1016/j.proci.2014.05.014
- A. Sudholt, C. Liming, C., J. Heyne, F.M. Haas, F.L. Dryer, and H. Pitsch, "Ignition Characteristics of a Bio-Derived Class of Saturated and Unsaturated Furans for Engine Applications", *Proc Combust Ins* **35** 2957-2965 (2015). http://dx.doi.org/10.1016/j.proci.2014.06.147
- S.M. Burke, U. Burke, R. Mc Donagh, O. Mathieu, I. Osorio, C. Keesee, A. Morones, E.L. Petersen, W. Wang, T.A. DeVerter, M.A. Oehlschlaeger, B. Rhodes, R.K. Hanson, D.F. Davidson, B.W. Weber, C.-J. Sung, J. Santner, Y. Ju, F.M. Haas, F.L. Dryer, E.N. Volkov, E.J.K. Nilsson, A.A. Konnov, M. Alrefae, F. Khaled, A. Farooq, P. Dirrenberger, P.-A. Glaude, F. Battin-Leclerc, H.J. Curran, "An Experimental and Modeling Study of Propene Oxidation. Part 2: Ignition Delay Time and Flame Speed Measurements", *Combust Flame* **162** 296-314 (2015). http://dx.doi.org/10.1016/j.combustflame.2014.07.032
- S.M. Burke, W. Metcalfe, O. Herbinet, F. Battin-Leclerc, F.M. Haas, J. Santner, F.L. Dryer, H.J. Curran, "An Experimental and Modeling Study of Propene Oxidation. Part 1: Speciation Measurements in Jet-stirred and Flow Reactors", *Combust Flame* **161** 2765-2784 (2014). http://dx.doi.org/10.1016/j.combustflame.2014.05.010

- S. Dooley, J. Heyne, S.H. Won, P. Dievart, Y. Ju, and F.L. Dryer, "On the Importance of a Cycloalkane Functionality in the Oxidation of a Real Fuel", *Energy Fuels* **28** 7649−7661 (2014). http://dx.doi.org/10.1021/ef5008962
- F.L. Dryer, FM. Haas, J. Santner, T. Farouk, and M. Chaos, "Interpreting Chemical Kinetics from Complex Reaction-Advection Diffusion Systems: Modeling of Flow Reactors and Related Experiments", *Progress Energy Combust Sci* **44** 19-39 (2014). http://dx.doi.org/10.1016/j.pecs.2014.04.002.
- F.L.Dryer, S. Jahangirian, S. Dooley, S.H. Won, J. Heyne, V. Iyer, T.A., Litzinger , R.J. Santoro , "Emulating the Combustion Behavior of Real Jet Aviation Fuels by Surrogate Mixtures from Hydrocarbon Fluid Blends", *Energy Fuels* **28** 3474–3485 (2014). http://dx.doi.org/10.1021/ef500284x.
- V.R. Iyer, S.S. Iyer, M.J. Linevsky, T.A. Litzinger, R.J. Santoro, S. Dooley, F.L. Dryer, and C.J. Mordaunt, "Simulating the Sooting Propensity of JP-8 with Surrogate Fuels from Hydrocarbon Fluids", *AIAA J Prop Power* **30** 1410-1418 (2014). http://dx.doi.org/10.2514/1.B35139
- K. Morganti, T.M. Foong, M. Brear, G. Da Silva, Y. Yang, F.L. Dryer, "Design and Analysis of a Modified CFR Engine for the Octane Rating of Liquefied Petroleum Gases (LPG)", *SAE Int J Fuels Lubr.* **7** 283-300, 2014, http://dx.doi.org/10.4271/2014-01-1474
- S.H. Won, S. Dooley, P.S. Veloo, H. Wang, M.A. Oehlschlaeger, F. L Dryer and Y. Ju, "The Combustion Properties of 2,6,10-Trimethyl Dodecane and a Chemical Functional Group Analysis", *Combust Flame* **161** 826-834 (2014). http://dx.doi.org/10.1016/j.combustflame.2013.08.027
- J. Santner, F.M. Haas, F.L. Dryer, and Y. Ju, "Uncertainties in Interpretation of High Pressure Spherical Flame Propagation Rates Due to Thermal Radiation", *Combust Flame* **161** 147–153 (2014). http://dx.doi.org/10.1016/j.combustflame.2013.08.008
- D.L. Dietrich, V. Nayagam, M.C. Hicks, P.V. Ferkul, F.L. Dryer, T. Farouk, B.D. Shaw, H.K. Suh, M.Y. Choi, Y.C. Liu, C.T. Avedisian, and F.A. Williams, "Droplet Combustion Experiments Aboard the International Space Station", *Microgravity Sci Technol* **26**, 66-76 (2014). http://dx.doi.org/10.1007/s12217-014-9372-2
- T.I. Farouk and F.L. Dryer, "Isolated *n*-Heptane Droplet Combustion in Microgravity: "*Cool Flames"*-Two-stage Combustion", *Combust Flame* **161** 565–581 (2014). http://dx.doi.org/10.1016/j.combustflame.2013.09.011
- T.M. Foong, K.J. Morganti, M.J. Brear, G. da Silva, Y. Yang, F.L. Dryer, "The Octane Numbers of Ethanol Blended with Gasoline and its Surrogates", *Fuel* **115** 727-739 (2014). http://dx.doi.org/10.1016/j.fuel.2013.07.105
- F.M. Haas and F.L. Dryer, "Application of Blending Rules for Ignition Quality Metrics: A comment on ''A linear-by mole Blending Rule for Octane Numbers of n-heptane/iso-octane/toluene Mixtures'', *Fuel* **120** 240–242 (2014). http://dx.doi.org/10.1016/j.fuel.2013.10.025
- J.S. Heyne and F.L. Dryer, "Dehydration Rate Measurements for *tertiary*-Butanol in a Variable Pressure Flow Reactor", *J Phys Chem A* **117** 8997–9004 (2013). http://dx.doi.org/10.1021/jp404143f
- J.S. Heyne and F.L. Dryer, "Uncertainty Analysis in the Use of Chemical Thermometry: A Case Study with Cyclohexene", *J Phys Chem A* **117** 5401–5406 (2013). http://dx.doi.org/10.1021/jp402982y
- K.J.Morganti, T.M. Foong, M.J. Brear, G. da Silva, Y. Yang, and F.L. Dryer, " The Research and Motor Octane Numbers of Liquified Petroleum Gas (LPG), *Fuel* **108** 797–811 (2013). http://dx.doi.org/10.1016/j.fuel.2013.01.072
- T.M. Foong, K.J. Morganti, M.J. Brear, G. da Silva, Y. Yang and F.L. Dryer, "The Effect of Charge Cooling on the RON of Ethanol/Gasoline Blends", SAE 13PFL-0630, 2013. Published in *SAE Transactions*. http://dx.doi.org/10.1016/j.fuel.2013.07.105
- P. Diévart, H.H. Kim, S.H. Won, Y. Ju, S. Dooley, F. Dryer, W. Wang, and M. Oehlschlaeger, "The Combustion Properties of 1,3,5-Trimethylbenzene and a Kinetic Model", *Fuel* **109** 125–136 (2013). http://dx.doi.org/10.1016/j.fuel.2012.11.069
- Y.C. Liu, T. Farouk, A.J. Savas, F.L. Dryer, and C.T. Avedisian," On the Spherically Symmetrical Combustion of Methyl Decanoate Droplets and Comparisons with Detailed Numerical Modeling", *Combust Flame* **160** 641–655 (2013). http://dx.doi.org/10.1016/j.combustflame.2012.11.006.
- T.I. Farouk, Y.C. Liu, A.J. Savas, C.T. Avedisian, and F.L. Dryer, "Sub-millimeter Sized Methyl Butanoate Droplet Combustion: Microgravity Experiments and Detailed Numerical Modeling", *Proc Combust Ins* **34** 1609–1616 (2013). http://dx.doi.org/10.1016/j.proci.2012.07.074.

- J. Santner, F.L Dryer, and Y. Ju, “The Effects of Water Dilution on Hydrogen, Syngas ,and Ethylene Flames at Elevated Pressure *Proc Combust Inst* **34** 719–726 (2013). http://dx.doi.org/10.1016/j.proci.2012.06.065.
- H. Guo, W. Sun, F. M Haas, F. L Dryer, and Y. Ju, “Measurements of H_2O_2 in Low Temperature Dimethyl Ether Oxidation”, *Proc. Combust. Inst.* **34** 573–581 (2013). http://dx.doi.org/10.1016/j.proci.2012.05.056.
- T.I. Farouk and F.L. Dryer, “On the Extinction Characteristics of Alcohol Droplet Combustion under Microgravity Conditions – A Numerical Study”, *Combust Flame* **159** 3208–3223 (2012). http://dx.doi.org/10.1016/j.combustflame.2012.04.005.
- S. Dooley, S.H. Won, S. Jahangirian, Y. Ju, F.L. Dryer, H. Wang, M.A. Oehlschlaeger “The Combustion Kinetics of a Synthetic Paraffinic Jet Aviation Fuel and a Fundamentally Formulated, Experimentally Validated Surrogate Fuel”, *Combust Flame* **159** 3014-3020 (2012). http://dx.doi.org/10.1016/j.combustflame.2012.04.010
- X. Hui, A. Das, K. Kumar, K., C-J. Sung, S. Dooley, and F.L. Dryer, “Laminar Flame Speeds and Extinction Stretch Rates of Selected Aromatic Hydrocarbons”, *Fuel* **97** 695-702 (2011). http://dx.doi.org/10.1016/j.fuel.2012.02.045.
- P. Diévart, S-H Won, S. Dooley, F.L Dryer, and Y. Ju, “Development and Validation of a Kinetic Model for Methyl Decanoate Oxidation”, *Combust Flame* **159** 1793-1805 (2012). http://dx.doi.org/10.1016/j.combustflame.2012.01.002
- S. Dooley, S-H. Won, J. Heyne, T.I. Farouk, Y. Ju, F.L. Dryer, K. Kumar, X. Hui, C-J Sung, H. Wang, M.A. Oehlschlaeger, V. Iyer, T.A. Litzinger, R.J. Santoro, T. Malewicki, and K. Brezinsky, “The Experimental Evaluation of a Methodology to Surrogate Fuel Formulation for the Emulation of Gas Phase Combustion Kinetic Phenomena by a Theory of Real Fuel Oxidation”, *Combust Flame* **159** 1444-1466 (2012). http://dx.doi.org/10.1016/j.combustflame.2011.11.002
- S. Dooley, M. Uddi, S-H. Won, W. Sun, F.L. Dryer, and Y. Ju, “The Mechanism of Methyl Butanoate Inhibition of *n*-heptane Diffusion Flames through an Evaluation of Transport and Chemical Kinetics”, *Combust. Flame* **159** 1371-1384 (2012). http://dx.doi.org/10.1016/j.combustflame.2011.09.016
- M.P. Burke, M. Chaos, Y. Ju, F.L. Dryer, and S.J. Klippenstein, ”Comprehensive H_2/O_2 Kinetic Model for High-Pressure Combustion”, *Int. J. Chem. Kin.* **44** 444-474 (2012). http://dx/doi/.org/10.1002/kin.20603
- J.K. Lefkowitz, J.S. Heyne, S-H Won, S. Dooley, H-H. Kim, F.M. Haas, S. Jahangirian, F.L. Dryer, and Y. Ju, “Chemical Kinetic Study of tertiary-Butanol in a Flow Reactor and a Counterflow Diffusion Flame” *Combust Flame* **159** *968–978* (2012). http://dx.doi.org/10.1016/j.combustflame.2011.10.004
- T. Farouk and F.L. Dryer, “Tethered Methanol Droplet Combustion in Carbon-dioxide Enriched Environment under Microgravity Conditions”, *Combust. Flame*. **159** 200–209 (2012). http://dx.doi.org/10.1016/j.combustflame.2011.06.014
- T. Farouk and F.L. Dryer, "Microgravity Droplet Combustion: Effect of Tethering Fiber on Burning Rate and Flame Structure", *Combustion Theory and Modeling* **15** 487–515 (2011). http://dx.doi.org/10.1080/13647830.2010.547601
- S.H. Won, S. Dooley, F.L. Dryer, and Y. Ju, “A Radical Index for the Determination of the Chemical Kinetic Contribution to Diffusion Flame Extinction of Large Hydrocarbon Fuels”, *Combust Flame*, **159** 541—551 (2012). http://dx.doi.org/10.1016/j.combustflame.2011.08.020
- S. Jahangirian, S. Dooley, F.M. Haas, F.L. Dryer, “A Detailed Experimental and Kinetic Modeling Study of *n*-Decane Oxidation at Elevated Pressures”, *Combust Flame*, **159** 30-43 (2012). http://dx.doi.org/10.1016/j.combustflame.2011.07.002
- W.K. Metcalfe, S. Dooley, and F.L. Dryer, “Comprehensive Detailed Chemical Kinetic Modeling Study of Toluene Oxidation”, *Energy and Fuels*, **25** 4915–4936 (2011). http://pubs.acs.org/doi/abs/10.1021/ef200900q
- F.M. Haas, A. Ramcharan, and F.L. Dryer, “Relative Reactivities of the Isomeric Butanols and Ethanol in an Ignition Quality Tester”, *Energy Fuels* **25** 3909-3916 (2011). http://pubs.acs.org/doi/abs/10.1021/ef2008024
- S. Dooley, F.L. Dryer, B. Yang, J. Wang, T.A. Cool, T. Kasper, and N. Hansen), “An Experimental and Kinetic Modeling Study of Methyl Formate Low-Pressure Flames”, *Combust Flame* **158** 732–741 (2011). http://dx.doi.org/10.1016/j.combustflame.2010.11.003

- A.J. Marchese, T.L. Vaughn, K. Kroenlein, F.L. Dryer, "Ignition Delay of Fatty Acid Methyl Ester Fuel Droplets: Microgravity Experiments and Detailed Numerical Modeling", *Proc Combust Inst* **33** 2, 2021–2030 (2011). http://dx.doi.org/10.1016/j.proci.2010.06.044.
- M.P. Burke, F.L. Dryer, and Y. Ju, "Assessment of Kinetic Modeling for Lean $H_2/CH_4/O_2$/Diluent Flames at High Pressures", *Proc Combust Inst* **33** 905–912 (2011). http://dx.doi.org/10.1016/j.proci.2010.05.021
- S.H. Won, S. Dooley, F.L. Dryer, and Y. Ju, "Kinetic Effects of Aromatic Molecular Structures on Diffusion Flame Extinction", *Proc Combust Inst* **33** 1163–1170 (2010). http://dx.doi.org/10.1016/j.proci.2010.05.082
- S. Dooley, S.H. Won, M. Chaos, J. Heyne, Y. Ju, F.L. Dryer, K. Kumar, C-J. Sung, H. Wang, M.A. Oehlschlaeger, R.J. Santoro and T.A. Litzinger, "A Jet Fuel Surrogate Formulated by Real Fuel Properties", *Combust Flame* **157** 2333–2339 (2010). http://dx.doi.org/10.1016/j.combustflame.2010.07.001
- S. Dooley, M.P. Burke, M. Chaos, Y. Stein, F.L. Dryer, V.P. Zhukov, O. Finch, J.M. Simmie, and H.J. Curran, "Methyl Formate Oxidation: Speciation Data, Laminar Burning Velocities, Ignition Delay Times and a Validated Chemical Kinetic Model", *Int J Chem Kin* **42** 527–549 (2010). http://dx.doi.org/10.1002/kin.20512 (Kinetic Model available on Dryer Combustion Lab website.)
- M.P. Burke, M. Chaos, F.L. Dryer, and Y. Ju, "Negative Pressure Dependence of Mass Burning Rates of $H_2/CO/O_2$/Diluent Flames at Low Flame Temperatures", *Combust. Flame* **157** 618–631 (2010). *Cover Article*. http://dx.doi.org/10.1016/j.combustflame.2009.08.009

Other Selected Recent Publications, Pre-prints, and Presentations

- S.F. Ahmed, A. Charchi, T.I. Farouk, and F.L. Dryer, "Effects of Pulsating Flow Field on NO and Radially-inhomogeneous NO2 Distribution in a Multidimensional Numerical Investigation of McKenna-driven Flow Tube Configuration", 11th U. S. National Combustion Meeting, Pasadena, CA, Mar 24-27, 2019. *Paper 71CK-0441*
- T.I. Farouk, S.H. Won, and F.L. Dryer, "Chemical Kinetic Preferential Vaporization Impacts on Lean Blow-Out Behaviors of Jet Fuels", 11th U. S. National Combustion Meeting, Pasadena, CA, Mar 24-27, 2019. *Paper 71IC-0326*
- F.M. Haas, F.E. Alam, J.S. Santner, F.L. Dryer, and T.I. Farouk, "Branching ratio for N2O+O → Products Determined from Flow Reactor Experiments at Intermediate Temperatures", 11th U. S. National Combustion Meeting, Pasadena, CA, Mar 24-27, 2019. *Paper 71CK-0581*
- T.I. Farouk, S.H. Won, and F.L. Dryer, "Investigating the Role of Preferential Vaporization during Submillimeter Sized Multi-component Jet Fuel Surrogate Droplet Combustion", 11th U. S. National Combustion Meeting, Pasadena, CA, Mar 24-27, 2019. *Paper 71HC-0512*
- S.F. Ahmed, F.E. Alam, T.I. Farouk, and F.L. Dryer, "Experimental Measurements and Kinetic Modeling of NOx Formation for Synthetic Natural Gas Combustion under Gas Turbine Relevant Conditions", 11th U. S. National Combustion Meeting, Pasadena, CA, Mar 24-27, 2019. *Paper 71CK-0448*
- V.R. Hasti, P.K, G.K., S.A. Drennan, S. Som, S.H. Won, F.L. Dryer, and J.P. Gore, "Lean Blow-Out (LBO) Computations in a Gas Turbine Combustor", 2018 Joint Propulsion Conference, Cincinnati, OH, July 9-11, 2018. Conference Paper AIAA 2018-4958. https://doi.org/10.2514/6.2018-4958
- S.H. Won, D. Carpenter, S. Nate, and F.L. Dryer, "Derived Cetane Number as Chemical Potential Indicator for Near-limit Combustion Behaviors in Gas Turbine Applications", 2018 ASME Power & Energy Conference and Exhibition, Orlando FL, June 24-28, 2018. Conference ASME Preprint Power Energy 2018-7414. https://doi.org/10.1115/POWER2018-7414
- D. Bell, J.S. Heyne, S.H. Won, and F.L. Dryer, "The Impact of Preferential Vaporization on Lean Blowout in a Referee Combustor at Figure of Merit Conditions", 2018 ASME Power & Energy Conference and Exhibition, Orlando FL, June 24-28, 2018. Conference ASME Preprint Power Energy 2018-7432. https://doi.org/10.1115/POWER2018-7432
- S.F. Ahmed, A. Dasguptab, F.L. Dryer, and T. I. Farouk, "Multidimensional Numerical Investigation of NOx Formation in a Burner Coupled Flow Tube Configuration", Spring Technical Meeting, Eastern States Section of the Combustion Institute, State College, PA (16801), March 4-7, 2018.
- D. Carpenter, S. Nates, S.J. Lim, F.L. Dryer, and S.H. Won, "Impact of Cyclo-Alkanes on Ignition Propensity Measured as Derived Cetane Number in Multi-Component Mixtures", Spring Technical Meeting, Eastern States Section of the Combustion Institute, State College, PA (16801), March 4- 7, 2018.

- F.E. Alam, S.F. Ahmed, F.L. Dryer and T.I. Farouk, “Kinetic Study of NOx Formation for Synthetic Natural Gas Combustion under Gas Turbine Relevant Conditions”, Spring Technical Meeting, Eastern States Section of the Combustion Institute, State College, PA (16801), March 4-7, 2018.
- “Toward Major Improvements in Efficiency and Emissions of Internal Combustion Piston Engines”, 33rd American Society for Gravitational and Space Research Conference, Hyatt Regency Lake Washington, WA, Oct. 25-28, 2017.
- "Powering Road and Air Transport Sectors with Liquid Fuels", Melbourne Energy Institute, University of Melbourne, Dec. 13, 2016. Powerpoint Presentation
- "Some Remarks on Heavy Fuel Combustion Properties", National Centre for Maritime Engineering and Hydrodynamics, University of Tasmania, Launceston, Tasmania, Dec 1, 2016. Powerpoint Presentation
- F.M. Haas, S.H. Won, and F.L. Dryer, "Detailed and Compact Combustion Kinetic Models for Iso-dodecane and Gevo Alcohol-to-Jet Alternative Fuel", 2016 Eastern States Section Spring Technical Meeting, The Combustion institute, Princeton University, NJ, Mar 13-16. Extended Abstract
- "Combustion and Emissions Properties of Heavy Fuel Oils", KAUST Fuels Workshop, Mar 5, 6, 2016. Invited Powerpoint Presentation
- F.M. Haas, S.H. Won, F.L. Dryer, and S. Dooley, "A Compact Kinetic Model for Alcohol-Derived Jet Fuel", KAUST Fuels Workshop, Mar 5, 6, 2016. Poster
- “Brief Comments on Ignition Delay Measurements - Panel Discussion on Ignition Delay Measurements for Syngas Relevant to Gas Turbine Applications", 2014 University Turbine System Research Workshop, West Lafayette, IN, Oct. 21-23, 2014. Invited Powerpoint Presentation
- T. Grunstrup, A.J. Marchese, A.P. Yalin, T. Farouk, and F.L. Dryer, “Planar Laser-induced Fluorescence Spectroscopy and Simulations of Ignition and Combustion of Freely Falling Alkane, Alcohol, and Methyl Ester Droplets”, Proceedings of the 35th International Symposium on Combustion, San Francisco, CA, Aug. 2-8, 2014. Work in Progress Poster WP3007
- A. Kazakov, M. Chaos, J. Heyne and F.L. Dryer, “Comparing Predictions and Experimental Data for Flow Reactor Studies: Computational Re-initialization”, Proceedings of the 35th International Symposium on Combustion, San Francisco, CA, Aug. 2-8, 2014. Work in Progress Poster WP3124
- F.M. Haas, A. Qin, and F.L. Dryer, ”Virtual” Smoke Point Determination of Alternative Aviation Kerosenes by Threshold Sooting Index (TSI) Methods”, 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, 28 - 30 July 2014. AIAA-2014-3468. http://dx.doi.org/10.2514/6.2014-3468
- S. Dooley, S.H. Won, F.M. Haas, J. Santner, Y. Ju, F.L. Dryer, and T. Farouk, “Development of Reduced Kinetic Models for Petroleum-Derived and Alternative Jet Fuels”, 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, 28 - 30 July 2014. AIAA-2014-3661. http://dx.doi.org/10.2514/6.2014-3661
- S.H. Won, P.S. Veloo, J. Santner, Y. Ju, S. Dooley, and F.L. Dryer, “Characterization of Global Combustion Properties with Simple Fuel Property Measurements for Alternative Jet Fuels”, 50th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, 28 - 30 July 2014. AIAA-2014-3469. http://dx.doi.org/10.2514/6.2014-3469
- K.J. Morganti, T. M. Foong, M. J. Brear, G. da Silva, Y. Yang and F. L. Dryer, “The Autoignition of Propane and n-Butane during Octane Rating: Engine Experiments and Detailed Chemical Kinetic Modelling”, Proceedings of the Australian Combustion Symposium, The University of Western Australia. Nov. 6-8, 2013. http://www.anz-combustioninstitute.org/proceedings.php
- S. Dooley, F.L. Dryer, T.I. Farouk, Y. Ju, S.H. Won, “Reduced Kinetic Models for the Combustion of Jet Propulsion Fuels”, 51st AIAA Aerospace Sciences Meeting, GrapeVine TX, 7-10 Jan. 2013. AIAA_ASM 2013-0158. http://dx.doi.org/10.2514/6.2013-158
- S.H. Won, P.S. Veloo, J. Santner, Y. Ju, and F.L. Dryer, “Comparative Evaluation of Global Combustion Properties of Alternative Jet Fuels”, 51st AIAA Aerospace Sciences Meeting, GrapeVine TX, 7-10 Jan. 2013. AIAA_ASM 2013-0156 http://dx.doi.org/10.2514/6.2013-156
- M. Chaos and F.L. Dryer, “Chemical-Kinetic Modeling of Ignition Delays: Considerations in Interpreting Shock Tube Data”, *Int J Chem Kin* **42**, 3, 143–150 (2010). http://dx.doi.org/10.1002/kin.20471
- J.L. Sabourin, D.M. Dabbs, R.A. Yetter, F.L. Dryer, and I.A. Aksay, “Functionalized Graphene Sheet Colloids for Enhanced Fuel/Propellant Combustion”, *ACS Nano*, **3**, 12, 3945–3954 (2010). *Cover Article*. http://dox.doi.org/10.1021/nn901006w

- F.M. Haas, M. Chaos, and F.L. Dryer, "Low and Intermediate Temperature Oxidation of Ethanol and Ethanol-PRF Blends: An Experimental and Modeling Study", *Combust Flame* **156** 2346–2350 (2009). http://dox.doi.org/10.1016/j.combustflame.2009.08.012
- M. Chaos, M.P. Burke, Y. Ju, and F.L. Dryer, "Syngas Chemical Kinetics and Reaction Mechanisms", Chapter 2, *Synthesis Gas Combustion: Fundamentals and Applications***,** 29–70. Eds. T.C. Lieuwen; V. Yang; and R.A. Yetter, Taylor and Francis, (2009). http://www.crcnetbase.com/doi/book/10.1201/9781420085358
- J. Wang, M. Chaos, B. Yang, T.A. Cool, F.L. Dryer, T. Kasper, N. Hansen, P. Oßwald, K. Kohse-Höinghaus and P.R. Westmoreland, "Composition of Reaction Intermediates for Stoichiometric and Fuel-rich Dimethyl Ether Flames: Flame Sampling Mass Spectrometry and Modeling Studies", *Phys Chem Chem Phys* **11**, 1328–1339 (2009). *Cover Article*. http://dox.doi.org/10.1039/b815988b
- C.K. Westbrook, W.J. Pitz, P.R. Westmoreland, F.L. Dryer, M. Chaos, Oßwald, K. Kohse-Höinghaus, T.A. Cool, J. Wang, B. Yang, N. Hansen, and T. Kasper, "A Detailed Chemical Kinetic Reaction Mechanism for Oxidation of Four Small Alkyl Esters in Laminar Premixed Flames," *Proc Combust Inst* **32,** 221–228 (2009). http://dox.doi.org/10.1016/j.proci.2008.06.106
- G. Mittal, M. Chaos, C-J. Sung, and F.L. Dryer, "Dimethyl Ether Autoignition in a Rapid Compression Machine: Experiments and Chemical Kinetic Modeling", *Fuel Proc Tech* **89,** 1244–1254 (2008). http://dox.doi.org/10.1016/j.fuproc.2008.05.021
- M. Chaos and F.L. Dryer, "Syngas Combustion Kinetics and Applications", in Special Issue: Syngas Combustion (V. Yang and T. Lieuwen, eds.), *Combust Sci Tech* **180**, 1051–1094 (2008). http://dox.doi.org/10.1080/00102200801963011
- F.L. Dryer and M. Chaos, "Ignition of Syngas/air and Hydrogen/air Mixtures at Low Temperatures and High Pressures: Experimental Data Interpretation and Kinetic Modeling Implications", *Combust Flame* **152**, 293–299 (2008). http://dox.doi.org/10.1016/j.combustflame.2007.08.005
- M. Chaos, A. Kazakov, and Z. Zhao, and F.L. Dryer "A High Temperature Chemical-Kinetic Model for Primary Reference Fuels", *Int J Chem Kin* **39**, 399–414 (2007). http://dox.doi.org/10.1002/kin.20253
- S. Gaïl, M. Thomson, S.M. Sarathy, S.A. Syed, P. Dagaut, Pascal Diévart, A.J. Marchese, and F.L. Dryer, "A Wide-Range Kinetic Modeling Study of Methyl Butanoate Combustion", *Proc Comb Ins* **31**, 1, 305–311 (2007). http://dox.doi.org/10.1016/j.proci.2006.08.051
- F.L. Dryer, M. Chaos, Z. Zhao, J.N. Stein, J.Y. Alpert, and C.J. Homer, "Spontaneous Ignition of Pressurized Releases of Hydrogen and Natural Gas into Air", *Combust Sci Tech* **179,** 663–694, (2007). http://dox.doi.org/10.1080/00102200600713583
- J. Li, Z. Zhao, A. Kazakov, and M. Chaos, F.L. Dryer, and J.J. Scire, Jr., "A Comprehensive Kinetic Mechanism for CO, CH_2O, CH_3OH Combustion", *Int J Chem Kin* **39**, 109–136 (2007). http://dox.doi.org/10.1002/kin.20218
- A. Kazakov, M. Chaos, Z. Zhao, and F.L. Dryer, "Computational Singular Perturbation Analysis of Two Stage Ignition of Large Hydrocarbons", *J Phys Chem A* **110,** 7003–7009 (2006). http://dox.doi.org/10.1021/jp057224u
- Z. Zhao, J. Li, A. Kazakov, F.L. Dryer, and S. P. Zeppieri, "Burning Velocities and a High-Temperature Skeletal Kinetic Model for n-Decane", *Combust Sci Tech* **177**, 89–106 (2005). http://dox.doi.org/10.1080/00102200590883769
- M. Chaos, Z. Zhao, A. Kazakov, P. Gokulakrishnan, M. Angioletti, and F.L. Dryer, "A PRF+Toluene Surrogate Fuel Model for Simulating Gasoline Kinetics", 5th US Combustion Meeting, University of California at San Diego, San Diego, CA, March 25–28 (2007). ***Paper E-26***.
- M.P. Burke, X. Qin, Y. Ju, and F.L. Dryer, "Measurements of Hydrogen Syngas Flame Speeds at Elevated Pressures", 5th US Combustion Meeting, University of California at San Diego, San Diego, CA, March 25–28 (2007). ***Paper A-16***.
- J. Li, A. Kazakov, M. Chaos, and F.L. Dryer, "Chemical Kinetics of Ethanol Oxidation", 5th US Combustion Meeting, University of California at San Diego, San Diego, CA, March 25–28 (2007). ***Paper C-26***.
- J.T. Farrell, N.P. Cernansky, F.L. Dryer, D.G. Friend, C.A. Hergart, C.K. Law, R.M. McDavid, C.J. Mueller, A.K. Patel, and H. Pitsch, "Development of an Experimental Database and Kinetic Models for Surrogate Diesel Fuels", *SAE paper 07PFL-676* (2007). http://dox.doi.org/10.4271/2007-01-0201

- W.J. Pitz, N.P. Cernansky, F.L. Dryer, F.N. Egolfopoulos, J.T. Farrell, D.G. Friend, H. Pitsch), "Development of an Experimental Database and Chemical Kinetic Models for Surrogate Gasoline Fuels", *SAE paper 2007-01-0175* (2007). http://dox.doi.org/10.4271/2007-01-0175
- M. Colket, T. Edwards, S. Williams, N.P. Cernansky, D.L. Miller, F. Egolfopoulos, P. Lindstedt, K. Seshadri, F.L. Dryer, C.K. Law, D. Friend, D.B. Lenhert, H. Pitsch, A. Sarofim, M. Smooke, and W. Tsang, "Development of an Experimental Database and Kinetic Models for Surrogate Jet Fuels", AIAA Annual Conference, Reno NV, January, 2007. Paper AIAA 2007-770. http://dox.doi.org/10.2514/6.2007-770
- Z. Zhao, J. Li, A. Kazakov, and F.L. Dryer, "Temperature-Dependent Feature Sensitivity Analysis for Combustion Modeling**",** *Int. J. Chem. Kin.* **37**, 282–295 (2005). http://dox.doi.org/10.1002/kin.20080
- Z. Zhao, J. Li, A. Kazakov, S.P. Zeppieri, and F.L. Dryer, "Burning Velocities of *n*-Decane a High Temperature Skeletal Kinetic Model For N-Decane-Air Mixtures", *Combust Sci Tech* **177**, 89–106 (2005). http://dox.doi.org/10.10.1080/00102200590883765
- Z. Zhao, J.P. Conley, A. Kazakov, and F.L. Dryer, "Burning Velocities of Real Gasoline Fuel at 353 K and 500 K", *SAE Transactions 2004*, SAE Paper No. 2003-01-3265. http://dox.doi.org/10.4271/2003-01-3265
- J. Li, Z. Zhao, A. Kazakov, and F.L. Dryer, "An Updated Comprehensive Kinetics Model of Hydrogen Combustion", *Int J Chem Kin* **36**, 566–575 (2004). http://dox.doi.org/10.1002/kin.20026
- J. Vican, B.F. Gajdeczko, F.L. Dryer, D.L. Milius, I.A. Aksay, and R.A. Yetter, "Development of a Microreactor as a Thermal Source for MEMS Power Generation", *Proc Combust Ins* **29**, 909–916 (2002). http://dox.doi.org/10.1016/S1540-7489(02)80115-8
- M.Y. Choi and F.L. Dryer, "Microgravity Droplet Combustion", *Microgravity Combustion, Fire in Free-Fall*, H.D. Ross, ed., Academic Press, NY, NY (2001), pp183–298. eBook ISBN: 9780080549972
- R.A. Yetter and F.L. Dryer, "Metal Particle Combustion and Classification" *Microgravity Combustion, Fire in Free-Fall*, H.D. Ross, ed., Academic Press, NY, NY (2001), pp. 419–478. eBook ISBN: 9780080549972
- J.A. Eng, W.R. Leppard, P.M. Najt, and F.L. Dryer, "The Interaction Between Nitric Oxide and Hydrocarbon Oxidation chemistry in a spark Ignition Engine", *SAE Transactions 1998*. http://dox.doi.org/10.4271/972889
- T. Amano and F.L. Dryer, "Effect of Dimethyl Ether, NO_x, and Ethane on CH_4 Oxidation: High Pressure, Intermediate Temperature Experiments and Modeling", *27th Symp (Intn'l) on Combust*, The Combustion Institute, Pittsburgh, PA (1998), pp. 397–404. http://dox.doi.org/10.1016/S0082-0784(98)80428-1
- P. Bucher, R.A. Yetter, F.L. Dryer, T.P. Parr, and D.M. Hanson-Parr, "PLIF Species and Radiometric Temperature Measurements of Aluminum Particle Combustion in O_2, CO_2, and N_2O Oxidizers, and Comparison with Model Calculations", *27th Symp (Intn'l) on Combust*, The Combustion Institute, Pittsburgh, PA (1998), pp. 2421–2429. http://dox.doi.org/10.1016/S0082-0784(98)80094-5
- T.J. Held and F.L. Dryer, "A Comprehensive Mechanism for Methanol Oxidation", *Int. J. Chem. Kin*., **30**, 805–830 (1998). http://dox.doi.org/10.1002/(SICI)1097-4601
- M.T. Allen, R.A. Yetter, and F.L. Dryer, "Hydrogen/Nitrous Oxide Kinetics - Implications of the N_xH_y Species", *Combust Flame* **112**, 302–311 (1998). http://dox.doi.org/10.1016/S0010-2180(97)00128-4
- R.A. Yetter, F.L. Dryer, H. Rabitz, R.C. Brown and C.E. Kolb, "Effect of Fluorine on the Gasification Rate of Liquid Boron Oxide Droplets", *Combust Flame* **112**, 387–403 (1998). http://dox.doi.org/10.1016/S0010-2180(97)00123-5
- R.A. Yetter, M.T. Allen, and F.L. Dryer, "Gas-Phase Reaction Mechanisms for Nitramine Combustion: On the Development of a Comprehensive Reaction Mechanism for Hydrogen/Nitrous Oxide Kinetics", in *Challenges in Propellants and Combustion – 100 Years after Nobel*, (K. Kuo, ed.) Begell House, Inc. (1997), pp. 58–69 http://dox.doi.org/10.1615/IntJEnergeticMaterialsChemProp.v4.i1-6.80
- M.T. Allen, R.A. Yetter, and F.L. Dryer, "High Pressure Studies of Moist Carbon Monoxide/Nitrous Oxide Kinetics", *Combust Flame* **109**, 449–470 (1997). http://dox.doi.org/10.1016/S0010-2180(96)00181-2
- J.F. Roesler, R.A. Yetter, and F.L. Dryer, "Inhibition and Oxidation Characteristics of Chloromethanes in Reacting $CO/H_2O/O_2$ Mixtures", *Combust Sci Tech* **120**, 11–37 (1997). http://dox.doi.org/10.1080/00102209608935567
- N.R. Purzer, R.A. Yetter, F.L. Dryer, and R.J. Lawson, "Fluidized Bed Studies of Carbon Particle Oxidation: Gas Phase Surface Products and Surface Area Evolution", *Combust Sci Tech* **110**, 147–167 (1995).

http://dox.doi.org/10.1080/00102209508951920

- D.L. Urban, S.P.C Huey, and F.L. Dryer, "Evaluation of the Coke Formation Potential of Residual Fuel Oils", *24th Sym (Int.) on Combust*, The Combustion Institute, Pittsburgh, PA, (1992), pp. 1357–1364. http://dox.doi.org/10.1016/S0082-0784(06)80158-X

Graduate Students Advised Since 1990

M. Haas, Ph.D., 2016; J. Santner, Ph.D., 2015 (co-advised with Y. Ju); J. Heyne, Ph.D., 2014; M.P. Burke, Ph.D., 2010 (co-advised with Y. Ju); K. Kroenlein, Ph.D., 2007; Z-W Zhao, Ph.D., 2005; J. Li, Ph.D., 2004; P. Ricklin, M.S.E., 2002; J. Scire, Ph.D., 2002; Z-W Zhou, M.S.E. 2002; L. Ernst, M.S.E., 2001; M. Mueller, Ph.D., 2000; S. Fischer, M.S.E., 1998;P. Bucher, Ph.D., 1998; J. Eng, Ph.D., 1998; W. Zhou, Ph.D., 1998; J. Gatto, M.S.E., 1997; D. Zarubiack, M.S.E., 1997; J.M. Fielding, M.S.E., 1997; A.J. Marchese, Ph.D., 1996; J.C.Y. Lee, Ph.D., 1996; C. Callahan, MSE, 1995; M. Allen, Ph.D., 1995; N. Ilincic, M.S.E., 1995; J. Roesler, Ph.D., 1994; T. Kim, M.S.E., 1994; T. Held, Ph.D., 1993; S. Kowalski, MSE, 1993; S. Huey, M.S.E., 1991; M.Y. Choi, Ph.D., 1991; M.L. Vermeersch, Ph.D., 1991; S. Hochgreb, Ph.D., 1991; G.T. Linteris, Ph.D., 1990; T.S. Norton, Ph.D., 1990.

Sponsored Postdoctoral Scholars

P. Vello, T. Wada, S. Jahangirian, T. Farouk, S. Dooley, W. Metcalfe, Z. Yang, H. Xu, M. Chaos, Z. Zhao, M. Angioletti, A. Kozakov, S. Zeppieri, S. Klotz, S. Gurin, K. Southerland, D. Urban, S.Y. Cho, C. Corre, F. Takahashi, I.M. Kennedy.

Thesis Degreed Graduate Students

40, and in addition, 8 co-advised with I. Glassman prior to 1981.

Patents

(with G.J. Green, and D.E. Walsh), "Droplet Generation Apparatus", European Patent No. 85302157.4-, May 20, 1985; U.S. Patent No. 4,819,831 April 11, 1989. Assigned to Mobil Oil Corporation, NY, NY.

(with S.H. Won and S. Dooley), “A Measurement Process for the Determination of the Mixture Averaged Molecular Weight of Complex Mixtures”, US Patent 0,410,876 B2, Aug 9, 2016.

(with T.I. Farouk and S.H. Won), “A Methodology and System for Reforming Liquid Fuel to Tailor Engine Combustion and Emissions Properties”, U.S. Patent Application 62/319,324, April 7, 2016.