

# Michael P. Burke

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## PROFESSIONAL EXPERIENCE

**Columbia University** New York, NY  
2014 - Present  
*Assistant Professor of Mechanical Engineering*  
*Affiliated Professor of Chemical Engineering*  
*Affiliated Member of the Data Science Institute*

**Argonne National Laboratory** Argonne, IL  
2011 - 2014  
*Director's Postdoctoral Fellow/Argonne Scholar*

**Princeton University** Princeton, NJ  
2005 - 2011  
*Research Assistant*

**The Pennsylvania State University** University Park, PA  
2004 - 2005  
*Research Assistant*

## EDUCATION AND TRAINING

**Argonne National Laboratory** Argonne, IL  
2011-2014  
*Director's Postdoctoral Fellow/Argonne Scholar*

- Sponsor: Stephen J. Klippenstein
- Chemical Sciences and Engineering Division

**Princeton University** Princeton, NJ  
2005-2011  
*Ph.D. in Mechanical and Aerospace Engineering*

- Advisors: Frederick L. Dryer and Yiguang Ju
- Major: Combustion and Energy Conversion; Minors: Fluid Mechanics and Mathematics

**The Pennsylvania State University** University Park, PA  
2001-2005  
*B.S. in Mechanical Engineering with Highest Distinction*

- Advisor: Richard A. Yetter
- Schreyer Honors College

## AWARDS AND RECOGNITIONS

- Invitee and Travel Scholarship Recipient for the International Bunsen Discussion Meeting on Chemistry and Diagnostics for Clean Combustion in Bielefeld, Germany (June 2017) – one of four assistant professors selected as “future U.S. leaders in the field”
- Doctoral New Investigator Award from the American Chemical Society Petroleum Research Fund (2016-2018)
- Three Thompson Reuters ESI Highly Cited Papers – “in the top 1% of its academic field”
- Article invited for virtual issue in International Journal of Chemical Kinetics on Special Frontiers in Chemical Kinetics of Complex Systems (2015)
- Article selected for virtual issue in Journal of Physical Chemistry A on Developments in Theoretical Chemistry (September 2013)

- Director's Postdoctoral Fellowship at Argonne National Laboratory (2011-2013) – a highly competitive award on the basis of the candidate's qualifications and an independent research proposal; eight are awarded across the laboratory each year
- Feature Article in *Combustion and Flame* (April 2010)
- Wallace Memorial Honorary Fellowship (2009-2010) – “recognizes outstanding performance and professional promise, and represents high commendation from the Princeton University Graduate School”
- Best Presentation Award in Combustion Science and Technology at the Second International Forum on Multidisciplinary Education & Research for Energy Science (December 2009)
- Princeton Energy and Climate Scholars Fellowship (2008-2010) – “assembles a select group of highly talented and engaged Princeton Ph.D. students with research expertise ranging from energy security and technology to climate science and policy”
- Distinguished Paper Award in Detonations, Explosions and Supersonic Combustion at the Thirty-first International Symposium on Combustion (August 2006)

## TEACHING EXPERIENCE

### Columbia University

New York, NY

#### Instructor

MECH E4320: Introduction to Combustion (Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018)

MECE E4302: Advanced Thermodynamics (Spring 2016, Spring 2018)

MECE E6320: Multiscale Phenomena in Gases (Spring 2018)

## UNIVERSITY SERVICE

### Columbia University

New York, NY

Department of Mechanical Engineering Graduate Committee Member (Fall 2014 – present)

Department of Mechanical Engineering Seminar Coordinator (Fall 2014 – Spring 2015)

Shared Research Computing Advisory Committee (SRCPAC) Member (Fall 2014 – present)

## PROFESSIONAL SERVICES AND ADDITIONAL EXPERIENCE

### Eastern States Section of the Combustion Institute

March 2018 - Present

#### Executive Board Member

November 2011-present

#### Reviewer

- Reviewed papers for *Progress in Energy and Combustion Science*, *Proceedings of the Combustion Institute*, *Combustion and Flame*, *Combustion Science and Technology*, *Fuel*, *Journal of Engineering for Gas Turbines and Power*, *Proceedings of the ASME Turbo Expo*, *Journal of Propulsion and Power*, *International Journal of Chemical Kinetics*, *International Journal of Quantum Chemistry*, *Journal of Physical Chemistry A*, *Journal of Physical Chemistry Letters*, and *Journal of the American Chemical Society*

December 2009-present

#### Session chair

- 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California (March 2019)
- 37<sup>th</sup> International Symposium on Combustion, Dublin, Ireland (July 2018)
- 2018 Eastern States Section Meeting of the Combustion Institute, State College, PA (March 2018)
- 10<sup>th</sup> International Conference on Chemical Kinetics, Chicago, IL (May 2017)
- 10<sup>th</sup> U.S. National Meeting of the Combustion Institute, College Park, MD (April 2017)
- 2016 Eastern States Section Meeting of the Combustion Institute, Princeton, NJ (March 2016)
- 9<sup>th</sup> U.S. National Meeting of the Combustion Institute, Cincinnati, OH (May 2015)
- 49<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Orlando, FL (January 2011)
- 2<sup>nd</sup> International Forum on Multidisciplinary Education & Research for Energy Science, Okinawa, Japan (December 2009)

### 38<sup>th</sup> International Symposium on Combustion

Adelaide, Australia

July 2020

*Colloquium Co-Chair – Gas-Phase Reaction Kinetics*

## **Cantera**

March 2019-present

*Advisory Board Member*

- Advisory Board Member for Cantera, an “open-source suite of tools for problems involving chemical kinetics, thermodynamics, and transport processes” currently used for “combustion, detonations, electrochemical energy conversion and storage, fuel cells, batteries, aqueous electrolyte solutions, plasmas, and thin film deposition.”

## **17<sup>th</sup> International Conference on Numerical Combustion**

Aachen, Germany

May 2019

*Co-organizer of mini-symposium on “New Techniques in Computational Kinetics”*

## **2019 Combustion Early Career Investigator Workshop**

Pasadena, California

March 2019

*Co-Organizer and Discussion Lead – Outreach*

- Co-Organizer and Discussion Lead at the NSF-Sponsored workshop entitled “2019 Combustion Early Career Investigator Workshop” to gather a community of early career investigators in March 2019 and form action committees to foster early career community participation

## **International Bunsen Discussion Meeting Chemistry and Diagnostics for Clean Combustion**

Bielefeld, Germany

June 2017

*Invited participant/scholarship recipient*

- Participated in discussions on strategies for future research on clean combustion

## **Workshop on “Building a Sustainable Combustion Research Community”**

College Park, MD

April 2017

*Co-founder/Co-organizer/Senior Personnel*

- Co-organizer of the NSF-Sponsored workshop entitled “Building a Sustainable Combustion Research Community” to gather 40 junior faculty in April 2017 to discuss cultural and technical topics for the future combustion community, including adopting open science practices, communicating more effectively with the general public, encouraging cross-pollination with other research fields, and incorporating numerical methods into educational content

## **Workshop on Data Science**

Cincinnati, OH

May 2015

*Invited Participant/Co-author*

- Participated in two-day workshop with Michael Frenklach, Franklin Goldsmith, Tonghun Lee, Jeff Manion, Craig Needham, Chris Shaddix, Zach Reyno-Chiasson, Phil Westmoreland, Mani Sarathy and Richard West to establish recommended directions for combustion community cyberinfrastructure
- Presented an "Uncertainty Quantification" course as part of a Data Science Tutorial for combustion researchers

## **Combustion Cyberinfrastructure Action-Plan Workshop**

Rayleigh, NC

December 2011

*Invited Participant/Co-author*

- Participated in two-day workshop with Pam Chu, Med Colket, Michael Frenklach, Bill Green, Jeff Manion, Branko Ruscic, Phil Smith, Mitch Smooke, Mani Sarathy, Wing Tsang, Charlie Westbrook, and Phil Westmoreland
- Co-authored, “An Action Plan for Transforming Combustion Research through Cyberinfrastructure,” presented to the Multi-Agency Coordination Committee for Combustion Research (MACCCR) in January 2012

## **Princeton Energy and Climate Scholars**

Princeton, NJ

Fall 2008-Spring 2010

*Founding Fellow*

- Leveraged information from monthly lunch discussions about other Fellows’ research across a diverse array of disciplines and monthly dinner conversations with faculty members and guests about exigent topics in energy and climate into a group report entitled “Energy and Climate Research: Reflections from the Princeton Energy and Climate Scholars”
- Delivered a presentation to the other Fellows on “Mechanism for the H<sub>2</sub>/O<sub>2</sub> reaction in high pressure flames and implications for syngas turbine design”

November 2009

Participant/Presenter

- Participated in the Second Princeton-China Forum on Energy, Environment and Economic Policy Research

## PEER-REVIEWED JOURNAL AND BOOK PUBLICATIONS

25. L. Lei, M.P. Burke, “Bath Gas Mixture Effects on Multi-Channel Reactions: Insights and Representations for Systems beyond Single-Channel Reactions,” *Journal of Physical Chemistry A* 123 (2019) 631-649.
24. L. Lei, M.P. Burke, “Evaluating Mixture Rules and Combustion Implications for Multi-Component Pressure Dependence of Allyl + HO<sub>2</sub> Reactions,” *Proceedings of the Combustion Institute* 37 (2019) 355-362.
23. M.C. Barbet, K. McCullough, M.P. Burke, “A Framework for Automatic Discovery of Chemically Termolecular Reactions,” *Proceedings of the Combustion Institute* 37 (2019) 347-354.
22. M.P. Burke, S.J. Klippenstein, “Ephemeral Collision Complexes Mediate Chemically Termolecular Transformations that Affect System Chemistry,” *Nature Chemistry* 9 (2017) 1078–1082.
21. M.P. Burke, R. Song, “Evaluating Mixture Rules for Multi-Component Pressure Dependence: H + O<sub>2</sub> (+M) = HO<sub>2</sub> (+M),” *Proceedings of the Combustion Institute* 36 (2017) 245–253.
20. J.A. Miller, S.J. Klippenstein, S.H. Robertson, M.J. Pilling, R. Shannon, J. Zádor, A.W. Jasper, C.F. Goldsmith, M.P. Burke, “Comment on ‘When Rate Constants Are Not Enough’ by John R. Barker, Michael Frenklach, and David M. Golden,” *Journal of Physical Chemistry A* 120 (2016) 306–312.
19. M.P. Burke, “Harnessing the Combined Power of Theoretical and Experimental Data through Multi-Scale Informatics,” *International Journal of Chemical Kinetics* 48 (2016) 212–235. †
18. S.S. Merchant, C.F. Goldsmith, A.G. Vandeputte, M.P. Burke, S.J. Klippenstein, W.H. Green, “Understanding low-temperature first-stage ignition delay: Propane,” *Combustion and Flame* 162 (2015) 3658–3673.
17. M.P. Burke, C.F. Goldsmith, S.J. Klippenstein, O. Welz, H. Huang, I.O. Antonov, J.D. Savee, D.L. Osborn, J. Zádor, C.A. Taatjes, L. Sheps, “Multi-Scale Informatics for Low-Temperature Propane Oxidation: Further Complexities in Studies of Complex Reactions,” *Journal of Physical Chemistry A* 119 (2015) 7095–7115. †
16. O. Welz, M.P. Burke, I.O. Antonov, C.F. Goldsmith, J.D. Savee, D.L. Osborn, C.A. Taatjes, S.J. Klippenstein, L. Sheps, “New Insights into Low-Temperature Oxidation of Propane from Synchrotron Photoionization Mass Spectrometry and Multi-Scale Informatics Modeling,” *Journal of Physical Chemistry A* 119 (2015) 7116–7129. †
15. M.P. Burke, C.F. Goldsmith, Y. Georgievskii, S.J. Klippenstein, “Towards a Quantitative Understanding of the Role of Non-Boltzmann Reactant Distributions in Low-Temperature Oxidation,” *Proceedings of the Combustion Institute* 35 (2015) 205-213.
14. C.F. Goldsmith, M.P. Burke, Y. Georgievskii, S.J. Klippenstein, “Effect of Non-Thermal Product Energy Distributions on Ketohydroperoxide Decomposition Kinetics,” *Proceedings of the Combustion Institute* 35 (2015) 283-290.
13. Y. Georgievskii, J.A. Miller, M.P. Burke, S.J. Klippenstein, “Reformulation and Solution of the Master Equation for Multiple-Well Chemical Reactions,” *Journal of Physical Chemistry A* 117 (2013) 12146-12154. §
12. M.P. Burke, S.J. Klippenstein, L.B. Harding, “A Quantitative Explanation for the Apparent Anomalous Temperature Dependence of OH + HO<sub>2</sub> = H<sub>2</sub>O + O<sub>2</sub> through Multi-Scale Modeling,” *Proceedings of the Combustion Institute* 34 (2013) 547-555.
11. M.P. Burke, M. Chaos, Y. Ju, F.L. Dryer, S.J. Klippenstein, “Comprehensive H<sub>2</sub>/O<sub>2</sub> Kinetic Model for High-Pressure Combustion,” *International Journal of Chemical Kinetics* 44 (2012) 444-474.
10. M.P. Burke, F.L. Dryer, Y. Ju, “Assessment of kinetic modeling for lean H<sub>2</sub>/CH<sub>4</sub>/O<sub>2</sub>/diluent flames at high pressures,” *Proceedings of the Combustion Institute* 33 (2011) 905-912.
9. Z. Chen, M.P. Burke, Y. Ju, “On the critical flame radius and minimum ignition energy for spherical flame initiation,” *Proceedings of the Combustion Institute* 33 (2011) 1253-1260.
8. Y. Ju, W. Sun, M.P. Burke, X. Gou, Z. Chen, “Multi-timescale modeling of ignition and flame regimes of n-heptane-air mixtures near spark assisted homogeneous charge compression ignition conditions,” *Proceedings of the Combustion Institute* 33 (2011) 1245-1251.
7. S. Dooley, M.P. Burke, M. Chaos, Y. Stein, F.L. Dryer, C.A. Daly, 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,” *International Journal of Chemical Kinetics* 42 (2010) 527-549.
6. M.P. Burke, M. Chaos, F.L. Dryer, Y. Ju, “Negative pressure dependence of mass burning rates of H<sub>2</sub>/CO/O<sub>2</sub>/diluent flames at low flame temperatures,” *Combustion and Flame* 157 (2010) 618–631. †
5. M. Chaos, M.P. Burke, Y. Ju, F.L. Dryer, “Syngas chemical kinetics and reaction mechanisms,” *Synthesis Gas Combustion: Fundamentals and Applications*. Ed. T.C. Lieuwen, V. Yang, R.A. Yetter. Taylor & Francis (2009), p. 29-70.
4. M.P. Burke, Z. Chen, Y. Ju, F.L. Dryer, “Effect of cylindrical confinement on the determination of laminar flame speeds using outwardly propagating flames,” *Combustion and Flame* 156 (2009) 771-779.

3. Z. Chen, M.P. Burke, Y. Ju, “Effects of compression and stretch on the determination of laminar flame speed using propagating spherical flames,” *Combustion Theory and Modelling* 13 (2009) 343-364.
2. Z. Chen, M.P. Burke, Y. Ju, “Effects of Lewis number and ignition energy on the determination of laminar flame speed using propagating spherical flames,” *Proceedings of the Combustion Institute* 32 (2009) 1461-1469.
1. M.-H. Wu, M.P. Burke, S.F. Son, R.A. Yetter, “Flame acceleration and the transition to detonation of stoichiometric ethylene/oxygen in microscale tubes,” *Proceedings of the Combustion Institute* 31 (2007) 2429–2436. ‡

† Article invited for virtual issue on “Scientific Frontiers in Chemical Kinetics for Complex Systems”

‡ Articles invited for special issue for “100 Years of Combustion Kinetics at Argonne: A Festschrift for Lawrence B. Harding, Joe V. Michael, and Albert F. Wagner”

§ Article selected for virtual issue on “Developments in Theoretical Chemistry”

† Feature Article

‡ Distinguished Paper Award in “Detonations, Explosions and Supersonic Combustion”

## INVITED LECTURES

18. M.P. Burke, “Pressure-Dependent Kinetics in Reactive Mixtures,” 2019 AFOSR/ARO/NSF Basic Combustion Research Review, Arlington, Virginia, June 2019.
17. M.P. Burke, “Chemical Kinetic Data of Benchmark Accuracy through Multi-Scale Informatics Strategies,” 39<sup>th</sup> Annual Gas Phase Chemical Physics PI Meeting, Gaithersburg, Maryland, May 2019.
16. M.P. Burke, “Towards Autonomous Kinetic Model Development: Automated Data Selection, Generation, and Integration,” 17<sup>th</sup> International Conference on Numerical Combustion, Aachen, Germany, May 2019 (invited for Mini-Symposium on “High Performance Computing, towards high throughput kinetics and combustion model development”).
15. M.P. Burke, “Complex Reactions across Scales: Non-Equilibrium Kinetics in Mixtures and Uncertainty Quantification,” International Workshop on Gas-phase Kinetics in Interstellar, Atmospheric, and Combustion Chemistry, Hefei, China, March 2019.
14. M.P. Burke, “Multi-Component, Reactive Pressure-Dependent Chemistry,” 11<sup>th</sup> Review Meeting of the Multi-Agency Coordinating Committee for Combustion Research (MACCCR), Livermore, California, April 2018.
13. M.P. Burke, “Use of Uncertainty Quantification in Tools for Autonomous Scientific Inquiry,” 16<sup>th</sup> International Conference on Numerical Combustion, Orlando, Florida, April 2017 (invited for Mini-Symposium on Uncertainty Quantification in Computational Combustion).
12. M.P. Burke, “Science across Scales: Informatics Strategies and Non-Equilibrium Phenomena,” Laboratoire Réactions et Génie des Procédés, Université de Lorraine, CNRS, ENSIC, Nancy, France, April 2015.
11. M.P. Burke, “Combining Theoretical and Experimental Data in Uncertainty Quantification across Multiple Scales,” 15<sup>th</sup> International Conference on Numerical Combustion, Avignon, France, April 2015 (invited for Mini-Symposium on Uncertainty Quantification in Computational Combustion).
10. M.P. Burke, “Multi-Scale Informatics for Low-Temperature Oxidation,” 2<sup>nd</sup> International Workshop on Flame Chemistry, San Francisco, California, July 2014.
9. M.P. Burke, “Multi-Scale Informatics: “Connecting the Dots” in Complex Reaction Modeling from electrons to energy devices...and back!” Mechanical Engineering Department Seminar, Columbia University, April 2013.
8. M.P. Burke, “Multi-Scale Informatics: “Connecting the Dots” in Complex Reaction Modeling from electrons to engines...and back!” Institute for Systems Research Seminar, University of Maryland, March 2013.
7. M.P. Burke, “Multi-Scale Informatics for High-Accuracy Modeling of Complex Reaction Systems: from electrons to energy devices and back,” Mechanical Engineering Department Seminar, University of Illinois at Chicago, February 2013.
6. M.P. Burke, “Multi-Scale Informatics for High-Accuracy Modeling of Complex Reaction Systems: from electrons to engines and back,” Mechanical Engineering Department Seminar, Temple University, January 2013.
5. M.P. Burke, “Multi-scale Informatics: High-Accuracy Modeling from Electrons to Engines,” Aerospace Engineering Department Seminar, Georgia Institute of Technology, October 2012.
4. M.P. Burke (with F.L. Dryer), “High Pressure Kinetic Mechanisms for Hydrogen and Hydrogen Syngas,” 1<sup>st</sup> International Workshop on Flame Chemistry, Warsaw, Poland, July 2012.
3. M.P. Burke, “H<sub>2</sub>/O<sub>2</sub> Mechanism in High-Pressure Flames and a Proposed Informatics Approach to Modeling,” Chemical Sciences and Engineering Division, Argonne National Laboratory, September 2010.
2. M.P. Burke, “Developing chemical models for synthetic gas combustion in clean coal technologies,” BP Clean Energy Research and Education Centre, Tsinghua University, Beijing, China, November 2009.
1. M.P. Burke, “Developing chemical models for synthetic gas combustion in clean coal technologies,” The Center for Environmental Policy Research, Beijing Institute of Technology, Beijing, China, November 2009.

## CONFERENCE PAPERS AND PRESENTATIONS

56. L. Lei, M.P. Burke, “New Mixture Rules for Pressure-Dependent Reactions for Implementation in Combustion Codes,” 17<sup>th</sup> International Conference on Numerical Combustion, Aachen, Germany, May 2019.
55. M.P. Burke, L. Lei, “The Role of Mixture Rules in Experimental Interpretations of Third-Body Efficiencies,” 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California, March 2019.
54. C.E. LaGrotta, M.C. Barbet, L. Lei, M.P. Burke, “Towards a High-Accuracy Kinetic Database Informed by Theoretical and Experimental Data,” 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California, March 2019.
53. L. Lei, M.P. Burke, “Reaction Kinetics of Chemically Termolecular Reactions: Pressure Dependence,” 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California, March 2019.
52. L. Lei, M.P. Burke, “Dynamic Evaluation of Multi-Component Pressure Dependence in Multi-Channel Reactions: CH<sub>3</sub> + OH as a Case Study,” 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California, March 2019.
51. M.C. Barbet, M.P. Burke, “Screening for Structural Uncertainties from Third-body Collision Efficiencies,” 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California, March 2019.
50. R.E. Cornell, C.E. LaGrotta, M.C. Barbet, M.P. Burke, “Influence of Chemically Termolecular Reactions on Species Concentrations during RDX Combustion,” 11<sup>th</sup> U.S. Meeting of the Combustion Institute, Pasadena, California, March 2019.
49. M.C. Barbet, K. McCullough, M.P. Burke, “A Framework for Automatic Discovery of Chemically Termolecular Reactions,” 37<sup>th</sup> International Symposium on Combustion, Dublin, Ireland, July 2018.
48. M.P. Burke, “Pressure Dependence of Chemically Termolecular Reactions,” 25<sup>th</sup> International Symposium on Gas Kinetics, Lille, France, July 2018.
47. M.P. Burke, “Multi-Component Reactive Pressure Dependence,” 4<sup>th</sup> International Workshop on Flame Chemistry, Dublin, Ireland, July 2018.
46. C.E. LaGrotta, M.C. Barbet, L. Lei, M.P. Burke, “Multiscale Informatics of Reactions involved in H<sub>2</sub>O<sub>2</sub> Decomposition in the Presence of Dopants,” 2018 Technical Meeting of the Eastern States Section of the Combustion Institute, State College, Pennsylvania, March 2018.
45. R.E. Cornell, C.E. LaGrotta, M.C. Barbet, M.P. Burke, “Impact of Chemically Termolecular Reactions on the Kinetics of Energetic Materials,” 2018 Technical Meeting of the Eastern States Section of the Combustion Institute, State College, Pennsylvania, March 2018.
44. L. Lei, M.P. Burke, “Dynamic Evaluation of Multi-Component Pressure Dependence in Multi-Channel Reactions: A Case Study of CH<sub>3</sub> + OH System,” 2018 Technical Meeting of the Eastern States Section of the Combustion Institute, State College, Pennsylvania, March 2018.
43. M.C. Barbet, K. McCullough, M.P. Burke, “High-Throughput Screening for Reactive and Energy-Transferring Collider Effects in Complex-Forming Reactions,” 2018 Technical Meeting of the Eastern States Section of the Combustion Institute, State College, Pennsylvania, March 2018.
42. F.M. Haas, C.F. Goldsmith, M.P. Burke, B.W. Weber, K.E. Neimeyer, “ChemKED for profile-resolved data: A discussion of some salient data standard features,” 2018 Technical Meeting of the Eastern States Section of the Combustion Institute, State College, Pennsylvania, March 2018.
41. L. Lei, M.P. Burke, “Exploring Representations of Multi-Component Pressure Dependence of Complex-Forming Reactions in Mixtures,” 10<sup>th</sup> International Conference on Chemical Kinetics, Chicago, Illinois, May 2017.
40. M. Barbet, K. McCullough, M.P. Burke, “Automated Discovery of Non-Boltzmann Bimolecular Pathways in NO<sub>x</sub> Formation,” 10<sup>th</sup> U.S. Meeting of the Combustion Institute, College Park, Maryland, April 2017.
39. L. Lei, M.P. Burke, “Evaluating Multi-Component Pressure Dependence of Mixture Rules for Multi-Well Multi-Channel Reacting Systems,” 10<sup>th</sup> U.S. Meeting of the Combustion Institute, College Park, Maryland, April 2017.
38. L. Lei, M.P. Burke, “Evaluating Multi-Component Pressure Dependence of Mixture Rules for Multi-Channel Complex Reactions,” 35<sup>th</sup> Kinetics and Dynamics Meeting, Newark, New Jersey, January 2017.
37. M.P. Burke, R. Song, “Evaluating Mixture Rules for Multi-Component Pressure Dependence: H + O<sub>2</sub> (+M) = HO<sub>2</sub> (+M),” 36<sup>th</sup> International Symposium on Combustion, Seoul, Korea, August 2016.
36. M.P. Burke, “Surprising Energy Transfer Effects in Multi-Channel Complex Reactions in Multi-Component Baths,” 24<sup>th</sup> International Symposium on Gas Kinetics and Related Phenomena, York, United Kingdom, July 2016.
35. R. Song, N.D. DeLuca, M.P. Burke, “Towards Autonomous Kinetic Model Improvement through Automated Experiments and Computations,” Eastern States Meeting of the Combustion Institute, Princeton, New Jersey, March 2016.
34. K. McCullough, M.P. Burke, “Automated Discovery of Non-Boltzmann Bimolecular Reaction Pathways,” Eastern States Meeting of the Combustion Institute, Princeton, New Jersey, March 2016.
33. M. Verdicchio, A.W. Jasper, K.M. Pelzer, Y. Georgievskii, M.P. Burke, J.A. Miller, S.J. Klippenstein. “Predicting the pressure-dependent kinetics of radical-radical reactions: A priori solution of the two-dimensional master equation.” 33<sup>rd</sup> International Symposium on Free Radicals, Olympic Valley, California, August 2015.
32. M.P. Burke, “Collisional Energy Transfer during Complex Reactions in Multi-Component Mixtures,” 9<sup>th</sup> International Conference on Chemical Kinetics, Ghent, Belgium, July 2015.

31. M.P. Burke, "The Role of Model Structural Uncertainties in Uncertainty Quantification and Experimental Design," 9<sup>th</sup> U.S. Meeting of the Combustion Institute, Cincinnati, Ohio, May 2015.
30. M.P. Burke, C.F. Goldsmith, Y. Georgievskii, S.J. Klippenstein, "Towards a Quantitative Understanding of the Role of Non-Boltzmann Reactant Distributions in Low-Temperature Oxidation," 35<sup>th</sup> International Symposium on Combustion, San Francisco, California, August 2014.
29. C.F. Goldsmith, M.P. Burke, Y. Georgievskii, S.J. Klippenstein, "Effect of Non-Thermal Product Energy Distributions on Ketohydroperoxide Decomposition Kinetics," 35<sup>th</sup> International Symposium on Combustion, San Francisco, California, August 2014.
28. M.P. Burke, C.F. Goldsmith, Y. Georgievskii, S.J. Klippenstein, "Non-Boltzmann Effects in Low-Temperature Fuel Oxidation," Eastern States Meeting of the Combustion Institute, Clemson, South Carolina, October 2013.
27. M.P. Burke, C.F. Goldsmith, S.J. Klippenstein, L. Sheps, O. Welz, J. Zádor, H. Huang, C.A. Taatjes, "Multi-Scale Informatics for Low-Temperature Propane Oxidation," 8<sup>th</sup> U.S. Meeting of the Combustion Institute, Park City, Utah May 2013.
26. M.P. Burke, S.J. Klippenstein, L.B. Harding, "A Quantitative Explanation for the Apparent Anomalous Temperature Dependence of  $\text{OH} + \text{HO}_2 = \text{H}_2\text{O} + \text{O}_2$  through Multi-Scale Modeling," 34<sup>th</sup> International Symposium on Combustion, Warsaw, Poland, August 2012.
25. M.P. Burke, S.J. Klippenstein, L.B. Harding, "Multi-Scale Modeling: Full Consistency from Quantum Chemistry to Combustion," 2011 ANL Postdoctoral Research Symposium, Argonne National Laboratory, Argonne, Illinois, October 2011.
24. M.P. Burke, S.J. Klippenstein, L.B. Harding, "A Multi-Scale Approach to Model Development: Unraveling the  $\text{H}_2\text{O}_2$  Decomposition System," Eastern States Meeting of the Combustion Institute, Storrs, Connecticut, October 2011.
23. F.M. Haas, T. Farouk, M. Chaos, M.P. Burke, F.L. Dryer, "Rate Coefficients for  $\text{H} + \text{O}_2 + \text{CO}_2 = \text{HO}_2 + \text{CO}_2$  Determined in a New High Pressure Laminar Flow Reactor," Eastern States Meeting of the Combustion Institute, Storrs, Connecticut, October 2011.
22. M.P. Burke, M. Chaos, Y. Ju, F.L. Dryer, S.J. Klippenstein, "Comprehensive  $\text{H}_2/\text{O}_2$  Kinetic Model with Assessment of Commonly Neglected Processes," 7<sup>th</sup> U.S. Meeting of the Combustion Institute, Atlanta, Georgia, March 2011.
21. J. Santner, M.P. Burke, Y. Ju, F.L. Dryer, "High Pressure Burning Rates and Kinetic Assessment of Mechanisms Using High Hydrogen Content  $\text{CO}$ ,  $\text{CH}_4$ ,  $\text{C}_2\text{H}_4$ , and  $\text{C}_2\text{H}_6$  Flames," 7<sup>th</sup> U.S. Meeting of the Combustion Institute, Atlanta, Georgia, March 2011.
20. M.P. Burke, M. Chaos, Y. Ju, F.L. Dryer, S.J. Klippenstein, "Kinetic modeling of the  $\text{H}_2/\text{O}_2$  reaction in high-pressure flames," 49<sup>th</sup> AIAA Aerospace Sciences Meeting and Exhibit, Orlando, Florida, January 2011.
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‡ Best Presentation Award in Combustion Science and Technology