Bryan W. Weber

CONTACT INFORMATION

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EDUCATION

Ph.D., Mechanical Engineering, University of Connecticut, 2014
M.S., Mechanical Engineering, University of Connecticut, 2010
B.S.E., Aerospace Engineering, Case Western Reserve University, 2009

PROFESSIONAL EXPERIENCE

Assistant Professor in Residence, *University of Connecticut* 2016–Present
Visiting Assistant Professor, *University of Connecticut* 2014–2016

- Conducting research on the combustion kinetics of alternative and traditional fuels
- Developing tools to improve reproducibility in experimental works
- Teaching undergraduate courses in thermal-fluids engineering
- Mentoring undergraduate students in the capstone design project

Lead Developer, *UConnRCMPy* 2015–Present

- Developing an open-source data analysis package for rapid compression machine experiments to encourage and improve reproducibility in experimental works
- Collaborating with other researchers to improve and extend the package
- Code is available on GitHub: https://github.com/bryanwweber/UConnRCMPy

Co-Lead Developer, *PyKED* 2016–Present

- Implemented a Python interface to the ChemKED database format for chemical kinetics experiments
- Collaborating with other researchers to define the database format, project governance, and community standards
- Code is available on GitHub: https://github.com/pr-omethe-us/PyKED

Contributing Developer, *Cantera* 2013–Present

- Contributing source code to the open-source software toolkit for chemical kinetics, thermodynamics, and transport processes
- Assisting users with usage of Cantera in the online support group
- Code is available on GitHub: https://github.com/Cantera/cantera

Graduate Research Assistant, *University of Connecticut* 2009–2014
Undergraduate Research Assistant, *Case Western Reserve University* 2007–2009
Combustion Diagnostics Laboratory — Director: C.J. Sung

- Conducted experimental and computational studies of the ignition properties of several alternative fuels and foundational fuels, with a focus on engine-relevant conditions.

- Designed a species sampling apparatus for time-resolved species measurements in the rapid compression machine, using gas chromatography/mass spectrometry to identify and quantify combustion intermediates.
- Analyzed kinetic models of combustion to determine the parameters controlling prediction of ignition delay and to improve the ability of the models to predict combustion events.

Journal Publications

[9] E.E. Dames, A.S. Rosen, **B.W. Weber**, C.W. Gao, C.J. Sung, and W.H. Green. *A Detailed Combined Experimental and Theoretical Study on Dimethyl Ether/Propane Blended Oxidation.* Combustion and Flame, vol. 168, pp. 310–330, Jun. 2016.
doi:10.1016/j.combustflame.2016.02.021

[8] G. Kukkadapu, **B.W. Weber**, and C.J. Sung. *Autoignition study of tetralin in a rapid compression machine at elevated pressures and low-to-intermediate temperatures.* Fuel, vol. 159, pp. 436–445, Nov. 2015.
doi:10.1016/j.fuel.2015.06.093

[7] **B.W. Weber**, C.J. Sung, and M.W. Renfro. *On the Uncertainty of Temperature Estimation in a Rapid Compression Machine.* Combustion and Flame, vol. 162, no. 6, pp. 2518–2528, Jun. 2015.
doi:10.1016/j.combustflame.2015.03.001

[6] 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. Nilsson, A.A. Konnov, M. Alrefae, F. Khaled, A. Farooq, P. Dirrenberger, P.A. Glaude, F. Battin-Leclerc, and H.J. Curran. *An Experimental and Modeling Study of Propene Oxidation. Part 2: Ignition Delay Time and Flame Speed Measurements.* Combustion and Flame, vol. 162, no. 2, pp. 296–314, Feb. 2015.
doi:10.1016/j.combustflame.2014.07.032

[5] **B.W. Weber**, W.J. Pitz, M. Mehl, A.C. Davis, E.J. Silke, and C.J. Sung. *Experiments and Modeling of the Autoignition of Methylcyclohexane at High Pressure.* Combustion and Flame, vol. 161, no. 8, pp. 1972–1983, Aug. 2014.
doi:10.1016/j.combustflame.2014.01.018

[4] S.M. Sarathy, S. Park, **B.W. Weber**, W. Wang, P.S. Veloo, A.C. Davis, C. Togbé, C.K. Westbrook, O. Park, G. Dayma, Z. Luo, M.A. Oehlschlaeger, F.N. Egolfopoulos, T. Lu, W.J. Pitz, C.J. Sung, and P. Dagaut. *A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion.* Combustion and Flame, vol. 160, no. 12, pp. 2712–2728, Dec. 2013.
doi:10.1016/j.combustflame.2013.06.022

[3] **B.W. Weber** and C.J. Sung. *Comparative Autoignition Trends in Butanol Isomers at Elevated Pressure.* Energy and Fuels, vol. 27, no. 3, pp. 1688–1698, Mar. 2013.

doi:10.1021/ef302195c

[2] T. Tsujimura, W.J. Pitz, F. Gillespie, H.J. Curran, **B.W. Weber**, Y. Zhang, and C.J. Sung. *Development of Isopentanol Reaction Mechanism Reproducing Autoignition Character at High and Low Temperatures.* Energy and Fuels, vol. 26, no. 8, pp. 4871–4886, Aug. 2012.
doi:10.1021/ef300879k

[1] **B.W. Weber**, K. Kumar, Y. Zhang, and C.J. Sung. *Autoignition of n-butanol at elevated pressure and low-to-intermediate temperature.* Combustion and Flame, vol. 158, no. 5, pp. 809–819, Mar. 2011.
doi:10.1016/j.combustflame.2011.02.005
arxiv:1706.00867

Conference Publications and Presentations

[16] **B.W. Weber** (Presenting) and C.J. Sung. *UConnRCMPy: Python-based data analysis for Rapid Compression Machines.* Paper 2D19, 10th US National Technical Meeting of the Combustion Institute, College Park, MD, Apr. 2017.
arxiv:1706.01984
figshare:10.6084/m9.figshare.5089597

[15] **B.W. Weber** (Presenting) and K.E. Niemeyer. *ChemKED: a human- and machine-readable data standard for chemical kinetics experiments.* Paper 1D11, 10th US National Technical Meeting of the Combustion Institute, College Park, MD, Apr. 2017.
arxiv:1706.01987v1
figshare:10.6084/m9.figshare.5082709

[14] **B.W. Weber** (Presenting), J. Bunnell, K. Kumar, and C.J. Sung. *Autoignition of Methyl Valerate at Low to Intermediate Temperatures and Elevated Pressures in a Rapid Compression Machine.* Paper 2D01, 10th US National Technical Meeting of the Combustion Institute, College Park, MD, Apr. 2017.
arxiv:1706.01483
figshare:10.6084/m9.figshare.5089594

[13] H. Wang, **B.W. Weber**, R. Fang (Presenting), and C.J. Sung. *High-Pressure Autoignition of Binary Blends of Methanol and Dimethyl Ether.* Paper 3D01, 10th US National Technical Meeting of the Combustion Institute, College Park, MD, Apr. 2017.
arxiv:1706.01485

[12] **B.W. Weber** (Presenting) and C.J. Sung. *UConnRCMPy: Python-based data analysis for Rapid Compression Machines.* 15th Python in Science Conference, Austin, TX, Jul. 2016.
figshare:10.6084/m9.figshare.5089573
http://conference.scipy.org/proceedings/scipy2016/bryan_weber.html

[11] G. Kukkadapu (Presenting), **B.W. Weber**, and C.J. Sung. *Autoignition study of tetralin in a rapid compression machines at elevated pressures and low-to-intermediate temperatures.* Paper 1G05, 9th US National Technical Meeting of the Combustion Institute, Cincinnati, OH, May 2015.

[10] K. Kumar (Presenting), J. Bunnell, **B.W. Weber**, and C.J. Sung. *Autoignition of methyl-propanoate and a comparison with its selected ester homologs.* Paper 1G07, 9th US National Technical Meeting of the Combustion Institute, Cincinnati, OH, May 2015.

[9] E.E. Dames (Presenting), **B.W. Weber**, A. Rosen, C.W. Gao, C.J. Sung, and W.H. Green. *Towards a comprehensive DME/propane blended combustion kinetic model.* Paper 2F16, 9th US National Technical Meeting of the Combustion Institute, Cincinnati, OH, May 2015.

[8] S.S. Merchant (Presenting), W.H. Green, K.M. Van Geem, N. Hansen, **B.W. Weber**, and C.J. Sung. *Combustion of the Butanol Isomers: Reaction Pathways from High to Low Temperature.* 8th International Conference on Chemical Kinetics, University Seville, Seville, Spain, Jul. 2013.

[7] **B.W. Weber** (Presenting), W.J. Pitz, C.J. Sung, M. Mehl, E.J. Silke, and A.C. Davis. *Experiments and Modeling of the Autoignition of Methyl-Cyclohexane at High Pressure.* Paper 3A02, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.
arxiv:1706.01828
figshare:10.6084/m9.figshare.5089564

[6] **B.W. Weber** (Presenting), S.S. Merchant, C.J. Sung, and W.H. Green. *An Autoignition Study of iso-Butanol: Experiments and Modeling.* Paper 3A01, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.
arxiv:1706.01827
figshare:10.6084/m9.figshare.5089555

[5] S.M. Sarathy, S. Park, W. Wang, P. Veloo, A.C. Davis, C. Togbé, **B.W. Weber** (Presenting), C.K. Westbrook, O. Park, G. Dayma, Z. Luo, M.A. Oehlschlaeger, F. Egolfopoulos, T. Lu, W.J. Pitz, C.J. Sung, and P. Dagaut. *A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion.* Paper 2A12, 8th US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.

[4] **B.W. Weber** (Presenting) and C.J. Sung. *Comparative Investigation of the High Pressure Autoignition of the Butanol Isomers.* Paper A-01, Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT, Oct. 2011.
arxiv:1706.01842
figshare:10.6084/m9.figshare.5089540

[3] M.R. Harper, W.H. Green (Presenting), K.M. Van Geem, **B.W. Weber**, C.J. Sung, I. Stranic, D.F. Davidson, and R.K. Hanson. *Combustion of the butanol isomers: Reaction pathways at elevated pressures from low-to-high temperatures.* Paper #84, 7th International Conference on Chemical Kinetics, Cambridge, MA, Jul. 2011.

[2] **B.W. Weber** (Presenting) and C.J. Sung. *A Rapid Compression Study of the Butanol Isomers at Elevated Pressure.* Paper 1B13, 7th US National Technical Meeting of the Combustion Institute, Atlanta, GA, Mar. 2011.
arxiv:1706.01832
figshare:10.6084/m9.figshare.5089519

[1] **B.W. Weber** (Presenting), K. Kumar, and C.J. Sung. *Autoignition of Butanol Isomers at Low to Intermediate Temperature and Elevated Pressure.* Paper AIAA-2011-0316, 49th Annual Aerospace Sciences Meeting, Orlando, FL, Jan. 2011.
arxiv:1706.01837
figshare:10.6084/m9.figshare.5089537

Conference Posters

[3] **B.W. Weber** and C.J. Sung. *Validation of Kinetic Models of the Butanol Isomers At High Pressure using a Rapid Compression Machine.* Poster T40, 7th International Conference on Chemical Kinetics, Cambridge, MA, Jul. 2011.
figshare:10.6084/m9.figshare.5089456

[2] **B.W. Weber**. *Autoignition of n-Butanol at Elevated Pressure and Low to Intermediate Temperature.* 1st Combustion Energy Frontier Research Center Annual Meeting, Princeton University, Princeton, NJ, Sep. 2010.
figshare:10.6084/m9.figshare.5084803

[1] **B.W. Weber**, K. Kumar, and C.J. Sung. *An Investigation of Hydrocarbon Flames using Probe Sampling and Gas Chromatography/Mass Spectrometry.* Support of Undergraduate Research and Creative Endeavors Symposium and Poster Session, Case Western Reserve University, Cleveland, OH, Apr. 2009.
figshare:10.6084/m9.figshare.5084797

Other Presentations

[1] **B.W. Weber** and C.J. Sung. *Analysis of Hydrocarbon Fuels using Gas Chromatography/Mass Spectrometry.* Summer Undergraduate Research in Energy Sciences Program, Dominion Energy East Ohio Branch, Cleveland, OH, Aug. 2008.

Grants, Awards, and Fellowships

2017-01-01–2017-05-31	—	"Measurement of Chemical Pathways During Autoignition at High Pressure" NASA Connecticut Space Grant Consortium Funding: $20,000, PI
2014-01-21–2014-05-02	—	"High Pressure Ignition Chemistry of Alternative Fuels" University of Connecticut Doctoral Dissertation Fellowship Funding: $2,000
2013-04-01–2013-05-01	—	"Experiments and Detailed Modeling of Butanol Ignition" Department of Mechanical Engineering Graduate Predoctoral Fellowship Funding: $2,000
2013-01-22–2013-05-03	—	Graduate Teaching Fellowship Department of Mechanical Engineering University of Connecticut
2010-01-06–2010-05-22	—	"Assessing the Feasibility of Substituting Biofuels for Conventional Hydrocarbon Fuels" University of Connecticut GAANN Fellowship in Sustainable Energy Technologies Funding: $7,599
2019-05-16	—	Fred H. Vose Prize Department of Mechanical and Aerospace Engineering Case Western Reserve University
2008-06-01–2008-08-31	—	"Investigation of Hydrocarbon Flame Structure using Probe Sampling and GC/MS" Case Western Reserve University Summer Undergraduate Research in Energy Sciences Grant Funding: $3,500

Teaching Experience

University of Connecticut, Storrs, CT, USA

Assistant Professor in Residence

Two-time recipient of Provost's Teaching Commendation

- Combustion for Energy Conversion — Fall 2016
- Applied Thermodynamics — Spring 2016, Spring 2017
- Fluid Dynamics 1 — Fall 2015, 2017
- Thermodynamic Principles — Fall 2014–2017; Spring 2015–2016; Summer 2017
- Senior Capstone Design Project Mentor — 2014–2015, 2015–2016, 2016–2017

Professional Service

Combustion Energy Frontier Research Center (CEFRC) 2012–2014
Lead Chair, Junior Associates Committee

- Coordinate monthly teleconferences for graduate students and post-doctoral researchers in the CEFRC where junior members of the CEFRC present recent research results to the group.
- Act as the liaison between the Center's principal investigators and the junior members.

U.S. Department of Energy 2013–2014
Member, EFRC Newsletter Editorial Board

- Contribute articles to the Energy Frontier Research Centers (EFRC) newsletter describing recent scientific advances resulting from EFRC research, including:
  - "Burning Butanol in a Better Engine"
  - "The Advantage of Renewable Fuels in High-Efficiency Engines"
  - "Confined Catalysts Last Longer"
- Edit articles written by other board members for factual and grammatical correctness.

Journal Referee

- Combustion and Flame
- Energy & Fuels
- Proceedings of the Combustion Institute
- Fuel
- Combustion Science & Technology
- Industrial & Engineering Chemistry Research
- Society of Automotive Engineers World Congress
- Measurement

Professional Memberships

American Chemical Society - Member
American Institute of Aeronautics and Astronautics - Member
American Society of Mechanical Engineers - Member
The Combustion Institute - Member