

Bryan W. Weber

CONTACT INFORMATION

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University of Connecticut
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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-ometh-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. Keese, 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

- [18] **B.W. Weber** and K.E. Niemeyer (Presenting). *ChemKED: a human- and machine-readable data standard for chemical kinetics experiments*. Paper MUQ004, 10th International Conference on Chemical Kinetics, Chicago, IL, May 2017.

 arxiv:1706.01987v2

 figshare:10.6084/m9.figshare.5033417


- [17] **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


- [16] **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

- [15] **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


- [14] 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

- [13] **B.W. Weber** and K.E. Niemeyer (Presenting). *Introducing ChemKED: a human- and machine-readable data standard for chemical kinetics experiments*. 16th International Conference on Numerical Combustion, Orlando, FL, Apr. 2017.
🌐 [figshare:10.6084/m9.figshare.4818448](https://figshare.com/figures/data/figshare/4818448)
- [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](https://figshare.com/figures/data/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](https://arxiv.org/abs/1706.01828)
🌐 [figshare:10.6084/m9.figshare.5089564](https://figshare.com/figures/data/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](https://arxiv.org/abs/1706.01827)
🌐 [figshare:10.6084/m9.figshare.5089555](https://figshare.com/figures/data/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](https://arxiv.org/abs/1706.01842)

 [figshare:10.6084/m9.figshare.5089540](https://figshare.com/figures/data/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](https://arxiv.org/abs/1706.01832)

 [figshare:10.6084/m9.figshare.5089519](https://figshare.com/figures/data/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](https://arxiv.org/abs/1706.01837)

 [figshare:10.6084/m9.figshare.5089537](https://figshare.com/figures/data/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](https://figshare.com/figures/data/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](https://figshare.com/figures/data/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](https://figshare.com/figures/data/10.6084/m9.figshare.5084797)

OTHER
PRESENTATIONS

- [1] **B.W. Weber** and C.J. Sung. *An Investigation of Hydrocarbon Flames using Probe Sampling and Gas Chromatography/Mass Spectrometry*. Summer Undergraduate Research in Energy Sciences Program, Dominion Energy East Ohio Branch, Cleveland, OH, Aug. 2008.
 [figshare:10.6084/m9.figshare.5098933](https://figshare.com/figure/10.6084/m9.figshare.5098933)

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