




Bryan W. Weber

CONTACT INFORMATION	 bryan.w.weber@gmail.com  +1-412-443-6447  bryanwweber.com
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
TEACHING EXPERIENCE	<i>University of Connecticut, Storrs, CT, USA</i> 2014–Present Honors: <ul style="list-style-type: none">• Four-time recipient of the University of Connecticut Provost’s Teaching Commendation, awarded to faculty for excellence on their end-of-semester teaching evaluations• Two-time elected Commencement Marshal for Mechanical Engineering by the senior-class students• Nominated for the 2018 University Teaching Innovation Award by the Mechanical Engineering Department Chair Typical enrollment in the courses listed below is 60–100 students per section. <ul style="list-style-type: none">• Applied Mechanical Engineering Laboratory Spring 2019• Applied Thermodynamics Spring 2016–2019• Combustion for Energy Conversion Fall 2016• Fluid Dynamics 1 Fall 2015, 2017• Fluid Dynamics 2 (Compressible Flow) Spring 2018• Senior Capstone Design Project Lecturer/Mentor 2014–2019• Thermodynamic Principles Fall 2014–2018; Spring 2015–2016; Summer 2017
PROFESSIONAL EXPERIENCE	Assistant Professor in Residence , <i>University of Connecticut</i> 2016–Present Visiting Assistant Professor , <i>University of Connecticut</i> 2014–2016 <ul style="list-style-type: none">• Teaching 3 undergraduate courses per semester in thermal-fluids engineering• Integrating and developing open-source software tools to promote higher-level learning outcomes in undergraduate courses• Mentoring undergraduate student teams during their industrially-sponsored capstone design project• Mentoring graduate and undergraduate TAs in grading and tutoring• Conducting research with undergraduate and high-school students to develop software for combustion kinetics• Developing open-source software tools for combustion and chemical kinetic analysis

- Lead Developer, *ThermoState*** 2016–Present
- Developing an open-source package to evaluate thermodynamic properties of simple compressible systems
 - Used in 6 undergraduate Thermodynamics courses at the University of Connecticut, with strong student approval
 - Published in the Journal of Open Source Education doi: <https://doi.org/10.21105/jose.00033>
 - Code is available on GitHub under a permissive open-source license: <https://github.com/bryanwweber/thermostate>
- Co-Lead Developer, *Cantera*** 2013–Present
- Member, *Cantera Steering Committee*** 2018–Present
- Contributing source code to the open-source software toolkit for chemical kinetics, thermodynamics, and transport processes
 - Organized 4 workshops for approximately 200 Cantera users at regional and national meetings of the Combustion Institute
 - Organized 3 annual workshops for 10 Cantera developers
 - Awarded \$3,000 NumFOCUS Small Development Grant to redesign the Cantera website at <https://cantera.org>
 - Code is available on GitHub: <https://github.com/Cantera/cantera>
- Co-Lead Developer, *PyKED*** 2016–Present
- Implemented a Python interface to the ChemKED database format for chemical kinetics experiments
 - Collaborating with researchers from Oregon State University, Columbia University, Trinity University Dublin, and Argonne National Laboratory, among others, to define the database format, project governance, and community standards
 - Used as the data standard for an experimental characterization initiative involving more than 15 international universities
 - Code is available on GitHub: <https://github.com/pr-omethe-us/PyKED>
- 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

GRANTS AND
FELLOWSHIPS

- 2018-07-01 – 2018-07-31 — “Modernize, Reorganize, and Update Cantera’s Documentation”
NumFOCUS Small Development Grant
Funding: \$3,000, Co-PI
- 2018-06-01 – 2018-06-30 — “Integration of Software-Based Problem Solving in Thermodynamics Instruction”
University of Connecticut Provost Mini-Grant
Funding: \$5,000, PI
- 2018-01-01 – 2018-05-05 — “Integrating KEEN E-Learning Module: Resolving Ethical Issues”
University of New Haven/KEEN Mini-Grant
Funding: \$2,000, PI
- 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
- 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

JOURNAL
PUBLICATIONS

- [14] H. Wang, R. Fang, **B.W. Weber**, and C.J. Sung. *An experimental and modeling study of dimethyl ether/methanol blends autoignition at low temperature*. *Combustion and Flame*, vol. 198, pp. 88–99, Dec. 2018. doi:10.1016/j.combustflame.2018.09.012
- [13] **B.W. Weber**. *ThermoState: A state manager for thermodynamics courses*. *Journal*

of Open Source Education, vol. 1, no. 8, pp. 33, Oct. 2018.
doi:10.21105/jose.00033

- [12] **B.W. Weber** and K.E. Niemeyer. *ChemKED: a human- and machine-readable data standard for chemical kinetics experiments*. International Journal of Chemical Kinetics, vol. 50, no. 3, pp. 135–148, Mar. 2018.
doi:10.1002/kin.21142
arxiv:1706.01987v3
- [11] **B.W. Weber**, J.A. Bunnell, K. Kumar, and C.J. Sung. *Experiments and Modeling of the Autoignition of Methyl Pentanoate at Low to Intermediate Temperatures and Elevated Pressures in a Rapid Compression Machine*. Fuel, vol. 212, pp. 479–486, Jan. 2018.
doi:10.1016/j.fuel.2017.10.037
- [10] K. Kumar, J.A. Bunnell, **B.W. Weber**, and C.J. Sung. *Autoignition of Methyl Propanoate and its Comparisons with Methyl Ethanoate and Methyl Butanoate*. Combustion and Flame, vol. 188, pp. 116–128, Jan. 2018.
doi:10.1016/j.combustflame.2017.09.027
- [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
arxiv:1706.04243
- [6] S.M. Burke, U. Burke, R. McDonagh, 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
arxiv:1706.02996

- [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
arxiv:1706.02965
- [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
- [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
- [5] K.E. Niemeyer and **B.W. Weber**. *PyKED: a Python-based tool supporting data analysis and experimental reproducibility in combustion* Poster, 17th Scientific Computing with Python Conference, Austin, TX, July 2018.
doi:10.5281/zenodo.1312239

CONFERENCE
POSTERS

- [4] R. Fang, N. Curtis, **B.W. Weber**, and C.J. Sung. *Fast sampling system for simultaneous speciation and ignition delay measurements in a rapid compression machine*. Poster P11, 10th US National Technical Meeting of the Combustion Institute, College Park, MD, Apr. 2017.
- [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/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/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/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/10.6084/m9.figshare.5098933)

MENTORING

- Ph.D. committee co-chair, Ruozhou Fang, Mechanical Engineering, exp. 2020
- Ph.D. committee member, Taofeek Orekan, Electrical Engineering, 2017
- Ph.D. committee member, Goutham Kukkadapu, Mechanical Engineering, 2016
- M.S. committee member, Rishi Roy, Mechanical Engineering, 2018
- M.S. committee member, Kyle Twarog, Mechanical Engineering, 2018
- M.S. committee member, Justin Bunnell, Mechanical Engineering, 2015

PROFESSIONAL
SERVICE

- Cantera Steering Committee* 2018–Present
Member
- Coordinating Cantera development and activities for the benefit of the community
 - As representative for the Cantera project, attended 2018 NumFOCUS Summit Meeting for all projects sponsored by NumFOCUS
 - Establishing roadmap for Cantera development, including objectives related to technical features and community engagement

University of Connecticut Team Leader

- Led team of 7 faculty from Engineering, Computer Science, Accounting, and Education
- Developed plan to implement project-based learning in the School of Engineering Curriculum at UConnRCMPy
- Presented plan to attendees of the Institute
- Worked with UConn Administration to identify key stakeholders, roadblocks, and resources required to implement Project-Based Learning

Member, ABET Committee

Member, Ph.D. Qualifier Committee

- Developing materials to demonstrate continuing improvement for 2019 ABET accreditation visit
- Developed pre- and post-quizzes for undergraduate Thermodynamics courses in Mechanical Engineering to demonstrate student achievement of ABET outcomes
- Developed Ph.D. qualifying exam questions in collaboration with other department faculty

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.

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
- Journal of Open Source Software

PROFESSIONAL
MEMBERSHIPS

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