

Bryan W. Weber

CONTACT INFORMATION

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RESEARCH INTERESTS

My research interests lie in developing tools to apply fundamental combustion insights to solve engineering problems. My recent work involves developing experimental methods to analyze intermediate species at practical combustion conditions. I am also interested in developing methods to analyze computational models, particularly kinetic models of combustion.

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

Visiting Assistant Professor, University of Connecticut 2014–Present
Conducting research on the combustion kinetics of alternative and traditional fuels.
Teaching undergraduate courses in thermal-fluids engineering.
Mentoring undergraduate students in the capstone design project.

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

- [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](https://doi.org/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

CONFERENCE
PUBLICATIONS
AND
PRESENTATIONS

- [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-propionate 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**, 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.
- [6] **B.W. Weber**, 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.
- [5] S.M. Sarathy, S. Park, W. Wang, P. Veloo, A.C. Davis, C. Togbé, **B.W. Weber**, 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** 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.
- [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, Massachusetts Institute of Technology, Cambridge, MA, Jul. 2011.
- [2] **B.W. Weber** 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, Georgia Institute of Technology, Atlanta, GA, Mar. 2011.
- [1] **B.W. Weber**, 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.
- [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, Massachusetts Institute of Technology, Cambridge, MA, Jul. 2011.

[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.

[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.

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.

TEACHING EXPERIENCE

University of Connecticut, Storrs, CT, USA

Fall 2014, Spring 2015 — Thermodynamic Principles

Fall 2014, Spring 2015 — Senior Capstone Design Project Mentor

Spring 2013 — Introduction to Mechanical Engineering (Instructor)

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

Energy & Fuels

Proceedings of the Combustion Institute

Combustion Science & Technology

Industrial & Engineering Chemistry Research

Society of Automotive Engineers World Congress

AWARDS AND
FELLOWSHIPS

Doctoral Dissertation Fellowship, University of Connecticut, 2014
Graduate Predoctoral Fellowship, Department of Mechanical Engineering, 2013
Graduate Teaching Fellowship, Department of Mechanical Engineering, 2013
Graduate Assistantship in Areas of National Need, University of Connecticut, 2010
Fred H. Vose Prize, Department of Mechanical and Aerospace Engineering, 2009
Summer Undergraduate Research in Energy Sciences Grant, Case Western Reserve University, 2008

PROFESSIONAL
MEMBERSHIPS

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