

# Bryan W. Weber

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RESEARCH INTERESTS	<b>Combustion Engineering:</b> Alternative biofuels including alcohols and biodiesel; design of novel experimental methods for combustion analysis; computational analysis of reaction mechanisms for combustion	
EDUCATION	<b>University of Connecticut, Storrs, CT, USA</b>  Ph.D., Mechanical Engineering, Planned 2014 Working Dissertation Title: <i>High Pressure Ignition Chemistry of Alternative Fuels</i> Advisor: Professor Chih-Jen (Jackie) Sung  M.S., Mechanical Engineering, August 2010 Thesis Title: <i>Autoignition of n-Butanol at Low to Intermediate Temperature and Elevated Pressure</i> Advisor: Professor Chih-Jen (Jackie) Sung  <b>Case Western Reserve University, Cleveland, OH, USA</b>  B.S.E., <i>Cum Laude</i> Aerospace Engineering, May 2009 Senior Project Title: <i>Analysis of Heavy Hydrocarbon Fuels using Gas Chromatography with Mass Spectrometry</i> Advisor: Professor Chih-Jen (Jackie) Sung	
JOURNAL PUBLICATIONS	<b>B.W. Weber</b> , W.J. Pitz, M. Mehl, A.C. Davis, E.J. Silke, and C.J. Sung. <i>Experiments and Modeling of the Autoignition of Methylcyclohexane at High Pressure</i> . Combustion and Flame, 2014. doi: <a href="https://doi.org/10.1016/j.combustflame.2014.01.018">10.1016/j.combustflame.2014.01.018</a>  S.M. Sarathy, S. Park, <b>B.W. Weber</b> , 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. <i>A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion</i> . Combustion and Flame, vol. 160, no. 12, pp. 2712-2728, Dec. 2013. doi: <a href="https://doi.org/10.1016/j.combustflame.2013.06.022">10.1016/j.combustflame.2013.06.022</a>  <b>B.W. Weber</b> and C.J. Sung. <i>Comparative Autoignition Trends in Butanol Isomers at Elevated Pressure</i> . Energy and Fuels, vol. 27, no. 3, pp. 1688-1698, Feb. 2013. doi: <a href="https://doi.org/10.1021/ef302195c">10.1021/ef302195c</a>  T. Tsujimura, W.J. Pitz, F. Gillespie, H.J. Curran, <b>B.W. Weber</b> , Y. Zhang, and C.J. Sung. <i>Development of Isopentanol Reaction Mechanism Reproducing Autoignition Character at High and Low Temperatures</i> . Energy and Fuels, vol. 26, no. 8, pp. 4871-4886, Aug. 2012. doi: <a href="https://doi.org/10.1021/ef300879k">10.1021/ef300879k</a>  <b>B.W. Weber</b> , K. Kumar, Y. Zhang, and C.J. Sung. <i>Autoignition of n-butanol at elevated pressure and low-to-intermediate temperature</i> . Combustion and Flame, vol. 158, no. 5, pp. 809-819, Mar. 2011. doi: <a href="https://doi.org/10.1016/j.combustflame.2011.02.005">10.1016/j.combustflame.2011.02.005</a>	

CONFERENCE PUBLICATIONS AND PRESENTATIONS	S.S. Merchant (Presenting), W.H. Green, K.M. Van Geem, N. Hansen, <b>B.W. Weber</b> , and C.J. Sung. <i>Combustion of the Butanol Isomers: Reaction Pathways from High to Low Temperature</i> . 8 <sup>th</sup> International Conference on Chemical Kinetics, University Seville, Seville, Spain, July 2013.
	<b>B.W. Weber</b> , W.J. Pitz, C.J. Sung, M. Mehl, E.J. Silke, and A.C. Davis. <i>Experiments and Modeling of the Autoignition of Methyl-Cyclohexane at High Pressure</i> . Paper 3A02, 8 <sup>th</sup> US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.
	<b>B.W. Weber</b> , S.S. Merchant, C.J. Sung, and W.H. Green. <i>An Autoignition Study of iso-Butanol: Experiments and Modeling</i> . Paper 3A01, 8 <sup>th</sup> US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.
	S.M. Sarathy, S. Park, W. Wang, P. Veloo, A.C. Davis, C. Togbé, <b>B.W. Weber</b> , 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. <i>A Comprehensive Experimental and Modeling Study of iso-Pentanol Combustion</i> . Paper 2A12, 8 <sup>th</sup> US National Technical Meeting of the Combustion Institute, Park City, UT, May 2013.
	<b>B.W. Weber</b> and C.J. Sung. <i>Comparative Investigation of the High Pressure Autoignition of the Butanol Isomers</i> . Paper A-01, Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT, October 2011.
	M.R. Harper, W.H. Green (Presenting), K.M. Van Geem, <b>B.W. Weber</b> , C.J. Sung, I. Stranic, D.F. Davidson, and R.K. Hanson. <i>Combustion of the butanol isomers: Reaction pathways at elevated pressures from low-to-high temperatures</i> . Paper #84, 7 <sup>th</sup> International Conference on Chemical Kinetics, Massachusetts Institute of Technology, Cambridge, MA, July 2011.
CONFERENCE POSTERS	<b>B.W. Weber</b> and C.J. Sung. <i>A Rapid Compression Study of the Butanol Isomers at Elevated Pressure</i> . Paper 1B13, 7 <sup>th</sup> US National Technical Meeting of the Combustion Institute, Georgia Institute of Technology, Atlanta, GA, March 2011.
	<b>B.W. Weber</b> , K. Kumar, and C.J. Sung. <i>Autoignition of Butanol Isomers at Low to Intermediate Temperature and Elevated Pressure</i> . Paper AIAA-2011-0316, 49 <sup>th</sup> Annual Aerospace Sciences Meeting, Orlando, FL, January 2011.
	<b>B.W. Weber</b> and C.J. Sung. <i>Validation of Kinetic Models of the Butanol Isomers At High Pressure using a Rapid Compression Machine</i> . Poster T40, 7 <sup>th</sup> International Conference on Chemical Kinetics, Massachusetts Institute of Technology, Cambridge, MA, July 2011.
OTHER PRESENTATIONS	<b>B.W. Weber</b> . <i>Autoignition of n-Butanol at Elevated Pressure and Low to Intermediate Temperature</i> . 1 <sup>st</sup> Combustion Energy Frontier Research Center Annual Meeting, Princeton University, Princeton, NJ, September 2010.
	<b>B.W. Weber</b> , K. Kumar, and C.J. Sung. <i>An Investigation of Hydrocarbon Flames using Probe Sampling and Gas Chromatography/Mass Spectrometry</i> . Support of Undergraduate Research and Creative Endeavors Symposium and Poster Session, Case Western Reserve University, Cleveland, OH, April 2009.
	<b>B.W. Weber</b> and C.J. Sung. <i>Analysis of Hydrocarbon Fuels using Gas Chromatography/Mass Spectrometry</i> . Summer Undergraduate Research in Energy Sciences Program, Dominion Energy East Ohio Branch, Cleveland, OH, August 2008.

RESEARCH  
EXPERIENCE

**Combustion Diagnostics Laboratory**

2007-Present

University of Connecticut, Storrs, CT, USA

Case Western Reserve University, Cleveland, OH, USA

Projects:

- Experimentally and computationally studying the ignition properties of the four butanol isomers, iso-pentanol, methylcyclohexane, and propene over a wide range of pressure, temperature, and fuel-loading conditions
- Designing a species sampling apparatus for time-resolved species measurements in the rapid compression machine
- Characterizing the components of heavy hydrocarbon fuels, including conventional and synthetic jet fuels, using gas chromatography/mass spectrometry

TEACHING  
EXPERIENCE

**University of Connecticut, Storrs, CT, USA**

Fall 2012 – Spring 2013

Spring 2013 – Instructor for ENGR 1166: Introduction to Mechanical Engineering

Supervisor: Prof. Kevin Murphy

Lecture notes and sample homework problems are available on request

- Prepared and delivered lectures covering fundamental topics in Mechanical Engineering, including: Vector Math and Calculus, Statics, Dynamics, Solid Mechanics, Thermodynamics, Fluid Mechanics, and Heat Transfer
- Prepared and graded weekly homework assignments for 60 2<sup>nd</sup> semester engineering students
- Held weekly office hour sessions

Fall 2012 – Teaching Assistant for ME 3239: Combustion for Energy Conversion

Supervisor: Prof. Chih-Jen Sung

Sample project assignments are available on request

- Assisted the preparation and delivery of lecture material covering: Thermochemistry and Equilibrium, Chemical Kinetics, Fuels and Emissions, and Reacting Flows
- Developed and presented lectures covering the fundamentals and operation of combustion modeling software
- Designed in-depth projects to explore combustion modeling using the CHEMKIN-Pro software

PROFESSIONAL  
EXPERIENCE

**Lead Chair, Junior Associates Committee**

2012-Present

**Combustion Energy Frontier Research Center**

- Coordinate monthly teleconferences for graduate students and post-doctoral researchers in the CEFRC
- Attend PI teleconferences on behalf of the junior members of the CEFRC

**EFRC Newsletter Editorial Board Member**

2013-Present

**U.S. Department of Energy**

- Contributed articles to the 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"
- Edited articles written by other board members for factual and grammatical correctness

**Journal Referee**

2013-Present

- Energy & Fuels
- Proceedings of the Combustion Institute

AWARDS AND FELLOWSHIPS	<b>Doctoral Dissertation Fellowship</b> <b>University of Connecticut</b> Competitively awarded to Ph.D. candidates who have completed their dissertation proposal	2014
	<b>Graduate Predoctoral Fellowship Award</b> <b>University of Connecticut, Department of Mechanical Engineering</b> First Place, awarded for the best research presentation and poster at the 2013 Mechanical Engineering Graduate Research Competition	2013
	<b>Graduate Assistantship in Areas of National Need</b> <b>University of Connecticut</b> Awarded in the area of Sustainable Energy Technologies	2010
	<b>Fred H. Vose Prize, Department of Mechanical and Aerospace Engineering</b> <b>Case Western Reserve University</b> Awarded to the senior showing the most promise for future leadership	2009
	<b>Summer Undergraduate Research in Energy Sciences Grant</b> <b>Case Western Reserve University</b> Awarded for research to analyze the composition of traditional petroleum-based hydrocarbon fuels using GC/MS	2008
PROFESSIONAL MEMBERSHIPS	AIAA - Student Member ASME - Student Member The Combustion Institute - Student Member ACS - Student Member	
SKILLS	Programming/Scripting Languages: <ul style="list-style-type: none"> <li>• Python, MATLAB, FORTRAN 77, UNIX shell scripting (bash), LabView</li> </ul> Software Packages: <ul style="list-style-type: none"> <li>• CHEMKIN-II and associated programs (SENKIN, etc.)</li> <li>• CHEMKIN-Pro</li> <li>• Cantera</li> <li>• Microsoft Office, <math>\text{\TeX}</math> (<math>\text{\X}\text{\TeX}</math>, <math>\text{\E}\text{\TeX}</math>, <math>\text{\B}\text{\TeX}</math>), Google Docs</li> <li>• Solidworks 3D Modeling</li> </ul> Operating Systems: <ul style="list-style-type: none"> <li>• Microsoft Windows (XP, Vista, 7, 8), Linux (Ubuntu)</li> </ul>	