

Kyle Evan Niemeyer, Ph.D.

School of Mechanical, Industrial, & Manufacturing Engineering, Oregon State University

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RESEARCH INTERESTS

Computational modeling of reacting and non-reacting fluid flows, fluid-structure interaction, chemical reaction mechanism reduction methods, GPU computing. Also interested in open access, open source, and open science in general; software citation.

EDUCATION

Case Western Reserve University

Cleveland, Ohio

Department of Mechanical and Aerospace Engineering

2005–2013

Ph.D., Mechanical Engineering, August 2013

Advisor: Chih-Jen Sung

Dissertation Title: “[Reducing the Cost of Chemistry in Reactive-Flow Simulations: Novel Mechanism Reduction Strategies and Acceleration via Graphics Processing Units](#)”

GPA: 4.0/4.0

M.S., Aerospace Engineering, January 2010

Advisor: Chih-Jen Sung

Thesis Topic: “[Skeletal Mechanism Generation for Surrogate Fuels](#)”

GPA: 4.0/4.0

B.S., *summa cum laude*, Aerospace Engineering, January 2009

GPA: 4.0/4.0

PROFESSIONAL EXPERIENCE

Oregon State University

Corvallis, Oregon

School of Mechanical, Industrial, and Manufacturing Engineering

Assistant Professor

September 2015–

Assistant Professor (Senior Research)

2014–2015

Postdoctoral Scholar

2013–2014

Case Western Reserve University

Cleveland, Ohio

Department of Mechanical and Aerospace Engineering

Graduate Research Assistant

2008–2013

Teaching Assistant

2007–2010

Undergraduate Research Assistant

2007

United Technologies Research Center

East Hartford, Connecticut

Summer Research Intern, Combustion Group

2011

[Ars Technica](#)

Associate Science Writer

2011–2013

NASA Glenn Research Center

Cleveland, Ohio

Summer Intern, Combustion Branch



2008

ARTICLES IN
PREPARATION





4. Katherine M. Smith, Peter E. Hamlington, Skyler Kern, Marco Zavatarelli, Nadia Pinardi, Emily F. Klee*, and **Kyle E. Niemeyer**. “Reduced-Order Biogeochemical Flux Model for Upper Ocean Biophysical Simulations.”
3. Tejas C. Mulky*, W. Jayani Jayasuriya*, and **Kyle E. Niemeyer**. “Smoldering combustion in cellulose and hemicellulose mixtures: Examining the roles of density, fuel composition, oxygen concentration, and moisture content.”
2. Andrew T. Alferman*, Nicholas J. Curtis, and **Kyle E. Niemeyer**. “Evaluating stiffness metrics for predicting the cost of chemical kinetics integration.”
1. Erica C. Fischer, Amit H. Varma, W. Jayani Jayasuriya*, and **Kyle E. Niemeyer**. “A Review of Traveling Fire Models for Structural Fire Engineering.”

SUBMITTED
ARTICLES

* or † indicates an Oregon State graduate or undergraduate student, respectively, at time of publication.

4. Aaron J. Fillo*, Jason Schlup, Guillaume Blanquart, **Kyle E. Niemeyer**. “A fast, low-cost, and stable memory algorithm for implementing multicomponent transport in direct numerical simulations.” Under review.
 [arXiv:1808.05463](https://arxiv.org/abs/1808.05463) [physics.flu-dyn]
3. Nicholas J. Curtis, **Kyle E. Niemeyer**, and Chih-Jen Sung. “Accelerating reactive-flow simulations using vectorized chemical kinetic integration.” Under review.
2. Jeffrey F. Glusman, **Kyle E. Niemeyer**, Amanda S. Makoweicki, Nicholas T. Wimer, Gregory B. Rieker, Peter E. Hamlington, and John W. Daily. “A Reduced Gas-Phase Kinetic Model for Burning of Douglas Fir.” Under review.
1. Daniel J. Magee* and **Kyle E. Niemeyer**. “Applying the swept rule for explicit partial differential equation solutions on heterogeneous computing systems.” Under review.
 [arXiv:1811.08282](https://arxiv.org/abs/1811.08282) [cs.MS]

REFEREED
JOURNAL
ARTICLES

37. Rolf Sander, Andreas Baumgaertner, David Cabrera, Sergey Gromov, Hartwig Harder, Patrick Jöckel, Vlassis A. Karydis, **Kyle E. Niemeyer**, Andrea Pozzer, Martin Schultz, Domenico Taraborrelli, Sebastian Tauer, Franziska Frank, Vincent Huijnen, Jens-Uwe Groö, and Hella Riede. 2019. “The atmospheric chemistry box model CAABA/MECCA-4.0gmd.” *Geoscientific Model Development*, 12(4):1365–1385.
 <https://doi.org/10.5194/gmd-12-1365-2019>
36. Benjamin D. Smucker*, Tejas C. Mulky*, Daniel A. Cowan*, **Kyle E. Niemeyer**, and David L. Blunck. 2019. “Effects of fuel content and density on the smoldering characteristics of cellulose and hemicellulose.” *Proceedings of the Combustion Institute*, 37(3):4107–4116.
 <https://doi.org/10.1016/j.proci.2018.07.047>
35. Tejas C. Mulky* and **Kyle E. Niemeyer**. 2019. “Computational study of the effects of density, fuel content, and moisture content on smoldering propagation of cellulose and hemicellulose mixtures.” *Proceedings of the Combustion Institute*, 37(3):4091–4098.
 <https://doi.org/10.1016/j.proci.2018.06.164>
 [arXiv:1806.08396](https://arxiv.org/abs/1806.08396) [physics.flu-dyn]

34. Shane R. Daly^{*}, Khang Tran^{*}, **Kyle E. Niemeyer**, William J. Cannella, and Christopher L. Hagen. 2019. “Predicting fuel low-temperature combustion performance using Fourier-transform infrared absorption spectra of neat hydrocarbons.” *Fuel*, 242:343–344.
 <https://doi.org/10.1016/j.fuel.2019.01.054>
33. Daniel S. Katz, Gabrielle Allen, Lorena A. Barba, Devin R. Berg, Holly Bik, Carl Boettiger, Christine L. Borgman, C. Titus Brown, Stuart Buck, Randy Burd, Anita de Waard, Martin Paul Eve, Brian E. Granger, Josh Greenberg, Adina Howe, Bill Howe, May Khanna, Timothy L. Killeen, Matthew Mayernik, Erin McKiernan, Chris Mentzel, Nirav Merchant, **Kyle E. Niemeyer**, Laura Noren, Sarah M. Nusser, Daniel A. Reed, Edward Seidel, MacKenzie Smith, Jeffrey R. Spies, Matthew Turk, John D. Van Horn, and Jay Walsh. 2018. “The principles of tomorrow’s university [version 1; referees: 2 approved].” *F1000 Research*, 7:1926.
  <https://doi.org/10.12688/f1000research.17425.1>
32. Katherine M. Smith, Peter E. Hamlington, **Kyle E. Niemeyer**, Baylor Fox-Kemper, and Nicole S. Lovenduski. 2018. “Effects of Langmuir turbulence on upper ocean carbonate chemistry.” *Journal of Advances in Modeling Earth Systems*, 10:3030–3048.
  <https://doi.org/10.1029/2018MS001486>
31. Devin R. Berg and **Kyle E. Niemeyer**. 2018. “The case for openness in engineering research [version 2; referees: 1 approved, 1 approved with reservations].” *F1000 Research*, 7:501.
  <https://doi.org/10.12688/f1000research.14593.2>
30. Nicholas J. Curtis, **Kyle E. Niemeyer**, and Chih-Jen Sung. “Using SIMD and SIMT vectorization to evaluate sparse chemical kinetic Jacobian matrices and thermochemical source terms.” 2018. *Combustion and Flame*, 198:186–204.
 <https://doi.org/10.1016/j.combustflame.2018.09.008>
 [arXiv:1809.01029](https://arxiv.org/abs/1809.01029) [physics.comp-ph]
29. Shane R. Daly^{*}, **Kyle E. Niemeyer**, William J. Cannella, and Christopher L. Hagen. 2018. “FACE gasoline surrogates formulated by an enhanced multivariate optimization framework.” *Energy & Fuels*, 32(7):7916–7932.
 <https://doi.org/10.1021/acs.energyfuels.8b01313>
 [arXiv:1806.06982](https://arxiv.org/abs/1806.06982) [physics.chem-ph]
28. Miguel F. Soler^{*} and **Kyle E. Niemeyer**. 2018. “Analysis of an approach for detecting arc positions during vacuum arc remelting based on magnetic flux density measurements.” *Journal of Manufacturing Science and Engineering*, 140(7):071004.
 <https://doi.org/10.1115/1.4039439>
 <https://osf.io/wca5h/>
27. Christopher P. Stone, Andrew T. Alferman^{*}, and **Kyle E. Niemeyer**. 2018. “Accelerating finite-rate chemical kinetics with coprocessors: comparing vectorization methods on GPUs, MICs, and CPUs.” *Computer Physics Communications*, 226:18–29.
 <https://doi.org/10.1016/j.cpc.2018.01.015>
 [arXiv:1608.05794](https://arxiv.org/abs/1608.05794) [physics.comp-ph]
26. Arfon M. Smith, **Kyle E. Niemeyer**, Daniel S. Katz, Lorena A. Barba, George Githinji, Melissa Gymrek, Kathryn D. Huff, Christopher R. Madan, Abigail Cabunoc Mayes, Kevin M. Moerman, Pjotr Prins, Karthik Ram, Ariel Rokem, Tracy K. Teal,

- Roman Valls Guimera, and Jacob T. Vanderplas. 2018. “Journal of Open Source Software (JOSS): design and first-year review.” *PeerJ Computer Science*, 4:e147.
DOI <https://doi.org/10.7717/peerj-cs.147>
25. Daniel S. Katz, **Kyle E. Niemeyer**, Sandra Gesing, Lorraine Hwang, Wolfgang Bangerth, Simon Hettrick, Ray Idaszak, Jean Salac, Neil Chue Hong, Santiago Núñez-Corrales, Alice Allen, R. Stuart Geiger, Jonah Miller, Emily Chen, Anshu Dubey, and Patricia Lago. 2018. “Fourth Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE4).” *Journal of Open Research Software*, 6(1):10.
DOI <https://doi.org/10.5334/jors.184>
24. Bryan W. Weber and **Kyle E. Niemeyer**. 2018. “ChemKED: a human- and machine-readable data standard for chemical kinetics experiments.” *International Journal of Chemical Kinetics*, 50(3):135–148.
DOI <https://doi.org/10.1002/kin.21142>
arXiv:1706.01987 [physics.chem-ph]
23. Daniel J. Magee* and **Kyle E. Niemeyer**. 2018. “Accelerating solutions of PDEs with GPU-based swept time-space decomposition.” *Journal of Computational Physics*, 357:338–352.
DOI <https://doi.org/10.1016/j.jcp.2017.12.028>
arXiv:1705.03162 [physics.comp-ph]
22. Sai Krishna Sirumalla, Morgan A. Mayer†, **Kyle E. Niemeyer**, and Richard H. West. 2018. “Assessing impacts of discrepancies in model parameters on autoignition model performance: a case study using butanol.” *Combustion and Flame* 190:284–292.
DOI <https://doi.org/10.1016/j.combustflame.2017.11.018>
arXiv:1708.02232 [physics.chem-ph]
21. Jonathan P. Tennant, Jonathan M. Dugan, Daniel Graziotin, Damien C. Jacques, François Waldner, Daniel Mietchen, Yehia Elkhathib, Lauren B. Collister, Christina K. Pikas, Tom Crick, Paola Masuzzo, Anthony Caravaggi, Devin R. Berg, **Kyle E. Niemeyer**, Tony Ross-Hellauer, Sara Mannheimer, Lillian Rigling, Daniel S. Katz, Bastian Greshake, Josmel Pacheco-Mendoza, Nazeefa Fatima, Marta Poblet, Marinos Isaakidis, Dasapta Erwin Irawan, Sébastien Renaut, Christopher R. Madan, Lisa Matthias, Jesper Nørgaard Kjær, Daniel Paul O’Donnell, Cameron Neylon, Sarah Kearns, Manojkumar Selvaraju, and Julien Colomb. 2017. “A multi-disciplinary perspective on emergent and future innovations in peer review [version 3; referees: 2 approved].” *F1000Research* 6:1151.
DOI <https://doi.org/10.12688/f1000research.12037.3>
20. Shyam Menon, Himakar Ganti*, **Kyle E. Niemeyer**, and Christopher L. Hagen. 2017. “Effects of oil and water contamination on natural gas engine combustion processes.” *Journal of Natural Gas Science & Engineering*, 41:30–39.
DOI <https://doi.org/10.1016/j.jngse.2017.02.038>
<https://osf.io/h5dru/>
19. Nicholas J. Curtis, **Kyle E. Niemeyer**, and Chih-Jen Sung. 2017. “An investigation of GPU-based stiff chemical kinetics integration methods.” *Combustion and Flame*, 179:312–324.
DOI <https://doi.org/10.1016/j.combustflame.2017.02.005>
arXiv:1607.03884 [physics.comp-ph]

18. **Kyle E. Niemeyer**, Nicholas J. Curtis, and Chih-Jen Sung. 2017. “pyJac: analytical Jacobian generator for chemical kinetics.” *Computer Physics Communications*, 215:188–203.
 <https://doi.org/10.1016/j.cpc.2017.02.004>
 [arXiv:1605.03262](https://arxiv.org/abs/1605.03262) [physics.comp-ph]
17. Xin Hui, **Kyle E. Niemeyer**, Kyle B. Brady, and Chih-Jen Sung. 2017. “Reduced chemistry for butanol isomers at engine-relevant conditions.” *Energy & Fuels*, 31(1):867–881.
 <https://doi.org/10.1021/acs.energyfuels.6b01857>
 [arXiv:1706.02043](https://arxiv.org/abs/1706.02043) [physics.chem-ph]
16. Daniel S. Katz, Sou-Cheng T. Choi, **Kyle E. Niemeyer**, James Hetherington, Frank Löffler, Dan Gunter, Ray Idaszak, Steven R. Brandt, Mark A. Miller, Sandra Gesing, Nick D. Jones, Nic Weber, Suresh Marru, Gabrielle Allen, Birgit Penzenstadler, Colin C. Venters, Ethan Davis, Lorraine Hwang, Ilian Todorov, Abani Patra, and Miguel De Val-Borro. 2016. “Report on the Third Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE3).” *Journal of Open Research Software*, 4:e37.
  <https://doi.org/10.5334/jors.118>
15. **Kyle E. Niemeyer**, Arfon M. Smith, and Daniel S. Katz. 2016. “The challenge and promise of software citation for credit, identification, discovery, and reuse.” *ACM Journal of Data and Information Quality*, 7(4):16.
 <https://doi.org/10.1145/2968452>
 [arXiv:1601.04734](https://arxiv.org/abs/1601.04734) [cs.CY]
14. Arfon M. Smith, Daniel S. Katz, **Kyle E. Niemeyer**, and the FORCE11 Software Citation Working Group. 2016. “Software citation principles.” *PeerJ Computer Science*, 2:e86.
  <https://doi.org/10.7717/peerj-cs.86>
13. Shane R. Daly*, **Kyle E. Niemeyer**, William J. Cannella, and Christopher L. Hagen. 2016. “Predicting fuel research octane number using Fourier-transform infrared absorption spectra of neat hydrocarbons.” *Fuel*, 183: 359–365.
 <https://doi.org/10.1016/j.fuel.2016.06.097>
 [arXiv:1606.07122](https://arxiv.org/abs/1606.07122) [physics.chem-ph]
12. Fengquan Zhong, Sugang Ma, Xinyu Zhang, Chih-Jen Sung, and **Kyle E. Niemeyer**. 2015. “Development of efficient and accurate skeletal mechanisms for hydrocarbon fuels and kerosene surrogate.” *Acta Mechanica Sinica*, 31(5): 732–740.
 <https://doi.org/10.1007/s10409-015-0434-5>
11. Kyle B. Brady, Xin Hui, Chih-Jen Sung, and **Kyle E. Niemeyer**. 2015. “Counterflow ignition of n-butanol at atmospheric and elevated pressures.” *Combustion and Flame*, 162(10): 3596–3611.
 <https://doi.org/10.1016/j.combustflame.2015.06.017>
10. **Kyle E. Niemeyer**, Shane R. Daly*, William J. Cannella, and Christopher L. Hagen. 2015. “Investigation of the LTC fuel performance index for oxygenated reference fuel blends.” *Fuel*, 155: 14–24.
 <https://doi.org/10.1016/j.fuel.2015.04.010>
 <https://osf.io/f9tm8/>

9. **Kyle E. Niemeyer**, Shane R. Daly^{*}, William J. Cannella, and Christopher L. Hagen. 2015. “A novel fuel performance index for low-temperature combustion engines based on operating envelopes in light-duty driving cycle simulations.” *Journal of Engineering for Gas Turbines and Power*, 137(10): 101601.
DOI <https://doi.org/10.1115/1.4029948>
OSF <https://osf.io/zd9tc/>
8. **Kyle E. Niemeyer** and Chih-Jen Sung. 2015. “Reduced chemistry for a gasoline surrogate valid at engine-relevant conditions.” *Energy & Fuels*, 29(2): 1172–1185.
DOI <https://doi.org/10.1021/ef5022126>
arXiv:1410.0401 [physics.chem-ph]
7. Nicholas J. Curtis, **Kyle E. Niemeyer**, and Chih-Jen Sung. 2015. “An automated target species selection method for dynamic adaptive chemistry simulations.” *Combustion and Flame*, 162(4): 1358–1374.
DOI <https://doi.org/10.1016/j.combustflame.2014.11.004>
arXiv:1804.01591 [physics.chem-ph]
6. **Kyle E. Niemeyer** and Chih-Jen Sung. 2014. “Mechanism reduction for multicomponent surrogates: a case study using toluene reference fuels.” *Combustion and Flame*, 161(11): 2752–2764.
DOI <https://doi.org/10.1016/j.combustflame.2014.05.001>
arXiv:1405.3745 [physics.chem-ph]
5. **Kyle E. Niemeyer** and Chih-Jen Sung. 2014. “Accelerating moderately stiff chemical kinetics in reactive-flow simulations using GPUs.” *Journal of Computational Physics*, 256: 854–871.
DOI <https://doi.org/10.1016/j.jcp.2013.09.025>
arXiv:1309.2710 [physics.chem-ph]
4. **Kyle E. Niemeyer** and Chih-Jen Sung. 2014. “Recent progress and challenges in exploiting graphics processors in computational fluid dynamics.” *Journal of Supercomputing*, 67(2): 528–564.
DOI <https://doi.org/10.1007/s11227-013-1015-7>
arXiv:1309.3018 [physics.flu-dyn]
3. **Kyle E. Niemeyer** and Chih-Jen Sung. 2011. “On the importance of graph search algorithms for DRGEP-based mechanism reduction methods.” *Combustion and Flame*, 158(8): 1439–1443.
DOI <https://doi.org/10.1016/j.combustflame.2010.12.010>
arXiv:1606.07802 [cs.DS]
2. **Kyle E. Niemeyer**, Chih-Jen Sung, and Mandhapati P. Raju. 2010. “Skeletal mechanism generation for surrogate fuels using directed relation graph with error propagation and sensitivity analysis.” *Combustion and Flame*, 157(9): 1760–1770.
DOI <https://doi.org/10.1016/j.combustflame.2009.12.022>
arXiv:1607.05079 [physics.chem-ph]
1. Craig R. Slyfield, **Kyle E. Niemeyer**, Evgeniy V. Tkachenko, Ryan E. Tomlinson, Grant G. Steyer, Cameron G. Patthanacharoenphon, Galatia J. Kazakia, David L. Wilson, and Christopher J. Hernandez. 2009. “Three-dimensional surface texture visualization of bone tissue through epifluorescence-based serial block face imaging.”

Journal of Microscopy, 236(1): 52–59.

doi <https://doi.org/10.1111/j.1365-2818.2009.03204.x>

BOOKS

2. Lorena A. Barba, Lecia J. Barker, Douglas S. Blank, Jed Brown, Allen B. Downey, Timothy George, Lindsey J. Heagy, Kyle T. Mandli, Jason K. Moore, David Lippert, **Kyle E. Niemeyer**, Ryan R. Watkins, Richard H. West, Elizabeth Wickes, Carol Willing, and Michael Zingale. 2018. *Teaching and Learning with Jupyter*
doi <https://jupyter4edu.github.io/jupyter-edu-book/>
1. Sonja Bezjak, April Clyburne-Sherin, Philipp Conzett, Pedro Fernandes, Edit Görögh, Kerstin Helbig, Bianca Kramer, Ignasi Labastida, **Kyle Niemeyer**, Fotis Psomopoulos, Tony Ross-Hellauer, René Schneider, Jon Tennant, Ellen Verbakel. 2018. *Open Science Training Handbook*.
doi <https://doi.org/10.5281/zenodo.1212495>

BOOK
CHAPTERS

1. **Kyle E. Niemeyer** and Chih-Jen Sung. 2014. “GPU-Based Parallel Integration of Large Numbers of Independent ODE Systems.” In V. Kindratenko (Ed.), *Numerical Computations with GPUs*, Springer International Publishing, Switzerland, Ch. 8, pp. 159–182.
doi https://doi.org/10.1007/978-3-319-06548-9_8

REFEREED
CONFERENCE
PAPERS

4. **Kyle E. Niemeyer**. “A Project-Based Course on Software Development for (Engineering) Research.” In: Rodrigues J. et al. (eds) *Computational Science – ICCS 2019. Lecture Notes in Computer Science*, vol 11540: 401–407. Springer, Cham.
doi https://doi.org/10.1007/978-3-030-22750-0_32
3. Daniel S. Katz, **Kyle E. Niemeyer**, Arfon M. Smith, and the FORCE11 Software Citation Working Group. “Software citation: Process, principles, and implementation.” *Proc. of the Fourth Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE4)*, University of Manchester, Manchester, UK. 12–14 September, 2016. CEUR-WS.org, online.
doi [CEUR-WS.org/Vol-1686/WSSSPE4_paper_31.pdf](https://ceur-ws.org/Vol-1686/WSSSPE4_paper_31.pdf)
2. **Kyle E. Niemeyer**. “PyTeCK: a Python-based automatic testing package for chemical kinetic models.” *Proceedings of the 15th Python in Science Conference (SciPy 2016)*, Austin, TX, USA. 11–17 July 2016.
doi <https://doi.org/10.25080/Majora-629e541a-00c>
1. **Kyle E. Niemeyer**, Shane R. Daly*, William J. Cannella, and Christopher L. Hagen. “A novel fuel performance index for LTC engines based on operating envelopes in light-duty driving cycle simulations.” ASME 2014 Internal Combustion Engine Division Fall Technical Conference (ICEF), Columbus, IN, USA. 19–22 October 2014. Paper no. ICEF2014-5478.
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CONFERENCE
PAPERS/TALKS

36. **Kyle E. Niemeyer**, Raymond L. Speth, Bryan W. Weber, and Richard H. West. “A review of evidence-based best practices for developing research software in combustion.” 11th U.S. National Combustion Meeting, Pasadena, CA, USA. 24–27 March 2019.

35. Morgan A. Mayer[†], **Kyle E. Niemeyer**. “Performance comparison of chemical kinetic models for toluene autoignition.” 11th U.S. National Combustion Meeting, Pasadena, CA, USA. 24–27 March 2019.
34. Aaron J. Fillo^{*}, **Kyle E. Niemeyer**. “Assessing the impact of multicomponent transport on the vorticity budget of turbulent premixed flames.” 11th U.S. National Combustion Meeting, Pasadena, CA, USA. 24–27 March 2019.
33. Aaron J. Fillo^{*}, **Kyle E. Niemeyer**. “Assessing the impact of chemical kinetic model reduction on premixed turbulent flame characteristics.” 2018 Spring Technical Meeting of the Western States Section of the Combustion Institute, Bend, OR, USA. 26–27 March 2018.
32. Aaron J. Fillo^{*}, **Kyle E. Niemeyer**. “LIB LAB the Library Laboratory: Hands-on multimedia science communication.” 2018 Spring Technical Meeting of the Western States Section of the Combustion Institute, Bend, OR, USA. 26–27 March 2018.
31. Jeffrey F. Glusman, Amanda S. Makoweicki, Nicholas T. Wimer, **Kyle E. Niemeyer**, Gregory B. Rieker, Peter E. Hamlington and John W. Daily. “A chemical kinetic model reduction and pyrolysis model for wildland fire direct numerical simulation.” 2018 Spring Technical Meeting of the Western States Section of the Combustion Institute, Bend, OR, USA. 26–27 March 2018.
30. Sai Krishna Sirumalla, Morgan Mayer[†], **Kyle E. Niemeyer**, and Richard West. “Introducing a workflow for improving kinetic models: Case study using butanol.” 2018 Spring Technical Meeting of the Eastern States Section of the Combustion Institute, State College, PA, USA. 4–7 March 2018.
29. Francis M. Haas, C. Franklin Goldsmith, Michael P. Burke, Bryan W. Weber, and **Kyle E. Niemeyer**. “ChemKED for profile-resolved data: A discussion of some salient data standard features.” 2018 Spring Technical Meeting of the Eastern States Section of the Combustion Institute, State College, PA, USA. 4–7 March 2018.
28. Morgan A. Mayer[†] and **Kyle E. Niemeyer**. “Comparison and analysis of chemical kinetic models for toluene autoignition.” 2017 Fall Technical Meeting of the Western States Section of the Combustion Institute, Laramie, WY, USA. 2–3 October 2017.
27. Phillip O. Mestas[†], Parker Clayton[†], and **Kyle E. Niemeyer**. “pyMARS: An open software package for reducing chemical kinetics models.” 2017 Fall Technical Meeting of the Western States Section of the Combustion Institute, Laramie, WY, USA. 2–3 October 2017.
26. Aaron J. Fillo^{*}, Jason Schlup, Guillaume Blanquart, and **Kyle E. Niemeyer**. “Implementing and assessing the importance of multicomponent transport properties using direct numerical simulations of premixed, turbulent flames.” 2017 Fall Technical Meeting of the Western States Section of the Combustion Institute, Laramie, WY, USA. 2–3 October 2017.
25. Matthew F. Zaiger^{*} and **Kyle E. Niemeyer**. “Preliminary study of the interactions between detonation chemistry and magnetohydrodynamics.” 2017 Fall Technical Meeting of the Western States Section of the Combustion Institute, Laramie, WY, USA. 2–3 October 2017.

24. Andrew Alferman* and **Kyle E. Niemeyer**. “Investigating stiffness detection metrics for chemical kinetics.” 2017 Fall Technical Meeting of the Western States Section of the Combustion Institute, Laramie, WY, USA. 2–3 October 2017.
23. Tejas C. Mulky* and **Kyle E. Niemeyer**. “Preliminary analysis of smoldering combustion in cellulose and hemicellulose mixtures.” 2017 Fall Technical Meeting of the Western States Section of the Combustion Institute, Laramie, WY, USA. 2–3 October 2017.
22. **Kyle E. Niemeyer** and Paul G. Constantine. “Active subspace analysis of chemical kinetic models for combustion.” SIAM Workshop on Parameter Space Dimension Reduction (DR17), Pittsburgh, PA, USA. 9–10 July 2017.
21. Bryan W. Weber and **Kyle E. Niemeyer**. “ChemKED: A human- and machine-readable data standard for chemical kinetics experiments.” 10th International Conference on Chemical Kinetics, Chicago, IL, USA. 22–25 May 2017. <https://doi.org/10.6084/m9.figshare.5033417>
20. Bryan W. Weber and **Kyle E. Niemeyer**. “Introducing ChemKED: A human- and machine-readable data standard for chemical kinetics experiments.” 10th National Combustion Meeting, College Park, MD, USA. 23–26 April 2017. <https://doi.org/10.6084/m9.figshare.5082709>
19. **Kyle E. Niemeyer**, Morgan Mayer[†], Sai Krishna Sirumalla, and Richard West. “Assessing the impact of reaction rate variation on autoignition model performance: butanol.” 10th National Combustion Meeting, College Park, MD, USA. 23–26 April 2017. <https://doi.org/10.6084/m9.figshare.4924760>
18. Aaron J. Fillo*, Jason Schlup, Guillaume Blanquart, and **Kyle E. Niemeyer**. “Assessing the importance of multicomponent transport properties using direct numerical simulations of premixed, turbulent flames.” 10th National Combustion Meeting, College Park, MD, USA. 23–26 April 2017.
17. Matthew F. Zaiger*, David L. Blunck, and **Kyle E. Niemeyer**. “Simulating interactions of detonation, ionization chemistry, and magnetohydrodynamics.” 10th National Combustion Meeting, College Park, MD, USA. 23–26 April 2017.
16. Andrew Alferman* and **Kyle E. Niemeyer**. “Investigating stiffness detection metrics for chemical kinetics.” 10th National Combustion Meeting, College Park, MD, USA. 23–26 April 2017.
15. Daniel Magee* and **Kyle E. Niemeyer**. “An initial investigation of the performance of GPU-based swept time-space decomposition.” AIAA SciTech 2017, Grapevine, TX, USA. 9–13 January 2017. [arXiv:1612.02495](https://arxiv.org/abs/1612.02495) [physics.comp-ph]
14. **Kyle E. Niemeyer**. “An autoignition performance comparison of chemical kinetics models for *n*-heptane.” Spring 2016 Meeting of the Western States Section of the Combustion Institute, Seattle, WA, USA. 21–22 March 2016. Paper 139KI-0028. <https://doi.org/10.6084/m9.figshare.3120724.v1>
13. **Kyle E. Niemeyer**, Nicholas J. Curtis, and Chih-Jen Sung. “Initial investigation of pyJac: an analytical Jacobian generator for chemical kinetics.” Fall 2015 Meeting of the Western States Section of the Combustion Institute, Provo, UT, USA. 5–6 October 2015. Paper 134CK-0019. <https://doi.org/10.6084/m9.figshare.2075515.v1>



12. Shyam Menon, Himakar Ganti*, **Kyle Niemeyer**, and Christopher Hagen. “Effect of natural gas conditions on combustion characteristics and overall performance of a novel bimodal internal combustion engine.” 9th U.S. National Combustion Meeting, Cincinnati, OH, USA. 17–20 May 2015. Paper 114IC-0407.
11. **Kyle E. Niemeyer**, Christopher L. Hagen, and William J. Cannella. “A new fuel index for LTC engines based on operating envelopes in light-duty driving cycle simulations: primary reference fuels.” 2014 Western States Section of the Combustion Institute Spring Meeting, Pasadena, CA, USA. 24–25 March 2014. Paper 14S-20.
10. **Kyle E. Niemeyer** and Chih-Jen Sung. “Reduced mechanisms for gasoline surrogates valid at engine conditions.” 10th US National Combustion Meeting, Park City, UT, USA. 19–22 May 2013. <https://doi.org/10.6084/m9.figshare.3384967>
9. **Kyle E. Niemeyer** and Chih-Jen Sung. “Accelerating reactive-flow simulations using graphics processing units.” 51st AIAA Aerospace Sciences Meeting, Grapevine, TX, USA. 7–10 January 2013. <https://doi.org/10.2514/6.2013-371>
8. **Kyle E. Niemeyer** and Chih-Jen Sung. “Recent Progress and Challenges in Exploiting Graphics Processors for Aeropropulsion Simulations.” Fourth International Symposium on Jet Propulsion and Power Engineering, Xi’an, China. 10–12 September 2012. <https://doi.org/10.6084/m9.figshare.3384970>
7. **Kyle E. Niemeyer**, Chih-Jen Sung, Catalin G. Fotache, and Jeremiah C. Lee. “Turbulence-chemistry closure method using graphics processing units: a preliminary test.” 7th Fall Technical Meeting of the Eastern States Section of the Combustion Institute, Storrs, CT, USA. 9–12 March 2011. Paper C02. <https://doi.org/10.6084/m9.figshare.3384964>
6. **Kyle E. Niemeyer** and Chih-Jen Sung. “Mechanism reduction strategies for multi-component gasoline surrogate fuels.” 7th National Combustion Meeting, Atlanta, GA, USA. 20–23 March 2011. Paper 1A15. <https://doi.org/10.6084/m9.figshare.3384973>
5. **Kyle E. Niemeyer** and Chih-Jen Sung. “DRGEP-based mechanism reduction strategies: graph search algorithms and skeletal primary reference fuel mechanisms.” 49th AIAA Aerospace Sciences Meeting, Orlando, FL, USA. 4–7 January 2011. AIAA 2011-508. <https://doi.org/10.2514/6.2011-508>
4. Chih-Jen Sung and **Kyle E. Niemeyer**. “Skeletal mechanism generation of surrogate jet fuels for aeropropulsion modeling”. 2nd International Symposium on Computational Mechanics in conjunction with the 12th International Conference on the Enhancement and Promotion of Computational Methods in Engineering and Science, Hong Kong, China. 29 November–3 December 2009. *AIP Conference Proceedings*, 1233 (2010): 1412–1417. <https://doi.org/10.1063/1.3452113>
3. **Kyle E. Niemeyer**, Mandhapati P. Raju, and Chih-Jen Sung. “Skeletal Mechanism Generation of Surrogate Fuels Using Directed Relation Graph with Error Propagation and Sensitivity Analysis”. 45th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit, Denver, CO, USA. 2–5 August 2009. AIAA 2009-5495. <https://doi.org/10.2514/6.2009-5495>

2. **Kyle E. Niemeyer**, Mandhapati P. Raju, and Chih-Jen Sung. “Skeletal Mechanism Generation for Surrogate Fuels Using Directed Relation Graph with Error Propagation and Sensitivity Analysis”. 6th National Combustion Meeting, Ann Arbor, MI, USA. 17–20 May 2009. Paper 11F1. <https://doi.org/10.6084/m9.figshare.3384976>
1. Craig R. Slyfield, Ryan E. Tomlinson, Evgeniy V. Tkachenko, **Kyle E. Niemeyer**, Grant J. Steyer, David L. Wilson, and Christopher J. Hernandez. “Sub-micron 3D Fluorescent Imaging and Visualization of Remodeling Cavities in Cancellous Bone”. ASME Summer Bioengineering Conference, Marco Island, FL, USA. 25–29 June 2008. <https://doi.org/10.1115/SBC2008-193099>
23. Phillip Mestas[†] and **Kyle E. Niemeyer**. “Comparing mechanism reduction methods with pyMARS: Python-based Model Automatic Reduction Software.” 17th International Conference on Numerical Combustion, Aachen, Germany. 6–8 May 2019.
22. W. Jayani Jayasuriya^{*}, Tejas C. Mulky^{*}, and **Kyle E. Niemeyer**. “Modeling smoldering of real fuels in wildland fires.” 17th International Conference on Numerical Combustion, Aachen, Germany. 6–8 May 2019.
21. Paige Lorson^{*}, Nicholas Curtis, and **Kyle E. Niemeyer**. “ODE integrators suitable for chemical kinetics on GPUs and other accelerators.” 17th International Conference on Numerical Combustion, Aachen, Germany. 6–8 May 2019.
20. Emily F. Klee^{*}, Peter E. Hamlington, **Kyle E. Niemeyer**. “Reducing biogeochemical models using computational singular perturbation.” SIAM Conference on Computational Science and Engineering (CSE19), Spokane, WA, USA. 25 February–1 March 2019.
19. **Kyle E. Niemeyer**, Andrew Alferman^{*}, Paige Lorson^{*}, Emily Klee^{*}, Nicholas Curtis, and Chih-Jen Sung. “Software Library for Accelerating Chemical Kinetics on Hybrid Architectures: the SLACKHA Project.” SIAM Conference on Computational Science and Engineering (CSE19), Spokane, WA, USA. 25 February–1 March 2019.
18. Daniel J. Magee^{*} and **Kyle E. Niemeyer**. “hSweep: Applying the swept rule for explicit PDE solutions to heterogeneous clusters.” 30th International Conference on Parallel Computational Fluid Dynamics (Parallel CFD 2018), Indianapolis, IN, USA. 14–17 May 2018.
17. Luz Pacheco^{*}, Katherine Smith, Peter Hamlington, and **Kyle E. Niemeyer**. “Assessing uncertainty in the turbulent upper-ocean mixed layer using an unstructured finite-element solver.” 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, USA. 19–21 November 2017.
16. Aaron J. Fillo^{*} and **Kyle E. Niemeyer**. “LIB LAB the Library Laboratory: hands-on multimedia science communication.” 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, USA. 19–21 November 2017.
15. Peter Hamlington, Katherine Smith, **Kyle E. Niemeyer**, Baylor Fox-Kemper, and Nikki Lovenduski. “Effects of Small-Scale Turbulent Mixing on Upper Ocean Carbonate Chemistry.” 70th Annual Meeting of the APS Division of Fluid Dynamics, Denver, CO, USA. 19–21 November 2017.
14. **Kyle E. Niemeyer**, Arfon M. Smith, Lorena A. Barba, George Githinji, Melissa Gymrek, Kathryn Huff, Daniel S. Katz, Christopher Madan Abigail Cabunoc Mayes,

- Kevin M. Moerman, Pjotr Prins, Karthik Ram, Ariel Rokem, Tracy K. Teal, Roman Valls Guimera, Jacob T. Vanderplas. “Introducing JOSS: the Journal of Open Source Software.” 2017 Scientific Computing with Python Conference, Austin, TX, USA. 12–14 July 2017. <https://doi.org/10.6084/m9.figshare.5208151>
13. Andrew Alferman^{*} and **Kyle E. Niemeyer**. “Investigating stiffness detection metrics for chemical kinetics.” 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017.
 12. Matthew F. Zaiger^{*}, David L. Blunck, and **Kyle E. Niemeyer**. “Simulating interactions of detonation, ionization chemistry, and magnetohydrodynamics.” 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017.
 11. Aaron J. Fillo^{*} and **Kyle E. Niemeyer**. “Impact of chemical kinetic model reduction on premixed multi-dimensional flame characteristics.” 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017.
 10. Parker Clayton[†] and **Kyle E. Niemeyer**. “pyMARS: An open software package for chemical kinetics model reduction.” 16th International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017.
 9. Nicholas J. Curtis, Chih-Jen Sung, Christopher P. Stone, and **Kyle E. Niemeyer**. “Performance of stiff and non-stiff integrators on heterogeneous architectures.” 16th International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017. <https://doi.org/10.6084/m9.figshare.4816708>
 8. Bryan W. Weber and **Kyle E. Niemeyer**. “Introducing ChemKED: a new human- and machine-readable data standard for chemical kinetics experiments.” 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017. <https://doi.org/10.6084/m9.figshare.4818448>
 7. **Kyle E. Niemeyer**, Raymond L. Speth, Bryan W. Weber, and Richard West. “Encouraging modern software development practices for combustion.” 2017 SIAM International Conference on Numerical Combustion, Orlando, FL, USA. 3–5 April 2017. <https://doi.org/10.6084/m9.figshare.4813984>
 6. Andrew Alferman^{*} and **Kyle E. Niemeyer**. “Investigating stiffness detection metrics for chemical kinetics ODEs.” 2017 SIAM Conference on Computational Science and Engineering (CSE17), Atlanta, GA, USA. 27 February–3 March 2017. <https://doi.org/10.6084/m9.figshare.4729321>
 5. Nicholas J. Curtis, Chih-Jen Sung, and **Kyle E. Niemeyer**. “SIMD-acceleration of chemical source term Evaluation via Python.” 2017 SIAM Conference on Computational Science and Engineering (CSE17), Atlanta, GA, USA. 27 February–3 March 2017. <https://doi.org/10.6084/m9.figshare.4736254>
 4. Christopher S. Minar^{*} and **Kyle E. Niemeyer**. “Investigation of GPU-based immersed boundary method solvers with direct forcing.” 28th International Conference on Parallel Computational Fluid Dynamics, Kobe, Japan. 9–12 May 2016. <https://doi.org/10.6084/m9.figshare.3365383>

3. **Kyle E. Niemeyer**. “Using GPUs to accelerate nonstiff and stiff chemical kinetics in combustion simulations.” 15th International Conference on Numerical Combustion, Avignon, France. 19–22 April 2015.
2. Christopher P. Stone and **Kyle E. Niemeyer**. “Faster Kinetics: Accelerate Your Finite-Rate Combustion Simulation with GPUs.” GPU Technology Conference 2014, San Jose, CA, USA. 24–27 March 2014.
1. **Kyle E. Niemeyer** and Chih-Jen Sung. “Accelerating stiff chemical kinetics in combustion simulations using GPUs.” 14th International Conference on Numerical Combustion, San Antonio, TX, USA. 8–10 April 2013.

OTHER PAPERS


7. Daniel S. Katz, **Kyle E. Niemeyer**, and Arfon M. Smith. 2018. “Publish Your Software: Introducing the *Journal of Open Source Software (JOSS)*.” *Computing in Science & Engineering*, 20(3):84–88.
 <https://doi.org/10.1109/MCSE.2018.03221930>
6. **Kyle E. Niemeyer**, Jacqueline O’Connor, W. Ethan Eagle, C. Franklin Goldsmith, Nicole J. Labbe, and Richard H. West. 2018. “Workshop report: Sustaining the combustion research community: ensuring the field doesn’t burn out.”
 <https://doi.org/10.5281/zenodo.1148931>
5. Daniel S. Katz, **Kyle E. Niemeyer**, Sandra Gesing, Lorraine Hwang, Wolfgang Bangerth, Simon Hettrick, Ray Idaszak, Jean Salac, Neil Chue Hong, Santiago Núñez-Corrales, Alice Allen, R. Stuart Geiger, Jonah Miller, Emily Chen, Anshu Dubey, Patricia Lago. 2017. “Report on the Fourth Workshop on Sustainable Software for Science: Practice and Experiences (WSSSPE4).”
 [arXiv:1705.02607](https://arxiv.org/abs/1705.02607) [cs.SE]
4. **Kyle E. Niemeyer**. 2017. “Open science and the future university researcher.”
 <https://doi.org/10.17605/OSF.IO/2ZCJ3>
3. Daniel S. Katz, **Kyle E. Niemeyer**, and Arfon M. Smith. 2016. “Strategies for biomedical software management, sharing, and citation.” *PeerJ Preprints* 4:e2640v1.
 <https://doi.org/10.7287/peerj.preprints.2640v1>
2. Daniel S. Katz, **Kyle E. Niemeyer**, Arfon M. Smith, William L. Anderson, Carl Boettiger, Konrad Hinsén, Rob Hooft, Michael Hucka, Allen Lee, Frank Löffler, Tom Pollard, and Fernando Rios. 2016. “Software vs. data in the context of citation.” *PeerJ Preprints* 4:e2630v1.
 <https://doi.org/10.7287/peerj.preprints.2630v1>
1. Devin Berg, **Kyle Niemeyer**, and Luciano Fleischfresser. 2016. “[Editorial] Open Publishing in Engineering.” *The Journal of Open Engineering*,
 <https://doi.org/10.21428/12302>

POSTER PRESENTATIONS

10. **Kyle E. Niemeyer** and Bryan W. Weber. “PyKED: a Python-based tool supporting data analysis and experimental reproducibility in combustion.” 17th Annual Scientific Computing with Python Conference (SciPy 2018), Austin, TX, USA. 9–15 July 2018.
<https://doi.org/10.5281/zenodo.1312239>
9. Arfon Smith, Lorena A. Barba, George Githinji, Melissa Gymrek, Kathryn Huff, Daniel S. Katz, Christopher Madan, Abigail Cabunoc Mayes, Kevin M. Moerman,

- Kyle E. Niemeyer**, Pjotr Prins, Karthik Ram, Ariel Rokem, Tracy Teal, and Jake Vanderplas. “The Journal of Open Source Software.” SIAM Computational Science & Engineering 2017 (CSE17), Atlanta, GA, USA. 27 February–3 March 2017. <https://doi.org/10.6084/m9.figshare.4688911>
8. **Kyle E. Niemeyer**, Arfon Smith, and Daniel S. Katz. “Software citation principles for credit and reuse.” SIAM Computational Science & Engineering 2017 (CSE17), Atlanta, GA, USA. 27 February–3 March 2017. <https://doi.org/10.6084/m9.figshare.4688908>
 7. Christopher Minar* and **Kyle E. Niemeyer**. “GPU Based Fluid Structure Interaction.” GPU Technology Conference 2016, San Jose, CA, USA. 4–7 April 2016. Poster P6241.
 6. **Kyle E. Niemeyer** and Chih-Jen Sung. “SLACKHA: Software Library for Accelerating Chemical Kinetics on Hybrid Architectures.” 2016 NSF SI2 PI Workshop, Arlington, VA, USA. 16 February 2016. <https://doi.org/10.7921/G09884XX>
 5. Christopher Minar* and **Kyle E. Niemeyer**. “Development of a GPU-Based Computational Fluid Dynamics Modeling Tool for Design & Optimization of Wave Energy Converters.” Oregon State University Engineering Research Expo, Portland, OR, USA. 4 March 2015.
 4. **Kyle E. Niemeyer** and Chih-Jen Sung. “Strategies for accelerating combustion simulations with GPUs.” 35th International Symposium on Combustion, San Francisco, CA, USA. 4–8 August 2014. <https://doi.org/10.6084/m9.figshare.1128029>
 3. **Kyle E. Niemeyer**, Shane Daly*, William Cannella, and Christopher L. Hagen. “A new fuel index for LTC engines based on operating envelopes in light-duty driving cycle simulations.” 35th International Symposium on Combustion, San Francisco, CA, USA. 4–8 August 2014. <https://doi.org/10.6084/m9.figshare.1128030>
 2. **Kyle E. Niemeyer** and Chih-Jen Sung. “Mechanism reduction strategies for gasoline surrogate fuels.” 24th International Colloquium on the Dynamics of Explosions and Reactive Systems, Taipei, Taiwan. 28 July–2 August 2013.
 1. **Kyle E. Niemeyer** and Chih-Jen Sung. “GPU-based explicit integration algorithms for accelerating chemical kinetics in CFD simulations.” 24th International Colloquium on the Dynamics of Explosions and Reactive Systems, Taipei, Taiwan. 28 July–2 August 2013.

INVITED TALKS

12. “Background and recent progress in using detailed chemical kinetics for numerical combustion modeling,” Department of Aerospace Engineering, Texas A&M University. 12 October 2018.
11. “Best practices for sustainable and open research software in computational research,” CGU, CSSS, CIG, ES-SSA, & CSAFM 2018 Joint Meeting, Niagara Falls, Ontario. 11 June 2018.
 <https://doi.org/10.5281/zenodo.1286959>
10. “Incorporating detailed chemistry in reactive-flow simulations by exploiting system stiffness and processor architecture,” Boulder Fluid and Thermal Sciences Seminar Series, University of Colorado, Boulder. 22 March 2018.

9. “New community standards and open tools for chemical kinetics,” Combustion Chemistry Centre, National University of Ireland, Galway. 29 August 2017.
8. “Enabling next-generation combustion simulations by intelligent integration,” Institute for Computational Engineering and Sciences seminar, University of Texas at Austin. 26 July 2017.
7. “Software in science and engineering research: the case for open source and proper citation,” Oregon State University Research Computing Seminar Series. 8 May 2017. <https://doi.org/10.6084/m9.figshare.4985570>
6. “Good-Enough Practices for Computing in Research,” OSU MIME Design Seminar Series. 18 November 2016.
5. “Novel modeling tools for next-generation combustion,” OSU Applied Mathematics and Computation Seminar. 28 October 2016.
4. “Making effective use of graphics processing units (GPUs) in computations,” Oregon State University Research Computing Seminar Series. 7 March 2016.
3. “Best Research Practices Part 2: Time Management and Effective Communication,” OSU MIME Design Seminar Series. 16 October 2015.
2. “Novel computational modeling tools for next-generation combustion,” Invited talk, University of Utah. 2 October 2015.
1. “Graphics processing units (GPUs) as tools for accelerating computational design and optimization,” OSU MIME Design Seminar Series. 23 January 2015.

EXTERNAL
FUNDING &
SUPPORT

Better Scientific Software (BSSw) Fellowship (ORNL; prime sponsor DOE). PI: **Kyle Niemeyer**. January 2019–March 2020. Total funding \$31,533.

LBNL subcontract 7449593 (under DOE-BETO), “Support of the Feedstock to Function Tool (F2FT) Project.” PIs: **Kyle Niemeyer** and Bryony DuPont. December 2018–September 2021. Total funding \$224,361.

NSF CBET-1901570, “Support for Workshop and Mentoring of Junior Researchers at the US National Combustion Meeting.” PIs: Jacqueline O’Connor (Penn State), Richard West (Northeastern), **Kyle Niemeyer**, and Nicole Labbe (CU Boulder). January 2019–December 2019. Total funding \$27,838.

NSF CBET-1761683, “Collaborative Research: CDS&E: Leveraging hardware acceleration for accurate particle dynamics in turbulent flows.” PIs: Guillaume Blanquart (Caltech) and **Kyle Niemeyer**. August 2018–July 2021. Total funding \$550,000 (OSU portion: \$261,412).

NSF OAC-1831393, “2018 Software Infrastructure for Sustained Innovation (SI2) Principal Investigators Workshop.” PIs: Francis Timmes (Arizona State), Sandra Gesing (Notre Dame), **Kyle Niemeyer**, Rafael Ferreira da Silva (USC), and Paul Bauman (Buffalo). June 2018–May 2019. Total funding: \$37,401.

NSF CBET-1733968, “Workshop: Building a sustainable combustion research community”. PIs: **Kyle Niemeyer**, Nicole Labbe (CU Boulder), Jacqueline O’Connor (Penn

State), and Richard West (Northeastern). March 2017–December 2017. Total funding: \$15,195. <https://doi.org/10.6084/m9.figshare.4620163>

Energy Industry Sponsor, “Further Development of Fuel Autoignition Index Based on Infrared Absorption.” PIs: Christopher Hagen and **Kyle Niemeyer**. March 2017–June 2018. Total funding: \$100,000 (my portion: \$10,966).

NSF ACI-1702722, “2017 Software Infrastructure for Sustained Innovation (SI2) Principal Investigator Workshop.” PIs: Ganesh Gopalakrishnan (U. Utah), Matthew Turk (UIUC), Yung-Hsiang Lu (Purdue), Matthew Knepley (Rice), and **Kyle Niemeyer**. December 2016–November 2017. Total funding: \$94,993.

NSF ACI-1648293, “The 4th Workshop on Sustainable Software for Science: Best Practices and Experiences (WSSSPE4).” PIs: Daniel Katz (UIUC), Gabrielle Allen (UIUC), and **Kyle Niemeyer**. August 2016–July 2017. Total funding: \$40,000.

NVIDIA Tesla K40 GPU Hardware Donation. March 2016. Estimated value: \$3000.

SERDP RC-2651, “Ignition, Propagation, and Emissions of Smoldering Combustion: Experimental Analysis and Physics Based-Modeling.” PIs: David Blunck, **Kyle Niemeyer**; Bret Butler and Wei Min Hao (US Forest Service). May 2016–April 2021. Total funding: \$2,059,094 (my portion: \$468,387).

NASA NNX15AU66A, “Swept time-space domain decomposition rule for breaking the latency barrier.” PIs: Qiqi Wang (MIT), **Kyle Niemeyer**, and David Gleich (Purdue University). September 2015–August 2018. Total funding: \$696,444 (my portion: \$273,454).

Energy Industry Sponsor, “Advanced Internal Combustion Engine Fuel Modeling and Testing Phase II.” PIs: Christopher Hagen and **Kyle Niemeyer**. September 2015–August 2016. Total funding: \$142,178 (my portion: \$42,516).

NSF ACI-1535065, “Collaborative Research: SI2-SSE: An intelligent and adaptive parallel CPU/GPU co-processing software library for accelerating reactive-flow simulations.” PIs: **Kyle Niemeyer** and Chih-Jen Sung (University of Connecticut). September 2015–August 2018. Total funding: \$528,644 (OSU portion: \$314,287).

– *REU Supplement*: Summer 2016, \$7200.

– *REU Supplement*: Summer 2017, \$14400.

– *REU Supplement*: Summer 2018, \$14400.

DOE/NETL DE-FE0025822, “Pulse detonation engine for advanced oxy-combustion of coal-based fuels.” PIs: David Blunck, Sourabh Apte, and **Kyle Niemeyer**. September 2015–March 2017. Total funding: \$874,750 (my portion: \$169,500).

Oregon BEST, Commercialization Program “Arc Position Sensing Technology Commercialization,” PI: **Kyle Niemeyer**. June 2015–December 2016. Total funding: \$149,975.

NVIDIA Tesla K40 GPU Hardware Donation. January 2015. Estimated value: \$3000.

NSF Center for e-Design, Lucid Energy/Oregon BEST. “A tool to estimate the electrical energy generated from turbines inserted in fresh water pipes,” PIs: Christopher Hoyle and **Kyle Niemeyer**. January 2015–December 2015. Total funding: \$30,000.

TEACHING
EXPERIENCE

Oregon State University

ME 599, Software Development for Engineering Research (graduate)
Project-based graduate class aimed at advancing computational research skills.
—Spring 2018, Spring 2019

ME 373, Mechanical Engineering Methods (undergraduate)
Junior-level course covering analytical and numerical methods for solving ordinary and partial differential equations.
—Winter 2015–2017, Fall 2017, Winter 2019

ME 599, Advanced Combustion (graduate)
Advanced graduate-level course on fundamental principles of combustion. Co-taught with David Blunck.
—Fall 2016

ME 461/561, Gas Dynamics (undergraduate/graduate)
Combined senior undergraduate and graduate course on compressible fluid flows.
—Fall 2016–2018

MIME 101, Introduction to MIME (undergraduate)
Freshman-level course providing an overview of mechanical, industrial, and manufacturing engineering as well as academic success skills.
—Fall 2015

ME 331, Introductory Fluid Mechanics (undergraduate)
Junior-level course introducing concepts and applications of fluid mechanics and dimensional analysis.
—Fall 2013, Fall 2014

ESE 497, MIME Capstone Design (undergraduate)
Senior-level design capstone course for Energy Systems Engineering (ESE) students, covering real-world product design, project management, and professional communication skills.
—Fall 2014

Case Western Reserve University (as teaching assistant)

EMAE 350, Mechanical Engineering Analysis (undergraduate)
Junior-level course on mathematical methods (analytical and numerical) used in mechanical engineering, with a focus on ordinary and partial differential equations.
—Fall 2007, Fall 2009, Fall 2010

EMAE 359, Aero/Gas Dynamics (undergraduate)
Junior-level course on incompressible and compressible flow theory and applications.

—Spring 2010

EMAE 376, Aerostructures (undergraduate)

Junior-level course on solid mechanics of thin-walled aerospace structures, including introduction to finite element methods.

—Spring 2008

ADVISING
EXPERIENCE

PhD students supervised

- Paige Lorson, Mechanical Engineering
- Anthony Walker, Mechanical Engineering
- W. Jayani Jayasuriya, Mechanical Engineering
- Emily Klee, Mechanical Engineering
- Aaron Fillo, Mechanical Engineering

MS students supervised

- Morgan Mayer, Mechanical Engineering
- Khang Tran, Mechanical Engineering (co-advised with Chris Hagen)
- Matthew Zaiger, Mechanical Engineering
- Tejas Mulky, “[Computational study of smoldering combustion in cellulose and hemicellulose mixtures](#),” Mechanical Engineering (Sep. 2018)
- Luz Pacheco, “Assessing uncertainty in the turbulent upper-ocean mixed layer using an unstructured finite-element solver,” Mechanical Engineering (Jun. 2018)
- Andrew Alferman, “[Evaluating stiffness metrics for predicting the cost of chemical kinetics integration](#),” Mechanical Engineering (Jun. 2018)
- Daniel Magee, “[Swept time-space domain decomposition on GPUs and heterogeneous computing systems](#),” Mechanical Engineering (Jun. 2018)
- Himakar Ganti, Mechanical Engineering (Jun. 2017)
- Miguel Soler, “[Computational Investigation on the Effects of Arc Location in Vacuum Arc Remelting](#),” Mechanical Engineering (Dec. 2016)
- Christopher Minar, “[GPU-Based Fluid-Structure Interaction using Immersed Boundary Methods](#),” Mechanical Engineering (Dec. 2016)
- Shane Daly, “[Chemometrics-based Approach for Predicting Low Temperature Combustion Engine Fuel Performance](#),” Mechanical Engineering; co-advised with Christopher Hagen (Sep. 2015)

Honors College BS students advised

- Phillip Mestas, Computer Science (Feb. 2017–present)
- Morgan Mayer, Chemical Engineering, “[Comparing the autoignition performance of chemical kinetic models for toluene using data extracted from the literature](#)” (May 2019)

Undergraduate students supervised • Maria Politi, Chemical Engineering (Winter 2018–present) • Logan Fairman, Mechanical Engineering (Winter 2018–present) • Dana Marti, Mechanical Engineering (Winter–Spring 2018) • Braam Beresford, Electrical and

Computer Engineering (Winter–Spring 2018) • Kenny Warren, BioResource Research/Bioenergy (June 2016–Dec. 2017) • Dallas Nelson, Mechanical Engineering (Summer 2017) • Jimwel Aguinaldo, Computer Science (Feb. 2017–June 2017) • Parker Clayton, Mechanical Engineering (Feb. 2016–June 2017) • Brian Butcher, Mechanical Engineering (Feb.–June 2016)

Visiting students supervised

Daiki Ichinokiyama, MS student at University of Tsukuba, Japan (Oct. 2015–Feb. 2016)

PhD Committee Member • Derek Bean, Mechanical Engineering • Jonathan Bonebrake, Mechanical Engineering • Shashank Karra, Mechanical Engineering • Mick Carter, Mechanical Engineering • Matt Harrison, Mechanical Engineering • Zachary Taie, Mechanical Engineering • Shane Daly, Mechanical Engineering (Jun. 2018)

MS committee member • Daniel Cowan, Mechanical Engineering • Nathan Schorn, Mechanical Engineering (Jun. 2019) • Tyler Hudson, Mechanical Engineering (Nov. 2018) • Annalise Miller, Mechanical Engineering (Jun. 2018) • Jonathan Bonebrake, Mechanical Engineering (May 2018) • Paul Armatis, Mechanical Engineering (Nov. 2017) • Pavel Zaytsev, Robotics (Jun. 2017) • Elliot Jackson, Electrical Engineering (Jun. 2017) • Sean Brown, Mechanical Engineering (Jun. 2017) • Aaron J. Fillo, Mechanical Engineering (Dec. 2016) • Eric Walters, Mechanical Engineering (Jul. 2016) • Eric Zeuthen, Mechanical Engineering (Feb. 2016) • Sebastian Okhovat, Mechanical Engineering (Dec. 2015)

Honors BS committee member • Ian Walters, Mechanical Engineering (May 2016)

Graduate Council Representative • Kolton Mahr, MS Civil Engineering/Wood Science (June 2019) • Kofi Sarfo, PhD Chemical Engineering • Rafid Almahdi, PhD Computer Science • Ben McCamish, PhD Computer Science (Mar. 2019) • Matt O'Banion, PhD Civil Engineering (Oct. 2017) • Sheng Chen, PhD Computer Science (Mar. 2017) • Adem Zaid, MS Computer Science (Mar. 2017) • Ajinkya Patil, MS Computer Science (Aug. 2016) • Alexander Clucas, MS Computer Science (June 2016) • Thanh Huynh, MS Civil Engineering/Wood Science (June 2016) • Kendall Bailey, MS Computer Science (Dec. 2015) • Ben McCamish, MS Computer Science (June 2015)

PROFESSIONAL SERVICE

Journal Editorial Positions

Associate Editor-in-Chief, *The Journal of Open Source Software*, November 2018–present
Editor, *The Journal of Open Source Software*, May 2016–present
Editor, *The Journal of Open Engineering*, Apr. 2016–present
Associate Editor, *Journal of Open Research Software*, Feb. 2016–Apr. 2018

National/International Committee Participation

- Steering Council member, [Open Journals](#) (2018–present)
- Co-chair of Activities Committee, 17th Annual Scientific Computing with Python Conference (2018)
- Member of Scientific Python Work Group (workgroup of Python Software Foundation) (2017–present)

- US Sections of the Combustion Institute (USSCI) Early Career & Diversity Development Committee (Dec. 2017–present)
- Communication Chair, [Western States Section of the Combustion Institute](#) (Apr. 2017–present)
- Lead organizer, 2017 “[Workshop: Building a sustainable combustion research community](#)”
- Co-chair of organizing committee, 2017 NSF SI2 Principle Investigator Workshop
- Steering committee, [engrXiv](#) (eprint server for engineering)
- Organizing committee, 4th Workshop on Sustainable Software for Science: Practice and Experiences ([WSSSPE4](#))
- Co-chair, [FORCE11 Software Citation Working Group](#)

Conference Session Chair

- Minisymposium co-organizer and chair, 17th International Conference on Numerical Combustion, May 2019
- 11th US National Combustion Meeting, Mar. 2019
- 37th International Symposium on Combustion, Aug. 2018
- 70th Annual Meeting of the APS Division of Fluid Dynamics, Nov. 2017
- Western States Section of the Combustion Institute Fall Meeting, Oct. 2017
- 10th National Combustion Meeting, Apr. 2017
- 2017 SIAM International Conference on Numerical Combustion, Apr. 2017
- SIAM Computational Science & Engineering, Feb. 2017
- 28th International Conference on Parallel Computational Fluid Dynamics, May 2016
- Western States Section of the Combustion Institute Spring Meeting, Mar. 2016
- Western States Section of the Combustion Institute Fall Meeting, Oct. 2015

Invited Workshops & Panels

- NSF Workshop: Future Combustion Research to Mitigate Carbon Emissions, Hyattsville MD. 26–27 April 2017.
- Imagining Tomorrow’s University: Rethinking scholarship, education, and institutions for an open, networked era, Rosemont IL. 8–9 March 2017.
- CodeMeta Workshop: The Future of Software Metadata, Portland, OR. 15–17 April 2016.

Proposal/Award Referee

NSF Panel Reviewer: 2016, 2017, 2018, 2019 (2×)

Sloan Foundation: 2017, 2018

DOE Advanced Scientific Computing Research Leadership Computing Challenge: 2016, 2017

Air Force Summer Faculty Fellowship Program: 2015, 2016

National Defense Science and Engineering Graduate (NDSEG) Fellowship: 2015

Journal Reviewer

Proceedings of the Combustion Institute, Combustion and Flame, Journal of Computational Physics, Energy & Fuels, Fuel, Combustion Science & Technology, Combustion Theory & Modelling, Energy Conversion and Management, International Journal of Energetic Materials and Chemical Propulsion, SAE International Journal of Aerospace, International Journal of Chemical Reactor Engineering, Journal of Open Research Software, Journal of Open Source Software, Aerospace, Scientometrics, PeerJ Computer Science, International Journal of Hydrogen Energy, Frontiers in Mechanical Engineering, Heliyon

Conference Reviewer

SAE World Congress; ASME Internal Combustion Engine Fall (ICEF) Meeting; SAE 2014 International Powertrain, Fuels & Lubricants Meeting; ASME 2015 International Design Engineering Technical Conferences; ASME 2016 35th International Conference on Ocean, Offshore and Arctic Engineering; 15th Annual Scientific Computing with Python Conference (SciPy 2016); 16th Annual Scientific Computing with Python Conference (SciPy 2017); 17th Annual Scientific Computing with Python Conference (SciPy 2018); 18th Annual Scientific Computing with Python Conference (SciPy 2019)

Professional Affiliations

Member, The Combustion Institute
Senior Member, American Institute of Aeronautics and Astronautics (AIAA)
Professional Member, American Society of Mechanical Engineers (ASME)
Member, American Physical Society (APS)
Member, Society for Industrial and Applied Mathematics (SIAM)
Member, The Future of Research Communications and e-Scholarship (FORCE11)
Member, International Association of Wildland Fire

UNIVERSITY SERVICE

University Service

- Oregon State University Search Advocate (March 2019–)
- Research Council (July 2018–June 2021)

College of Engineering Service

- Search committee: High Performance Computing System Administrator (2019)
- Interdisciplinary Curriculum Committee (Jan. 2019–)

School Service

- Mechanical Engineering Undergraduate Program Committee (Fall 2017–present); co-chair (Nov. 2018–present)
- MIME Awards Committee (2015–present)
- Faculty search committee: Data Science & Engineering (2016–2017)
- Search committee: MIME School Operations Manager (2016–2017)

Outreach Efforts

- SIAM Computational Science & Engineering meeting Broader Engagements Mentor-Protege program: Feb.–March 2017, Feb. 2019

- “Discovering the Scientist Within” outreach event for middle-school girls; March 2015, March 2016, Feb. 2018, Feb. 2019
- “Explore Engineering Careers” speaker for Energy Systems Engineering (January 2015)

AWARDS &
HONORS

Better Scientific Software (BSSw) Fellow, 2019
 NSF Graduate Research Fellow, 2010–2013
 National Defense Science and Engineering Graduate Fellow, 2009–2012
 NSF Graduate Research Fellowship Program Honorable Mention, 2009
 The Case Alumni Association Prize for Achievement, 2009
 M. Roger Clapp Memorial Scholarship, Case Alumni Association, 2009
 Robert and Leona Garwin Award, Mechanical and Aerospace Engineering, 2008
 Outstanding Junior in Engineering Award, Case Western Reserve University, 2008
 Case Alumni Association Scholarship, 2007–2008
 Outstanding Sophomore in Engineering Award, Case Western Reserve University, 2007
 Presidential Scholar, Case Western Reserve University, 2005–2008
 Scholar-Athlete, Case Western Reserve University, 2005
 Tau Beta Pi (Ohio Alpha Chapter)