

Kara D. Peterman

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EDUCATION

- 2014 Ph.D., *Johns Hopkins University*
Major: Structural Engineering
Dissertation: *Behavior of Full-Scale Cold-Formed Steel Buildings under Seismic Excitations*,
Advisor: Ben Schafer
- 2011 MS, *Johns Hopkins University*
Major: Structural Engineering
Thesis: *Experiments on the Stability of Sheathed Cold-Formed Steel Studs under Axial Load and Bending*, Advisor: Ben Schafer
- 2009 BS, *Swarthmore College*
Major: Engineering, Minor: Statistics
Thesis: *Analysis and Design of Various Medieval Vaulting Technologies*, Advisor: Faruq Siddiqui

RECENT EMPLOYMENT

- 2016-present *Assistant Professor*, Dept. of Civil and Environmental Engineering, University of Massachusetts Amherst, Amherst, MA

Research Interests: As a member of the Structural Engineering and Mechanics (SEM) group, I focus on cold-formed and hot-rolled steel structures, and their behavior under service loads and extreme loads from natural hazards. Specifically, I use complex and large-scale experiments to shed light on system behavior, not otherwise captured by our design codes and specifications. I aim to provide the fundamental data which transform our understanding of how these systems share load and transmit forces to and from each other. As a researcher and an educator, I seek to motivate my students through modern engineering problems, and empower them to find solutions to the previously unanswerable.

- 2014-2016 *Postdoctoral Research Associate*, Dept. of Civil and Environmental Engineering, Northeastern University, Boston, MA

At Northeastern University, I worked with Professor and Chair Jerome F. Hajjar on a thermal break strategies project which aimed to provide comprehensive thermal and structural analysis along with full-scale structural testing to both design and validate new thermal break strategies for cladding systems in steel buildings. Our final report to the Charles Pankow Foundation may be downloaded here: <http://www.pankowfoundation.org/grants.cfm>

- 2009-2014 *Graduate Research Assistant*, Johns Hopkins University, Dept. of Civil Engineering, Baltimore, MD.

During my time at Johns Hopkins, I worked with Professor Benjamin W. Schafer as the experimental graduate research assistant on the NSF-funded CFS-NEES project, which aimed to enable the performance-based seismic design of multi-story cold-formed steel structures. As part of this effort, I conducted connection, shear wall, and two-story building tests (the latter were performed at the twin shake tables at the University of Buffalo SEES Laboratory). Reports, and my PhD dissertation are available here: <https://www.ce.jhu.edu/cfsnees/publications.php>

- 2009-2011 *Graduate Teaching Assistant*, Dept. of Civil Engineering, Johns Hopkins University, Baltimore, MD.

Courses TAed: Statics and Strength of Materials (200-level), Perspectives on the Evolution of Structures (100-level), Structural Stability (600-level)

FELLOWSHIPS, HONORS, and AWARDS

- 2018 *Innovation Fellow*, UMass Amherst, awarded to UMass Amherst faculty to attend the Winter 2018 Innovate@UMass Symposium, which focused on new instructional innovations and engagement mechanisms in the classroom (detailed below)
- 2017-2018 *Frank 5 Fellow*, Adeylotte Foundation of Swarthmore College, awarded to alumni under the age of 30 to advance the liberal arts.
- 2017 *NHERI Summer Institute Fellowship*, a fellowship awarded to attend the weeklong NSF NHERI (Natural Hazards Engineering Research Infrastructure) Summer Institute workshop
- 2012 *Departmental Service Award*, Dept. of Civil Engineering, Johns Hopkins University, awarded to one graduate student per year demonstrating exceptional service to the department
- 2010 *Departmental Teaching Award*, Dept. of Civil Engineering, Johns Hopkins University, awarded to one outstanding teaching assistant per year, based upon undergraduate reviews and nominations.
- 2010 *Creel Family Fellowship*, Whiting School of Engineering, Johns Hopkins University, a one year partial graduate scholarship
- 2009 *Robert S. Pond, Sr. Fellowship*, Whiting School of Engineering, Johns Hopkins University, a one year partial graduate scholarship

TEACHING EXPERIENCE / DEVELOPMENT

2016-present Department of Civil and Environmental Engineering, University of Massachusetts Amherst, Amherst, MA

Courses Instructed:

CEE 241/MIE 211 Strength of Materials (Fall 2016, 2017)
CEE 241A Strength of Materials Laboratory (Fall 2016, 2017)
CEE 542 Advanced Topics in Steel Design (Spring 2016, 2017)
CEE 693/4B Structural Engineering Seminar (Fall 2017, Spring 2018)

Winter 2018 Innovate@UMass Symposium

As an innovation Fellow, I attended a four day symposium organized and sponsored by the Institute for Teaching Excellence and Faculty Development, UMass Libraries and Information Technologies. The symposia focused on new ways of structuring student collaboration and teamwork, inclusion of media-creation projects in traditional curricula, and increasing student engagement through content delivery mechanisms.

2016-2017 Teaching Excellence and Faculty Development Flex Grant Awardee

Flex grant awarded to attend the 2016 International Center for Cold-Formed Steel Specialty Conference, to collaborate with other educators with the aim of improving the two-week cold-formed steel learning module I teach within CEE 542.

FUNDED PROJECTS

[3] Shake Table Testing of Cold-Formed Steel Diaphragms (\$100,000, PI). American Iron and Steel Institute, 2018-2019.

[2] Thermal Bridging in Cold-Formed Steel Walls (\$6,000, PI). Small Project Fellowship from the American Iron and Steel Institute, 2018.

[1] Stud Bearing on Concrete Slabs (\$40,000, PI with co-PI Zhanjie Li (SUNY Poly)). American Iron and Steel Institute, 2017-2018.

TRAVEL AWARDS

[6] Massachusetts Society of Professors Research Support Fund (\$1000 awarded for travel to Christchurch, NZ to attend the 2018 Steel Structures in Seismic Areas (STESSA) Conference).

[5] GEER Structural Wind Reconnaissance Team – Hurricane Harvey (~\$2500 awarded for travel to Corpus Christi, TX), National Science Foundation (NSF Award CMMI-1266418, PI Jonathan Bray, UC Berkeley), 2017.

[4] NHERI Summer Institute (\$2500 awarded for travel to San Antonio, TX), National Science Foundation via NHERI@UTSA, 2017.

[3] Wall of Wind Workshop (\$500 awarded to travel to Miami, FL), National Science Foundation via the NHERI Wall of Wind (WOW) Experimental Facility at Florida International University, 2016.

[2] UC San Diego Large High Performance Outdoor Shake Table (LH-POST) Workshop (\$500 awarded for travel to San Diego, CA), National Science Foundation via NHERI@UCSD, 2015.

[1] Engineering Sustainability (\$750 awarded to attend 2015 Engineering Sustainability Conference in Pittsburgh, PA), National Science Foundation, 2015.

ADVISING

PhD Students

Fani Derveni (started Fall 2017, in progress, co-advised with Simos Gerasimidis)

Hernan Castaneda (NEAGEP Fellow, started Fall 2017, in progress)

Abbas Joorabchian (started Fall 2016, in progress)

MS Students

Rita Kalo (started Fall 2017, in progress)

Visiting PhD Students

Federico Gusella (University of Florence, Florence, Italy, Nov. 2017-Apr. 2018)

Undergraduate Students:

Adrianna Early (BS exp. 2018)

Graduate Committee Member:

Trent Guihan (MS exp. 2019)

Gercelino Ramos (MS exp. 2018)

REU Student

Laura Rendos (Case Western, BS 2016 – advised while an REU student at NEES@UB)

PROFESSIONAL ACTIVITIES

2018 Reviewer, National Science Foundation Graduate Research Fellowship Program

Reviewed ~25 applications for the NSF GRFP, attended ~two four-hour virtual panels to determine fellowship recipients.

2017-present Member, Committee of Framing Standards (COFS), American Iron and Steel Institute

Responsible for voting on and reviewing technical additions and changes to the COFS Standards, which govern cold-formed steel framing design in the US.

2015-present Chair, Structural Stability Research Council, Thin-Walled Structures Task Group

Responsible for leadership and organization of Task Group; working towards creating and disseminating tools related to thin-walled structures; responsible for editing selected chapters of SSRC Guide. Created short course on cross-section stability (2018).

2009-present Member, Structural Stability Research Council

2015-present Affiliated Investigator, Cold-Formed Steel Research Consortium

2015-present Member (Educator), American Institute of Steel Construction

2014-present Associate Member, American Society of Civil Engineers (student member 2005-2014)

2014-present ASCE/SEI Thermal Bridging Task Group

2013-present Member, Cold-Formed Steel Engineering Institute (CFSEI)

2009 Engineer in Training (EIT, Pennsylvania). Eligible to take PE in CA, MA (June 2018)

Reviewer for:

ASCE Journal of Structural Engineering

Thin-Walled Structures

Journal of Constructional Steel Research

Journal of Earthquake Engineering

Engineering Structures

Soil Dynamics and Earthquake Engineering

UNIVERSITY AND DEPARTMENTAL SERVICE

2016-present Department Open House Committee (Chair beginning in 2018)

2018 Search Committee Co-Chair (with Eleni Christofa), Professor of Practice

Spring 2017 Interim faculty advisor, American Society of Civil Engineers UMass Student Chapter

2016-2017 Faculty advisor, Engineers for a Sustainable World

2016-present Undergraduate advising (including incoming freshmen during summer 2017)

COMMUNITY OUTREACH

2014-2016 Instructor, Center for STEM Research Young Scholars Program, UMass Amherst and Northeastern University

Developed and taught a day-long workshop in coordination with Andy Meyers (Assoc. Prof., Northeastern University) and the Massachusetts Wind Energy Center. Taught students about thin-walled tubular stability, conducted hands-on experiments on strengthening thin tubes under axial loads (Soda Can Lab), and introduced wind turbine design topics.

2013-2014 Mentor, STEM Achievement in Baltimore Elementary Schools (SABES), Johns Hopkins University

Participated in an after school STEM program for 5th grade students, responsible for guiding workshops and assisting students with projects once a week. Developed natural hazards-related learning modules for students to explore seismic loads on structures they designed. Culminated in designing and constructing a more resilient homeless shelter.

2013 Mentor, Women and Science and Engineering Program (WISE), Johns Hopkins University

Mentored and advised a high school student for a semester. The student spent approximately 6-8 hours a week at the university working on a final research project.

2009-2013 Volunteer, Maryland Wood Bridge Challenge

Maintained and re-designed test setup for testing balsa wood bridges made by area middle and high school students. Volunteered at competition.

2011 Volunteer, Expanding Your Horizons, Swarthmore College

Taught short courses on basic ideas in structural engineering to middle-school girls interested in STEM fields. Designed a concrete mix design with the participants, leading up to mixing concrete as part of the event.

PUBLICATIONS

Journal Papers *indicates student author

[11] **Peterman, K.D.**, Webster, M.D., D'Aloisio, J.A., and Hajjar, J.F., (2018) "Performance of continuous steel cladding details with fiber reinforced polymer shims" ASCE Journal of Structural Engineering <in preparation, submission by Oct. 2017>

[10] Webster, M.D., **Peterman, K.D.**, Der Ananian, O'Brian, S. J.D'Aloisio, J.A., and Hajjar, J.F., (2018) "Three-dimensional thermal modeling of steel cladding details with thermal break mitigation strategies" Engineering Sustainability <in preparation, submission by Oct. 2017>

[9] **Peterman, K.D.**, Webster, M.D., D'Aloisio, J.A., and Hajjar, J.F., (2018) "Cyclic performance of discrete steel cladding details with fiber reinforced polymer shims" ASCE Journal of Structural Engineering <in preparation, submission by Oct. 2017>

[8] **Peterman, K.D.**, Webster, M.D., D'Aloisio, J.A., and Hajjar, J.F., (2018) "Creep performance of fiber reinforced polymer fills in flatwise compression" Engineering Structures <in preparation, submission by Oct. 2017>

[7] Leng, J., **Peterman, K.D.**, Bian, G., Buonopane, S., Schafer, B.W., (2017) "Modeling Seismic Response of a Full-Scale Cold-formed Steel-Framed Building." Engineering Structures (accepted for publication 4 October 2017).

[6] **Peterman, K.D.**, Stehman, M., Madsen, R., Nakata, N., Buonopane, S., Schafer, B.W. (2016) "Sub-system level response of cold-formed steel buildings under seismic excitations." ASCE, Journal of Structural Engineering (DOI: 10.1061/(ASCE)ST.1943-541X.0001578)

[5] **Peterman, K.D.**, Stehman, M., Madsen, R., Nakata, N., Buonopane, S., Schafer, B.W. (2016) "Fundamental system level response of cold-formed steel buildings under seismic excitations." ASCE, Journal of Structural Engineering (DOI: 10.1061/(ASCE)ST.1943-541X.0001577)

[4] Bian, G., **Peterman, K.D.**, Torabian, S., Schafer, B.W. (2014) "Direct torsion of cold-formed steel lipped channels". Journal of Constructional Steel Research (DOI:

[3] **Peterman, K.D.**, Nakata, N., Schafer, B.W. (2014) "Hysteretic characterization of cold-formed steel stud-to-sheathing connections." Journal of Constructional Steel Research (DOI: 10.1016/j.jcsr.2014.05.019).

[2] Liu, P., **Peterman, K.D.**, Yu, C., Schafer, B.W. (2013) "Impact of construction details on OSB sheathed cold-formed steel framed shear walls." Journal of Constructional Steel Research (DOI: 10.1016/j.jcsr.2014.05.003).

[1] **Peterman, K.D.**, Schafer, B.W. (2013) "Sheathed Cold-Formed Steel Studs Under Axial and Lateral Load." ASCE, Journal of Structural Engineering (DOI: 10.1061/(ASCE)ST.1943-541X.0000966).

Technical Reports

[3] **Peterman, K.D.**, Kordas, J., Moradei, J., Coleman, K., Der Ananian, J., Webster, M.D., D'Aloisio, J.A., and Hajjar, J.F., (2017) "Thermal Break Strategies for Cladding Systems in Building Structures," Report to the Charles Pankow Foundation, Charles Pankow Foundation, Vancouver, WA, May 2017, 356 pp.

[2] **Peterman, K.D.**, B.W. Schafer (2013). "Hysteretic shear response of fasteners connecting sheathing to cold-formed steel studs" Research Report, CFS-NEES, RR04, January 2013, 38 pp. access at www.ce.jhu.edu/cfsnees

[1] Liu, P. **Peterman, K.D.**, Schafer, B.W. (2012). "Test Report on Cold-Formed Steel Shear Walls" Research Report, CFS-NEES, RR03, June 2012, 151 pp. access at www.ce.jhu.edu/cfsnees

Conference Papers

[21] *Early, A., Wood, R., **Peterman, K.D.**, "Behavior of cold-formed steel metal industrial buildings." Abstract accepted to International Center for Cold-Formed Steel Specialty Conference, paper due April 2018.

[20] *Joorabchian, A., **Peterman, K.D.**, "The impact of bearing conditions on the behavior of cold-formed steel stud assemblies" Abstract accepted to International Center for Cold-Formed Steel Specialty Conference, paper due April 2018.

[19] *Derveni, F., Gerasimidis, S., **Peterman, K.D.**, "Computational analysis of cold-formed steel podium structures under lateral loads" Abstract accepted to International Center for Cold-Formed Steel Specialty Conference, paper due April 2018.

[18] *Castaneda, H., Ayhan, D., Schafer, B.W., **Peterman, K.D.**, "Computational modeling of joist-to-ledger connections in cold-formed steel diaphragms". Abstract accepted to International Center for Cold-Formed Steel Specialty Conference, paper due April 2018.

[17] *Joorabchian, A., **Peterman, K.D.**, "Using photogrammetry-based imperfection measurement tools to determine the impact of corner radii imperfections on cold-formed steel member strength" Paper accepted to Structural Stability Research Council Annual Conference.

[16] *Derveni, F., Gerasimidis, S., **Peterman, K.D.**, "System stability of podium-type building structures subjected to lateral loads" Paper accepted to Structural Stability Research Council Annual Conference

[15] *Castaneda, H., Ayhan, D., Schafer, B.W., **Peterman, K.D.**, "Stability of wall-diaphragm connections in cold-formed steel framed buildings. Paper accepted to Structural Stability Research Council Annual Conference.

[14] **Peterman, K.D.**, Webster, M.D., D'Aloisio, J.A., Hajjar, J.F., (2018) "Cyclic Response of steel cladding details with fiber reinforced polymer shims." *Proceedings of the 9th International Conference on Steel Structures in Seismic Areas*. February 13-17, 2018, Christchurch, NZ.

[13] Hamel, S., and **Peterman, K.D.**, "Laboratory and Field Testing of Thermal Breaks in Building Envelope Assemblies." *Proceedings of the 8th European Conference on Steel and Composite Structures*, Copenhagen, Denmark, Sept. 13-15, 2017.

[12] **Peterman, K.D.**, Webster, M.D., D'Aloisio J.A., Hajjar, J.F., (2017). "End Plate Stability in Thermally-Improved Steel Cladding Details," *Proceedings of the Structural Stability Research Council Annual Stability Conference*, San Antonio, TX, March 21-24, 2017, Structural Stability Research Council, Chicago, IL.

- [11] **Peterman, K.D.**, Moradei, J., D'Aloisio, J.A., Webster, M.W., Hajjar, J.F. (2016) "Thermal and structural response of thermal break strategies in steel building systems." *Proceedings of CAMX 2016, Anaheim, CA. September 24-16, 2016*, American Composites Manufacturers Association.
- [10] **Peterman, K.D.**, Moradei, J., D'Aloisio, J. A., Webster, M. D., and Hajjar, J. F. (2016). "Thermal Break Strategies for Cladding Systems in Building Structures," *Proceedings of the Eighth International Workshop on Connections in Steel Structures*, Carter, C. J. and Hajjar, J. F. (eds.), Boston, Massachusetts, May 24-26, 2016, American Institute of Steel Construction, Chicago, Illinois.
- [9] **Peterman, K.D.**, Moradei, J., D'Aloisio, J.A., Webster, M.D., and Hajjar, J.F., (2015). "An Introduction to Thermal and Structural Response of Thermal Break Strategies in Steel Building Systems," *Proceedings of the Conference on Engineering Sustainability*, Pittsburgh, PA, April 19-21, 2015, University of Pittsburgh, Pittsburgh, PA.
- [8] **Peterman, K.D.**, Madsen, R.L., Schafer, B.W., (2014) "Experimental Seismic Behavior of the CFS-NEES Building: System-Level Performance of a Full-Scale Two-Story Light Steel Framed Building." 22nd International Specialty Conference on Cold-Formed Steel Structures, St. Louis, MO, November 2014.
- [7] **Peterman, K.D.**, Stehman, M.J.J., Buonopane, S.G., Nakata, N., Madsen, R.L., Schafer, B.W., (2014) "Seismic performance of full-scale cold-formed steel buildings." 10th National Conference on Earthquake Engineering, Anchorage, Alaska, July 2014.
- [6] **Peterman, K.D.**, Stehman, M.J.J., Buonopane, S.G., Nakata, N., Madsen, R.L., Schafer, B.W., (2014) "Stability performance of full-scale cold-formed steel buildings under seismic excitations." Structural Stability Research Council Annual Stability Conference, Toronto, ON, March 2014.
- [5] **Peterman, K.D.**, Bian, G., Schafer, B.W., (2014) "Experimental and computational analysis of direct torsion in cold-formed steel lipped channels." Structural Stability Research Council Annual Stability Conference, Toronto, ON., March 2014
- [4] Liu, P., **Peterman, K.D.**, Yu, C., Schafer, B.W. (2012) "Characterization of cold-formed steel shear wall behavior under cyclic loading for the CFS-NEES building." 21st International Specialty Conference on Cold-Formed Steel Structures - Recent Research and Developments in Cold-Formed Steel Design and Construction, St. Louis, MO, October 2012.
- [3] **Peterman, K.D.**, Nakata, N., Schafer, B.W., (2012) "Cyclic behavior of cold-formed steel stud-to-sheathing connections." World Conference on Earthquake Engineering, Lisbon, Portugal, September 24-28, 2012.
- [2] Liu, P., **Peterman, K.D.**, Yu, C., Schafer, B.W. (2012) "Cold-formed steel shear walls in ledger framed buildings." Structural Stability Research Council Annual Stability Conference, Grapevine, TX, April 18-22, 2012. ---*Winner of the Vinnakota Award for best student paper.*
- [1] **Peterman, K.D.**, Schafer, B.W. (2011) "Stability of sheathed cold-formed steel studs under axial load and bending." Structural Stability Research Council Annual Stability Conference, Grapevine, TX, April 18-22, 2011.

Presentations and Seminars

- [5] *Early, A., Wood, R., **Peterman, K.D.**, "Analysis of the Post-Hurricane Collapse of Cold-Formed Steel Industrial Buildings." Abstract submitted to the Engineering Mechanics Institute Conference, Boston, MA, May 26-30, 2018.
- [4] **Peterman, K.D.**, Seminar given to University of Florida Civil Engineering Department (2 March 2017)
- [3] **Peterman, K.D.**, Webster, M.D., D'Aloisio, J.A, Hajjar, J.F., "The Enlightened Structure: Reducing Material-Based Carbon Emissions." Building Energy 2016, Northeast Sustainable Energy Association, Boston MA, 2016.

[2] **Peterman, K.D.**, Nakata, N., Schafer, B.W., "Experimental performance of full-scale cold formed steel buildings under seismic excitations." Quake Summit, Reno, NV, 2013.

[1] **Peterman, K.D.**, Schafer, B.W., "Predicting seismic behavior in cold-formed steel shear walls." Quake Summit, Boston, MA, 2012.

Curated Datasets

[4] [in progress, DOI will be assigned once complete – Peterman is among several PIs] Hurricane Harvey Structural Wind Reconnaissance Field Data. To be uploaded to DesignSafe-CI.org as part of the NSF-sponsored NHERI effort.

[3] **Peterman, K.D.**, Schafer, B.W., Madsen, R.L., Buonopane, S.G., Narutoshi, N. (2014). "Experimental Performance of Full-Scale Cold-Formed Steel Buildings Under Seismic Excitations", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI: 10.4231/D3DB7VR05

[2] Liu, P. **Peterman, K.D.**, Schafer, B.W. (2014). "Experimental Performance of Cold-Formed Steel Shear Walls under Cyclic Loading", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI: 10.4231/D38K74X6S

[1] **Peterman, K.D.**, Schafer, B.W. (2014). "Experimental Performance of Fastener-Stud-Sheathing Connections in Cold-Formed Steel Shear Walls", Network for Earthquake Engineering Simulation (distributor), Dataset, DOI: 10.4231/D3K35MF32

MUSICAL POSITIONS HELD

I have been an avid classical clarinetist since I picked up the instrument at age 10. In the ensuing decades, it has been my constant companion, and I have made community music a priority in my personal life. To love music is to share it, and it has been one of the great joys of my life to be able to do so. Indeed, I have been a clarinetist for longer than I have been an engineer, so it would be remiss to exclude it from this curriculum vitae.

2017-present	Principal Clarinet, the Pioneer Valley Symphony Orchestra
2016-present	Clarinetist, The Valley Winds
2014-2016	Principal Clarinet, Northeastern University Wind Ensemble
2014-2016	Principal Clarinet, Northeastern University Symphony Orchestra
2009-2014	Principal Clarinet, Hopkins Symphony Orchestra