

## **Samantha H. Daly**

Department of Mechanical Engineering  
Department of Materials Science and Engineering  
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### **EDUCATION**

Ph.D.	2007	Division of Engineering and Applied Science	Caltech
M.S.	2002	Division of Engineering and Applied Science	Caltech
B.E.	2001	Mechanical Engineering	Dartmouth
B.S.	2001	Mechanical Engineering modified with Mathematics	Dartmouth

### **PROFESSIONAL EXPERIENCE**

<i>7/16 –</i>	Associate Professor with Tenure, Department of Mechanical Engineering, University of California at Santa Barbara
<i>5/14 – 7/16</i>	Associate Professor with Tenure, Department of Mechanical Engineering, University of Michigan (courtesy appointment in MSE)
<i>1/15 – 5/15</i>	International Center for Materials Research (ICMR) Researcher in Residence, University of California at Santa Barbara
<i>1/11 – 5/14</i>	Assistant Professor, Department of Materials Science and Engineering (by Courtesy Appointment), University of Michigan, Ann Arbor.
<i>1/08 – 5/14</i>	Assistant Professor, Department of Mechanical Engineering, University of Michigan, Ann Arbor.

### **RESEARCH ACTIVITIES**

The Daly group specializes in the application of experimental mechanics to materials science in an effort to characterize, design, and develop advanced materials. The group investigates the mechanics of materials, fatigue, fracture, creep, composites, multi-functional materials, and advanced experimental techniques with a focus on novel approaches for small-scale characterization and the examination of environmental effects.

### **AWARDS AND HONOURS**

- Eshelby Mechanics Award, ASME, 2016.
- James W. Dally Award for Contributions to Education and Research Excellence in Experimental Mechanics, Society of Experimental Mechanics, 2016.
- National Academy of Engineering U.S. Frontiers of Engineering Symposium Attendee, 2015.
- Invited Speaker, Gordon Conference on Physical Metallurgy, 2015.
- Cover, Journal of Materials Science, July 2015.
- Student-Nominated for the Golden Apple Teaching Award, University of Michigan, 2015.
- College of Engineering 1938E Award, University of Michigan, 2014.
- Presentation to University of Michigan Board of Regents (as one of three university-wide example promotions), 2014.
- Lindseth Lecturer, Cornell University, 2014.
- Journal of Strain Analysis Young Investigator Lecturer, 2014.
- Student-Nominated for the Golden Apple Teaching Award, University of Michigan, 2014.
- Mechanical Engineering Department Achievement Award, University of Michigan, 2014.
- Best Paper of the Year, International Journal of Solids and Structures, 2014 (for Best Paper published in IJSS in 2013).
- NSF CAREER Award, 2013.
- Robert Caddell Memorial Materials & Manufacturing Award (with graduate student Adam Kammers), The University of Michigan, 2013.
- Hetényi Award, Society of Experimental Mechanics, 2013 (for Best Paper published in Experimental Mechanics in 2011).

- Young Investigator Award (AFOSR YIP), Air Force Office of Scientific Research, 2012.
- Orr Award for Early Career Excellence in Fatigue, Fracture, and Creep, American Society of Mechanical Engineers, 2011.
- Early Career Research Program Award, Office of Basic Energy Sciences, Department of Energy Office of Science, 2010.
- Alumni Day Seminar Speaker, California Institute of Technology, 2007.
- Everhart Award, California Institute of Technology, 2007.
- Charles D. Babcock Award, California Institute of Technology, 2007.

## FULL ARTICLES IN REFEREED PUBLICATIONS

*Name indicates a PhD student in the Daly group; Name\* indicates a non-PhD student*

1. Z. Chen, S. Daly. Active Slip System Identification in Polycrystalline Metals by Digital Image Correlation. *Submitted*, 2016.
2. A. Githens, S. Daly. Patterning Corrosion-Susceptible Metallic Alloys for Digital Image Correlation in a Scanning Electron Microscope. *Submitted*, 2016.
3. W. LePage, S. Daly, J. Shaw. Cross Polarization for Enhanced Digital Image Correlation Fidelity. *Experimental Mechanics*, *Accepted*, 2016.
4. M. Kimiecik, J.W. Jones, S. Daly. The Relationship between Martensite Configuration and Local Strain Ratcheting in the SMA Nickel-Titanium. *JMPS*, 89: 16-30, 2016.
5. J. Tracy, S. Daly, K. Sevens. Multi-Scale Damage Characterization in Continuous Fiber Ceramic Matrix Composites. *Journal of Materials Science*, 50(15): 5386-5299, 2015.
6. M. Kimiecik, J.W. Jones, S. Daly. Grain Orientation Dependence of Martensitic Phase Transformation in Polycrystalline Shape Memory Alloys. *Acta Materialia*, 94: 214-223, 2015.
7. J. Tracy, A. Waas, S. Daly. Experimental Assessment of Fracture Toughness in Ceramic Matrix Composites Using the J-integral with Digital Image Correlation Part I: Methodology and Validation. *Journal of Materials Science*, 50(13): 4646-4658, 2015. **(Cover Article)**
8. J. Tracy, A. Waas, S. Daly. Experimental Assessment of Fracture Toughness in Ceramic Matrix Composites Using the J-integral with Digital Image Correlation Part II: Application to SiC/SiC CMCs. *Journal of Materials Science*, 50(13): 4659-4671, 2015.
9. A. Kammers, J. Wongsangam, T. Langdon, S. Daly. The Microstructure Length Scale of Strain Rate Sensitivity in Ultrafine-Grained Aluminum. *Journal of Materials Research*, 30(07): 981-992, 2015.
10. J. Geathers, C.J. Torbet, J.W. Jones, S. Daly. Investigating Environmental Effects on Small Fatigue Crack Growth in Ti-6242S Using Combined Ultrasonic Fatigue and Scanning Electron Microscopy. *International Journal of Fatigue* 70: 154-162, 2015.
11. J. Tracy, A. Waas, S. Daly. Constituent Level Characterization of Damage in Ceramic Matrix Composites at High Temperature. *Journal of the American Ceramic Society*, 2015. DOI: 10.1111/jace.13538
12. J. Tracy, A. Waas, S. Daly. Statistical Analysis of the Influence of Microstructure on Damage in Fibrous Ceramic Matrix Composites. *Restricted Access*. 2014.
13. A. Kammers, J. Wongsangam, T. Langdon, S. Daly. The Effect of Microstructure Heterogeneity on Active Deformation Mechanisms in Ultrafine-Grained Aluminum. *Journal of Materials Research*, 29(15): 1664-1674, 2014.
14. B. Reedlunn, C. Churchill, E. Nelson\*, J. Shaw, S. Daly. Tension, Compression, and Bending of Superelastic Shape Memory Alloy Tubes. *JMPS*, 63: 506-537, 2014.
15. A. Kammers, S. Daly. Digital Image Correlation under Scanning Electron Microscopy: Methodology and Validation. *Experimental Mechanics*, 53:1743-1761, 2013.
16. A. Kammers, S. Daly. Self-Assembled Nanoparticle Surface Patterning for Improved Digital Image Correlation in a Scanning Electron Microscope, *Experimental Mechanics*, 53:1743-1761, 2013.
17. M. Kimiecik, J.W. Jones, S. Daly. Quantitative Analysis of Phase Transformation in Ni-Ti Shape Memory Alloys. *Advanced Materials & Processes* April 2013.

18. B. Reedlunn, S. Daly, J.A. Shaw. Superelastic Shape Memory Alloy Cables: Part I – Isothermal Tension Experiments. *IJSS*, 50(20-21): 3009-3026, 2013. **(IJSS Award for Best Paper Published in 2013; Reached #1 Most Downloaded IJSS Paper.)**
19. B. Reedlunn, S. Daly, J.A. Shaw. Superelastic Shape Memory Alloy Cables: Part II – Isothermal Subcomponent Responses. *IJSS*, 50(20-21): 3027-3044, 2013. **(Reached #10 Most Downloaded IJSS Paper.)**
20. K. Kim, S. Daly. The Effect of Texture on Stress-Induced Martensite Formation in Nickel-Titanium. *Smart Materials and Structures*, 22(7): 075012, 2013.
21. M. Kimiecik, J.W. Jones, S. Daly. A New Methodology for Tracking Phase Transformation in SMAs at the Microstructural Length Scale. *Materials Letters*, 95: 25-29, 2013.
22. B. Reedlunn, S. Daly, L. Hector, P. Zavattieri, J. Shaw. Tips & Tricks for Characterizing Shape Memory Wire Part 5: Full-field Strain Measurement by Digital Image Correlation. *Experimental Techniques*, 37(3): 62-78, 2013.
23. B. Reedlunn, S. Daly, J. Shaw. Elongation-Rate Sensitivity of Superelastic Shape Memory Alloy Cables. *In preparation*, 2013.
24. A. Kammers, S. Daly. Small-Scale Patterning Methods for Digital Image Correlation Under Scanning Electron Microscopy. *Meas. Sci. Technol.* 22(12) 125501, 2012.
25. K. Kim, S. Daly. Martensite Strain Memory in the Shape Memory Alloy NiTi under Mechanical Cycling. *Invited publication: Experimental Mechanics* 51(4): 641-652, 2011. **(M. Hetényi Award for the Best Paper published in Experimental Mechanics in 2011.)**
26. S. Desindes\*, S. Daly. The Small-Scale Yielding of Shape Memory Alloys under Mode III Fracture. *International Journal of Solids and Structures*, 47(5): 730-737, 2010.
27. S. Daly, D. Rittel, K. Bhattacharya, G. Ravichandran. Large Deformation of Nitinol Under Shear Dominant Loading. *Invited publication: Experimental Mechanics*, 49(2): 225-233, 2009.
28. S. Daly, G. Ravichandran, K. Bhattacharya. Stress-Induced Martensitic Transformation in Thin Sheets of Nitinol. *Acta Materialia*, 55:3593-3600, 2007.
29. S. Daly, A. Miller, G. Ravichandran, K. Bhattacharya. An Experimental Investigation of Crack Initiation in Thin Sheets of Nitinol. *Acta Materialia*, 55:6322-6330, 2007.

## CHAPTERS IN BOOKS

1. Daly, S.H. 2010. Digital Image Correlation in Experimental Mechanics for Aerospace Materials and Structures. *Encyclopedia of Aerospace Engineering*.

## SHORT COURSES

1. Deformation Tracking at the Microstructural Length Scale. *UC Santa Barbara*, August 2013, Santa Barbara, California.
2. Principles and Techniques of Digital Image Correlation. *Microscopy and Microanalysis 2011*, August 7-11, Nashville, Tennessee.

## INVITED PRESENTATIONS

- Fall MRS, Symposium on Cyclic Deformation and Fracture at the Nanoscale, November 2016 (scheduled)
- Fall MRS, Symposium on Intermetallic-Based Alloys – From Fundamentals to Applications, November 2016 (scheduled)
- Dartmouth College, May 2016 (scheduled).
- University of Houston, March 2016. **(Eshelby Award Lecture)**
- Purdue University, March 2016 (scheduled)
- 2016 TMS Annual Meeting & Exhibition, Session on Advanced Characterization Techniques for Quantifying and Modeling Deformation, February 2016.
- UCSB High Temperature Materials Workshop, January 2016.
- Johns Hopkins, CEIMM group, September 2015.

- Johns Hopkins, ME Department, September 2015.
- Sandia Livermore, July 2015.
- Gordon Conference on Physical Metallurgy, July 2015.
- Inter-DOE Lab DIC Symposium, Sandia National Labs – **Keynote Speaker**, June 2015.
- Teledyne Technologies Inc., May 2015.
- UC Riverside, May 2015.
- USC, April 2015.
- HRL Laboratories, March 2015.
- 2015 TMS Annual Meeting & Exhibition, Session on Multi-Scale Microstructure, Mechanics & Prognosis of High Temperature Alloys, March 2015.
- UC Santa Barbara, March 2015.
- Cocoa Beach CMC Conference, January 2015.
- Colorado School of Mines, January 2015.
- Caltech, January 2015.
- Los Alamos National Laboratory, Materials Science, October 2014.
- Society of Experimental Mechanics, June 2014. (**Journal of Strain Analysis Young Investigator Lecture**)
- Harvard University, April 2014.
- Cornell University, April 2014. (**Lindseth Lecture**)
- Cocoa Beach CMC Conference, January 2014 (given by graduate student Jared Tracy due to maternity leave).
- Materials Science and Technology (MS&T), October 2013.
- Medtronic, September 2013.
- Columbia University, September 2013.
- UC Santa Barbara, August 2013.
- Banff Centre, Mathematics and Mechanics in the Search for New Materials, July 2013.
- Society of Engineering Science (SES) Conference, Symposium on Mechanics of Phase Transforming and Multifunctional Materials – **Keynote Speaker**, July 2013.
- Stanford University, June 2013.
- Case Western Reserve University, April 2013.
- Brown University, February 2013.
- Saturday Morning Physics, University of Michigan Physics Department, February 2013. *Available online at <http://lecb.physics.lsa.umich.edu/CWIS/SPT--BrowseResources.php?ParentId=702>*
- Cocoa Beach CMC Conference, January 2013.
- University of Houston, December 2012.
- Purdue University, December 2012.
- Carnegie Mellon University, October 2012.
- Wright-Patterson Air Force Base, June 2012.
- International Symposium on Plasticity, Puerto Rico, January 2012.
- ASME 2011 International Mechanical Engineering Congress & Exposition, Denver Colorado, November 11-17, 2011. (**Orr Award Seminar**)
- University of Wisconsin – Madison. September 2011.
- Ohio State University, May 2011.
- Department of Materials Science and Engineering, University of Illinois at Urbana-Champaign, November 2010.
- University of Michigan, Department of Materials Science and Engineering, September 2010.
- Brown University, Department of Engineering, February 2010.
- California Institute of Technology, Materials Research Lectures, February 2010.
- Carnegie Mellon University, November 2009.
- Society of Experimental Mechanics, Columbia, South Carolina, October 2009.

- Purdue University, May 2007.
- Johns Hopkins University, April 2007.
- University of Michigan, April 2007.
- University of California – San Diego, February 2007.
- University of Southern California, January 2007.
- Everhart Lecture Series, Award Seminar, Caltech, Pasadena, CA, 2007.
- Caltech Alumni Association 70<sup>th</sup> Annual Seminar Day, Pasadena, CA, 2007.
- U.S. Army Research Laboratory, Aberdeen, MD, 2006.

## TEACHING EXPERIENCE

Theory of Solid Continua (MechEng 511)	Fall 2011
Experimental Methods in Solids (MechEng 599)	Winter 2009, 2013
Mechanics of Materials (MechEng 382)	Fall 2008-2014, Winter 2016
Theory of Plasticity (MechEng 519)	Winter 2008, 2010, 2012, Fall 2015

Teaching Scores (out of 5.0), where  $Q$  = “Overall, the instructor was an excellent teacher.” Note W14 I was on maternity leave and W15 I was on sabbatical, therefore there are no teaching scores for those semesters.

Course #	Course title	Term	Enrollment/ Responses	$Q$
ME382	Mech Behav Matls	F14	103/84	4.93
ME382	Mech Behav Matls	F13	103/84	4.80
ME599	Spec Top Engin	W13	17/14	4.72
ME382	Mech Behav Matls	F12	74/45	4.96
ME519	Theory Plasticity I	W12	7/7	4.80
ME382	Mech Behav Matls	F11	80/39	4.85
ME511	Solid Continua	F11	30/22	4.17
ME382	Mech Behav Matls	F10	58/41	4.77
ME519	Theory Plasticity I	W10	24/16	4.50
ME382	Mech Behav Matls	F09	64/33	4.83
ME599	Spec Topics in ME	W09	10/6	4.50
ME382	Mech Behav Matls	F08	73/53	3.98
ME519	Theory Plasticity I	W08	8/8	4.50

## PROFESSIONAL ACTIVITIES

- Board of Directors, Society of Engineering Science (SES), 2014-2016.
- Board of Directors, ASM – SMST, 2015-2018.
- Associate Editor, *Experimental Mechanics*, January 2014-December 2016.
- Editorial Board, *Strain*, June 2015-Current.
- Fatigue and Fracture Division in the Society of Experimental Mechanics (SEM):  
Chair 2012-2014; Vice-Chair 2010-2012; Secretary 2008-2010
- DIC Challenge Board, Society of Experimental Mechanics (SEM), 2012-current
- Sole Organizer for SEM-UM Graduate Student Symposium May 2014; Co-Organizer for 2014 USNCTAM Conference; 2014, 2013, 2012, 2011 Society of Experimental Mechanics Conference (SEM) Conference, 2014, 2012, 2011, 2008 Society of Engineering Science (SES) Conference, 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials.
- DOE Panel Member 2011, 2012, 2014; NSF Panel Member, 2008, 2010, 2011, 2012.

- Reviewer for journals including Journal of Mechanics and Physics of Solids, International Journal of Fracture, International Journal of Solids and Structures, Experimental Mechanics, Mechanics of Materials, Journal of Applied Mechanics, ASME Journal of Applied Mechanics, Mechanics of Time-Dependent Materials, International Journal of Plasticity, Journal of Applied Physics, Engineering Fracture Mechanics, Smart Structures and Materials, Continuum Mechanics and Thermodynamics, amongst others.
- U-M College of Engineering Activities: Dean's Search Committee 2015, Advisory Committee, University of Michigan Electron Microbeam Analysis Laboratory, 2013-2016.
- U-M Departmental Activities: Mechanical Engineering Graduate Admissions Committee (2011-2012, 2012-2013 member), Mechanical Engineering Honors & Awards Committee (2013-2014, 2014-2015, 2015-2016 member), Mechanical Engineering Seminar Series Committee (2009-2010 member, 2010-2011 chair), Mechanical Engineering Junior Faculty Advising Luncheon Committee (2008-2009, member, 2009-2010, chair), Mechanical Engineering Strategic Planning Committee (2010, member)

## STUDENTS

### Current Students

- Jason Geathers (jointly advised with J. Wayne Jones), 2010-present  
Best in Show, TMS Student Poster Competition, 2015  
1<sup>st</sup> Place, TMS Student Poster Competition, Structural Materials Division, 2015  
1<sup>st</sup> Place, Society for Engineering Science (SES) Student Competition, 2014  
1<sup>st</sup> Place, Society for Experimental Mechanics (SEM) Student Competition, 2014  
2<sup>nd</sup> Place, U-M Engineering Graduate Student Symposium, Mechanics of Materials & Structures Division, 2013  
Rackham Merit Fellowship, University of Michigan, 2010-2012
- Yue (Joyce) Gong 2012-present
- William LePage 2013-present  
NDSEG Fellowship, 2014-2016
- Marissa Linne, 2013-present
- Michelle Harr, 2015-present  
Mechanical Engineering Departmental Merit Fellowship, University of Michigan

### Current Post-Doctoral Scholars

- Zhe Chen 2014-present

### Doctoral Students: Alumni

- Michael Kimiecik (jointly advised with J. Wayne Jones), 2010-present  
Materials Science and Engineering Graduate Fellowship, 2010  
*Current: Exponent*
- Jared Tracy 2010-2014  
Cover Article, Journal of Materials Science, 2015  
Richard and Eleanor Towner Prize for Distinguished Academic Achievement, University of Michigan College of Engineering, 2013  
Rackham Merit Fellowship, University of Michigan, 2009  
*Current: Postdoctoral Scholar at Stanford*

- Adam Kammers 2009-2014  
Physical Metallurgy Gordon Research Conference Poster Award, 2013  
Robert Caddell Memorial Materials and Manufacturing Award, University of Michigan, 2013  
Society for Experimental Mechanics (SEM), Student Competition - 3rd Place, 2012  
Alexander Azarkhin Award for Outstanding Doctoral Research, University of Michigan, 2012  
Rackham Non-Traditional Fellowship, University of Michigan, 2010  
*Current: Senior Engineer at Microscan*
- Kyubum Kim 2008-2013  
M. Hetényi Award, Society of Experimental Mechanics, 2013 (for Best Paper published in Experimental Mechanics in 2011).  
Graduate Excellence in Materials Science (GEMS) Award Sapphire Ranking, MS&T 2011  
*Current: Optimal Process Technologies LLC*
- Ben Reedlunn (jointly advised with J. Shaw), 2008-2011  
Best Paper of the Year, International Journal of Solids and Structures, 2014.  
Student best paper finalist at Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS) conference (6 finalists out of 48 entries)  
*Current: Staff Member, Sandia National Laboratories*

### **Master's Students : Alumni**

Eugene Bong (2014-2015), Alan Githens (2012-2015)

**Current and Past Undergraduate Students:** Jeremy Cho (5/2008-5/2009), Gretchen Miller (9/2008-7/2009), Thomas Fick (9/2008-6/2009), Jackie Herriage (1/2009-12/2009), Vipul Chhajer (5/2009-12/2009), Nathaniel Hinkle (9/2009-12/2009), Eric Champion (1/2010-5/2010), Lyndsey Pohl (1/2010-6/2010), Paul Schrems (6/2010-10/2010), Patrick Hopps (6/2010-9/2010), Emily Nelson (5/2010-6/2011), Jiechao Liu (6/2010-12/2010), Allison Ryan (9/2010-6/2011), Greg Cass (6/2011-4/2012), Emmanuel Nyangweso (6/2011-4/2012), Josh DeBoer (1/2012-12/2012), Sara Nitz (5/2012-12/2012), Steve Orloff (9/2013-6/2014), Adam Joyce (1/2013-6/2014), Monica Pinon (6/2014-8/2014), Wei Jin (Eugene) Bong (1/2013-9/2014), Michael Compagner (9/2014-6/2015), Jason Krystek (10/2014-current), Avery Samuel (9/2015-current), Jalil Alidoost (9/2015-current).

### **RECENT COLLABORATIONS (NON U-M)**

#### ***Collaborators and Co-Editors During the Past Four Years (Total = 40)***

Francois Barthelat (McGill), Eric Brown (Los Alamos National Laboratory), Doug Carper (GE), Vijay Chalivendra (U Mass Dartmouth), Isaac Chenchiah (U Bristol), Weinong Chen (Purdue) Kaushik Dayal (CMU), Marc DeGraef (CMU), Adrian DeWald (Hill Engineering), Michael Grediac (University Blaise Pascal – IFMA), Louis Hector (GM), Francois Hild (ENS Cachan), Vincent Ji (Univesite Paris – Sud 11), Nancy Johnson (GM), J. Wayne Jones (University of Michigan), Terry Langdon (USC), Francesco Lanza di Scalea (UCSD), Rob Lipton (LSU), Hongbin Lu (University Texas at Dallas), Tresa Pollock (UCSB), Michael Mello (Caltech), Paul Reynolds (Univeristy of Exeter), Mike Sangid (Purdue), Peter Sarosi (GM), Chris Sczepanski (Special Metals), Kathy Sevener (Vaplo), John Shaw (University of Michigan), Doron Shilo (Technion), Ghatu Subhash (University of Florida), Kimberly Turner (UCSB), Anton Van der Ven (UCSB), Parameswaran Venkitanarayanan (IIT Kanpur), Tony Waas (University of Washington), Junlan Wang (University of Washington), Jitraporn Wongsangam (King Mongkut's Institute of Technology, Thailand), Huimin Xie (Tsinghua), Satoru Yoneyama (Aoyama Gakuin University).

#### ***Investigator's Graduate Advisors (Total = 3)***

Ph.D. Advisor: Kaushik Bhattacharya (Caltech), Guruswami Ravichandran (Caltech)

M.S. Advisor: Richard Murray (MS)