

Jagannathan Rajagopalan, Ph.D.

School for Engineering of Matter, Transport, and Energy
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EDUCATION

- Ph.D. 2009, Mechanical Science and Engineering, University of Illinois at Urbana-Champaign, Urbana, IL.
Ph.D. advisor: Taher Saif, Dissertation: "Microstructural heterogeneity and the mechanical behavior of nanocrystalline metals".
- M.Tech. 2004, Mechanical Engineering, Indian Institute of Technology Madras, Chennai, India.
- B.Tech. 2004, Mechanical Engineering, Indian Institute of Technology Madras, Chennai, India.

PROFESSIONAL EXPERIENCE

- 2018- *Associate Professor*, School for Engineering of Matter, Transport and Energy (SEMTE), Arizona State University, Tempe, AZ.
- 2012-2018 *Assistant Professor*, School for Engineering of Matter, Transport and Energy (SEMTE), Arizona State University, Tempe, AZ.
- 2009-2011 *Post-doctorate Research Associate*, University of Illinois at Urbana-Champaign, Urbana, IL.

HONORS AND AWARDS

- 2018 Best student presentation (2nd prize) by Ph.D. student Paul Rasmussen at the 2018 TMS Annual Meeting.
- 2017 Best poster award (with Ph.D. student Ehsan Izadi) at the 2017 TMS Annual Meeting.
- 2015 NSF CAREER award.
- 2010 Keynote presentation, U.S. National Congress on Theoretical and Applied Mechanics.
- 2008 Best paper award nomination, Society of Engineering Science Conference.
- 2007 Mavis Memorial Fellowship, University of Illinois at Urbana-Champaign.
- 2007 Graduate college conference travel award, University of Illinois at Urbana-Champaign.

PROFESSIONAL AFFILIATIONS

The Minerals, Metals and Materials Society (TMS); Materials Research Society (MRS)

RESEARCH INTERESTS

Research interests in nanostructured materials, mechanics of materials, micro-electro-mechanical systems (MEMS), and in-situ electron microscopy. Specific interests include the synthesis of metallic/metallic alloy films with tailored microstructures, synthesis-structure-property relationships of amorphous and nanostructured metals and metallic alloys, in-situ transmission electron microscopy (TEM) deformation of thin films, MEMS based small scale mechanical testing.

TEACHING INTERESTS

Teaching interests and experience in solid mechanics, stress analysis, mechanics of micro/nanoscale systems and MEMS.

Peer-reviewed Journal Articles

(* Corresponding author, Bold font: ASU Ph.D. student, Underline: ASU Masters student)

1. **E. Izadi** and J. Rajagopalan*, "Strain rate dependence of cyclic deformation response in ultrafine-grained Al films with different textures," (to be submitted).
2. **E. Izadi**, P. Peralta and J. Rajagopalan*, "In situ TEM deformation of ultrafine-grained aluminum films with automated crystal orientation mapping," (in preparation).
3. **R. Sarkar** and J. Rajagopalan*, "Synthesis of thin films with highly tailored microstructures," *Materials Research Letters* 6, 398-405, 2018.
4. **E. Izadi**, S. Opie, H. Lim, P. Peralta and J. Rajagopalan*, "Effect of plastic anisotropy on the deformation behavior of bicrystalline aluminum films – experiments and modeling," *Acta Materialia* **142**, 58-70, 2018.
5. R. Vallabhaneni, **E. Izadi**, C.R. Mayer, C.S. Kaira, S.S. Singh, J. Rajagopalan and N. Chawla*, "In situ tensile testing of tin (Sn) whiskers in a Focused Ion Beam (FIB)/Scanning Electron Microscope (SEM)," *Microelectronics Reliability* (in press).
6. **E. Izadi**, A. Darbal, **R. Sarkar**, J. Rajagopalan*, "Grain rotations in ultrafine-grained aluminum films studied using in situ TEM straining with automated crystal orientation mapping," *Materials and Design* **113**, 186–194, 2017.
7. **R. Sarkar**, C. Ebner, **E. Izadi**, C. Rentenberger, and J. Rajagopalan*, "Revealing anelasticity and structural rearrangements in nanoscale metallic glass films using in situ TEM diffraction," *Materials Research Letters* **5**, 135-143, 2017.
8. T. W. Sowers, **R. Sarkar**, S. E. Prameela, **E. Izadi** and J. Rajagopalan*, "Capillary driven flow of polydimethylsiloxane in open rectangular micro channels," *Soft Matter* **12**, 5818-5823, 2016.

9. E. Izadi and J. Rajagopalan*, "Texture dependent strain rate sensitivity of ultrafine-grained aluminum films," *Scripta Materialia* **114**, 65-69, 2016.
10. C. Ebner, R. Sarkar, J. Rajagopalan, and C. Rentenberger*, "Local, atomic-level elastic strain measurements of metallic glass thin films by electron diffraction," *Ultramicroscopy* **165**, 51-58, 2016.
11. R. Sarkar, C. Rentenberger and J. Rajagopalan*, "Electron beam induced artifacts during in situ TEM deformation of nanostructured metals," *Scientific Reports* **5**, 16345, 2015.
12. S. Singh, R. Sarkar, H.-X. Xie, C. Mayer, J. Rajagopalan, and N. Chawla*, "Tensile behavior of single-crystal tin whiskers," *Journal of Electronic Materials* **43**, 978-982, 2014.
13. B. J. Williams, S. A. Anand, J. Rajagopalan and M. T. A. Saif*, "A self-propelled biohybrid swimmer at low Reynolds number," *Nature Communications* **5**, 3081, 2014.
14. J. Rajagopalan* and M. T. A. Saif, "Fabrication of freestanding 1-D PDMS microstructures using capillary micromolding," *Journal of Microelectromechanical Systems* **22**, 992-994, 2013.
15. J. Rajagopalan and M. T. A. Saif*, "Effect of microstructural heterogeneity on the mechanical behavior of nanocrystalline metal films," *Journal of Materials Research* **26**, 2826-2832, 2011.
16. J. Rajagopalan and M. T. A. Saif*, "MEMS sensors and microsystems for cell mechanobiology," *Journal of Micromechanics and Microengineering* **21**, 054002, 2011
17. J. Rajagopalan, A. Tofangchi and M. T. A. Saif*, "Linear, high-resolution bioMEMS force sensors with large measurement range," *Journal of Microelectromechanical Systems* **19**, 1380-1389, 2010.
18. W. Kang, J. Rajagopalan and M. T. A. Saif*, "In situ uniaxial mechanical testing of small scale materials – a review," *Nanoscience and Nanotechnology Letters* **2**, 282-287, 2010.
19. J. Rajagopalan, A. Tofangchi and M. T. A. Saif*, "*Drosophila* neurons actively regulate axonal tension *in vivo*," *Biophysical Journal* **99**, 3208-3215, 2010.
20. J. Rajagopalan, C. Rentenberger, P. H. Karthaler, G. Dehm and M. T. A. Saif*, "In situ TEM study of microplasticity and Bauschinger effect in nanocrystalline metals," *Acta Materialia* **58**, 4772-4782, 2010.
21. J. Rajagopalan*, J. H. Han and M. T. A. Saif, "On plastic strain recovery in freestanding nanocrystalline metal thin films," *Scripta Materialia* **59**, 921-926, 2008.
22. J. Rajagopalan, J. H. Han and M. T. A. Saif*, "Bauschinger effect in unpassivated freestanding nanoscale metal films," *Scripta Materialia* **59**, 734-737, 2008.
23. J. Rajagopalan, J. H. Han, and M. T. A. Saif*, "Plastic deformation recovery in freestanding nanocrystalline aluminum and gold thin films," *Science* **315**, 1831-1834, 2007.
24. J. Rajagopalan and M. T. A. Saif*, "A single degree of freedom model for thermoelastic damping," *Journal of Applied Mechanics* **74**, 461-468, 2007.
25. J. Rajagopalan, K. Balasubramaniam* and C. V. Krishnamurthy, "A phase reconstruction algorithm for Lamb wave based structural health monitoring of anisotropic multilayered composite plates," *Journal of the Acoustical Society of America* **119**, 872-878, 2006.
26. J. Rajagopalan, K. Balasubramaniam* and C. V. Krishnamurthy, "A single transmitter multi receiver (STMR) PZT array for guided ultrasonic wave based structural health monitoring of large isotropic plate structures," *Smart Materials and Structures* **15**, 1190-1196, 2006

Patents/Disclosures

1. J. Rajagopalan, **R. Berlia** and **E. Izadi**, "Metallic films with precisely engineered multimodal architectures," Invention Disclosure, ID M17-135P, 2017.
2. J. Rajagopalan and **R. Sarkar**, "Systems and methods for tailored microstructures using templated grain nucleation," Patent Application, International Application Number PCT/US15/59162, 2015.
3. J. Rajagopalan, M. T. A. Saif, "High aspect ratio polymer elongate and one-dimensional microstructure fabrication," U.S. Patent Application, Serial Number: 14/068,224, 2013.

Invited Book Chapters

1. J. Rajagopalan, Microelectromechanical Systems (MEMS)-Based Testing of Materials. In: Hsueh CH. et al. (eds) Handbook of Mechanics of Materials. *Springer*, Singapore, 2018.
2. W. W. Ahmed, J. Rajagopalan, A. Tofangchi, M. T. A. Saif, "Neuromechanics: The role of tension in neuronal growth and memory," pp. 35-64, in Nano and Cell Mechanics, Edited by Horacio Espinosa and Gang Bao, *John Wiley and Sons*, 2013.

Peer-reviewed Conference Proceedings

1. B. J. Williams, S. A. Anand, J. Rajagopalan and M. T. A. Saif, "A microfabricated, biohybrid, soft robotics flagellum," IEEE 27th International Conference on Micro Electro Mechanical Systems (MEMS), 192-195, 2014 – selected for podium presentation (6% acceptance rate).
2. J. Rajagopalan, A. Tofangchi and M. T. A. Saif, "The role of mechanical tension in neurons," MRS Symposium Proceedings Vol. 1274, QQ01-06, 2010.
3. J. Rajagopalan, A. Tofangchi and M. T. A. Saif, "Highly linear, ultra sensitive bio-MEMS force sensors with large force measurement range," IEEE 23rd International Conference on Micro Electro Mechanical Systems (MEMS), 88-91, 2010 – selected for podium presentation (8% acceptance rate).

Non-refereed Conference Proceedings

1. **E. Izadi**, P. Peralta and J. Rajagopalan, "In situ TEM investigation of the deformation mechanisms and microstructural changes in ultrafine-grained non-textured aluminum film using automated crystal orientation mapping," *Microscopy and Microanalysis*, 23 (S1), 768-769, 2017.
2. **R. Sarkar**, C. Ebner, J. Rajagopalan and C. Rentenberger, "In-situ deformation of various micro/nanoscaled samples in the transmission electron microscope: experimental results and pitfalls," *Microscopy and Microanalysis*, 23 (S1), 762-763, 2017.

3. **R. Sarkar**, C. Rentenberger and J. Rajagopalan, "Anomalous beam effects during in situ transmission electron microscopy deformation of nanocrystalline and ultrafine-grained metals," *Microscopy and Microanalysis* 22 (S3), 1498-1499, 2016.
4. **R. Sarkar**, C. Ebner, C. Rentenberger and J. Rajagopalan, "De-coupling anelastic and elastic deformation in metallic glass thin films via measurement of micro strain tensors using in situ electron diffraction," *Microscopy and Microanalysis* 22 (S3), 524-525, 2016.
5. **E. Izadi**, A. Darbal, P. Peralta, J. Rajagopalan, "In situ TEM straining of ultrafine-grained aluminum films of different textures using automated crystal orientation mapping," *Microscopy and Microanalysis* 22 (S3), 1950-1951, 2016.
6. B. Williams, S. Anand, J. Rajagopalan, T. Saif, "Artificial swimmer powered by cardiomyocytes," ASME Summer Bioengineering Conference, 2013.
7. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Inhomogeneity and size of microstructure – a new paradigm in understanding deformation mechanism of nano grained material," *Proceedings of the 2008 TMS meeting*, 201-206, 2008.
8. J. Han, J. Rajagopalan, and M. T. A. Saif, "MEMS-Based testing stage to study electrical and mechanical properties of nanocrystalline metal films," *Proceedings of SPIE* **6464**, 64640C, 2007.
9. R. Jagannathan, B. V. Somasekhar, K. Balasubramaniam, and C. V. Krishnamurthy, "Plate waves structural health monitoring of composite structures," *Review of Progress in Quantitative Non-Destructive Evaluation* **24 (B)**, 1802-1808, 2005.
10. S. Mahadev Prasad, R. Jaganathan, K. Balasubramaniam, and C. V. Krishnamurthy, "Structural health monitoring of anisotropic layered composite plates using guided ultrasonic Lamb wave data," *Review of Progress in Quantitative Non-Destructive Evaluation* **23 (B)**, 1460-1467, 2003.

Invited Lectures/Seminars

1. J. Rajagopalan, Interplay between microstructural size and heterogeneity and its effect on the mechanics of nanocrystalline metals, Mechanical Engineering Seminar, University of Houston, Houston, TX, 2013.
2. J. Rajagopalan, Mechanics at the nanoscale - Interplay between microstructural size and heterogeneity and its effect on the mechanical behavior of nanocrystalline metals, Mechanical Engineering Seminar, Indian Institute of Technology Madras, Chennai, India, 2012.
3. J. Rajagopalan, Mechanics at the nanoscale - Interplay between microstructural size and heterogeneity and its effect on the mechanical behavior of nanocrystalline metals, Aerospace Engineering Seminar, Indian Institute of Science, Bangalore, India, 2011.
4. J. Rajagopalan, Heterogeneity at the nanoscale - how microstructural variations lead to unusual mechanical behavior in nanocrystalline metals, Nanohour Seminar, University of Illinois at Urbana-Champaign, Urbana, IL, 2010.

5. J. Rajagopalan, Bauschinger effect in freestanding metal films – insights from in situ TEM studies, Materials Interest Group Seminar, University of Illinois at Urbana-Champaign, Urbana, IL, 2009.

Non-refereed Conference Presentations

1. **E. Izadi**, P. Peralta and J. Rajagopalan, "In situ TEM investigation of the deformation mechanisms and microstructural changes in ultrafine-grained non-textured aluminum film using automated crystal orientation mapping," *Microscopy and Microanalysis*, 23 (S1), 768-769, 2017
2. **R. Sarkar**, C. Ebner, J. Rajagopalan and C. Rentenberger, "In-situ deformation of various micro/nanoscaled samples in the transmission electron microscope: experimental results and pitfalls," *Microscopy and Microanalysis*, 23 (S1), 762-763, 2017 (Invited Presentation)
3. **E. Izadi**, A. Darbal and J. Rajagopalan, "Investigating the deformation behavior of ultrafine-grained aluminum films using in situ TEM with automated crystal orientation mapping," MRS Spring Meeting, Phoenix, AZ, 2017.
4. **R. Sarkar** and J. Rajagopalan, "Grain growth and mechanical behavior of nanostructured intermetallic films studied using in situ TEM annealing and tensile straining," TMS Annual Meeting, San Diego, CA, 2017.
5. **E. Izadi**, A. Darbal, **R. Sarkar** and J. Rajagopalan, "Investigating grain rotations in ultrafine-grained aluminum films using in situ TEM straining with automated crystal orientation mapping," TMS Annual Meeting, San Diego, CA, 2017.
6. **E. Izadi** and J. Rajagopalan, "Ex-situ and in-situ TEM investigation of texture dependent strain rate sensitivity of Bauschinger effect in ultrafine-grained Al films," TMS Annual Meeting, San Diego, CA, 2017.
7. **R. Sarkar**, C. Ebner, C. Rentenberger, J. Rajagopalan, "Measurement of micro strains in amorphous Ti45Al55 thin films using selected area diffraction during in situ TEM straining", TMS Annual Meeting, Nashville, TN, 2016.
8. **R. Sarkar**, C. Ebner, C. Rentenberger, and J. Rajagopalan, "Micro strain measurements on amorphous titanium aluminide thin films during in situ TEM straining", MRS Spring Meeting, Phoenix, AZ, 2016.
9. **R. Sarkar** and J. Rajagopalan, "Seed layer mediated crystallization of amorphous TiAl thin films to obtain tailored microstructures", MRS Spring Meeting, Phoenix, AZ, 2016.
10. **R. Sarkar**, C. Rentenberger and J. Rajagopalan, "Anomalous beam effects during in situ TEM deformation of nanocrystalline and ultrafine-grained metals", MRS Spring Meeting, Phoenix, AZ, 2016.
11. **R. Sarkar** and J. Rajagopalan, "Seed Layer Mediated Crystallization of Amorphous Intermetallic Films to Obtain Tailored Microstructures", SES Conference, University of Maryland, College Park, MD, 2016.
12. **R. Sarkar**, C. Ebner, **E. Izadi**, C. Rentenberger and J. Rajagopalan, "Measurements of atomic strains in metallic glass thin films using electron diffraction during in-situ TEM straining," SES Conference, University of Maryland, College Park, MD, 2016.

13. **R. Sarkar**, C. Ebner, **E. Izadi**, C. Rentenberger and J. Rajagopalan, "Local atomic level strain measurements on metallic glass thin films using selected area diffraction", ASME IMECE, Phoenix, AZ, 2016.
14. **R. Sarkar** and J. Rajagopalan, "Synthesis of intermetallic thin films with tailored microstructures", ASME IMECE, Phoenix, AZ, 2016.
15. **R. Sarkar** and J. Rajagopalan, "Tailoring the microstructure of intermetallic films by seed layer mediated crystallization from an amorphous phase", MRS Fall Meeting, Boston, MA, 2016.
16. **E. Izadi**, A. Darbal, P. Peralta and J. Rajagopalan, "In situ TEM straining of aluminum films of different textures using automated crystal orientation mapping," Microscopy and Microanalysis Conference, Columbus, OH, 2016.
17. **E. Izadi**, A. Darbal, **R. Sarkar** and J. Rajagopalan, "Grain rotations in ultrafine-grained Aluminum films - insights from in situ TEM deformation with automated crystal orientation mapping," MRS Fall Meeting, Boston, MA, 2016.
18. **E. Izadi**, A. Darbal, P. Peralta and J. Rajagopalan "In situ TEM study on deformation behavior of ultrafine-grained aluminum films of different textures with automated crystal orientation mapping," ASME IMECE, Phoenix, AZ, 2016.
19. **E. Izadi**, P. Peralta and J. Rajagopalan "Effect of loading direction and plastic anisotropy on mechanical behavior of bicrystalline aluminum films," ASME IMECE, Phoenix, AZ, 2016.
20. S. Opie, **E. Izadi**, J. Rajagopalan, P. Peralta, "Plastic Anisotropy in Nano-bicrystalline Aluminum Films – Experiments and Modeling." ASME IMECE, Phoenix, AZ, 2016.
21. **E. Izadi**, A. Darbal, **R. Sarkar**, P. Peralta and J. Rajagopalan, "In situ TEM straining with ACOM of ultrafine-grained aluminum films with different textures," MRS Spring Meeting, Phoenix, AZ, 2016.
22. **E. Izadi**, A. Darbal, **R. Sarkar** and J. Rajagopalan, "Investigating deformation mechanisms in ultrafine-grained metal films using MEMS based in situ TEM with automated crystal orientation mapping," SES Conference, University of Maryland, College Park, MD, 2016.
23. **E. Izadi**, H. Lim, R. McDonald, J. Rajagopalan and P. Peralta, "Effect of texture and plastic anisotropy on stress-strain response of nanoscale aluminum films," TMS Annual Meeting, Nashville, TN, 2016.
24. **R. Sarkar**, C. Rentenberger and J. Rajagopalan, "Beam Induced Artifacts during in situ Transmission Electron Microscopy Deformation of Nanocrystalline and Ultrafine-grained Metals," TMS Annual Meeting, Nashville, TN, 2016.
25. **R. Sarkar**, C. Ebner, **E. Izadi**, C. Rentenberger and J. Rajagopalan, "De-coupling anelastic and elastic deformation in metallic glass thin films via measurement of micro strain tensors using in situ electron diffraction," Microscopy and Microanalysis Conference, Columbus, OH, 2016.
26. **R. Sarkar**, C. Rentenberger and J. Rajagopalan, "Beam induced artifacts during in situ transmission electron microscopy deformation of nanocrystalline and ultrafine-grained metals," Microscopy and Microanalysis Conference, Columbus, OH, 2016.
27. **R. Sarkar**, C. Ebner, J. Rajagopalan and C. Rentenberger, "Anelastic behaviour of amorphous TiAl measured by in-situ electron scattering," Thermec 2016, Graz, Austria, 2016.

28. **E. Izadi** and J. Rajagopalan, "Effect of plastic anisotropy on the deformation behavior of bicrystalline, ultrafine-grained aluminum films," SES Conference, Texas A&M University, College Station, TX, 2015.
29. **R. Sarkar**, C. Rentenberger and J. Rajagopalan, "Beam induced artifacts during in situ transmission electron microscopy deformation of nanocrystalline and ultrafine-grained aluminum films," SES Conference, Texas A&M University, College Station, TX, 2015.
30. **E. Izadi** and J. Rajagopalan, "The effect of strain rate on flow stress of textured and non-textured aluminum films," ASME IMECE, Houston, TX, 2015.
31. **R. Sarkar**, C. Rentenberger and J. Rajagopalan, "Electron beam induced defect activation and stress relaxation in aluminum during in situ transmission electron microscopy deformation," ASME IMECE, Houston, TX, 2015.
32. R. Vallabhaneni, **E. Izadi**, S. S. Singh, C. Mayer, J. Rajagopalan, N. Chawla, "In-situ tensile behavior of tin whiskers," TMS Annual Meeting, Orlando, FL, 2015.
33. **E. Izadi** and J. Rajagopalan, "Strain rate dependence of yield stress and early Bauschinger effect in nanoscale aluminum films with different textures," SES Conference, West Lafayette, IN, 2014.
34. S. S. Singh, **R. Sarkar**, H. Xie, C. Mayer, J. Rajagopalan, N. Chawla, "Tensile behavior of Sn whiskers by FIB lift-out and MEMS testing in SEM," TMS Annual Meeting, San Diego, CA, 2014.
35. J. Rajagopalan, A. Tofangchi and M. T. A. Saif, "In vivo mechanical behavior of Drosophila Neurons," SES Conference, Brown University, Providence, RI, 2013.
36. C. Rentenberger, C. Gammer, D. Geist, J. Rajagopalan, H. P. Karnthaler, G. Dehm and T. A. Saif, "In-situ and post mortem TEM studies of nanostructured materials" E-MRS conference, Warsaw, Poland, 2011. (Invited Presentation)
37. J. Rajagopalan, A. Tofangchi and M. T. A. Saif, "Mechanical behavior of neurons in live Drosophila embryos," Biomedical Engineering Society Meeting, Austin, TX, 2010.
38. J. Rajagopalan and M. T. A. Saif, "Coupled effect of size and heterogeneity on metal plasticity," US National Congress on Theoretical and Applied Mechanics, State College, PA 2010. (Invited Presentation)
39. J. Rajagopalan, A. Tofangchi and M. T. A. Saif, "Ultra sensitive Bio-MEMS force sensors with large force measurement range," ASME First Global Congress on NanoEngineering for Medicine and Biology, Houston, TX, 2010.
40. C. Rentenberger, J. Rajagopalan, G. Dehm, H. P. Karnthaler and T. A. Saif, "Extended microplasticity and Bauschinger effect of nanocrystalline Au and Al studied by in-situ TEM," 15th International Conference on the Strength of Materials, Dresden, Germany, 2009.
41. J. Rajagopalan, C. Rentenberger, G. Dehm, H. P. Karnthaler and T. A. Saif, "Quantitative in situ TEM study of deformation and fracture of nanoscale Aluminum Films," ASME IMECE, Lake Buena Vista, FL, 2009.
42. J. Rajagopalan and M. T. A. Saif, "Microstructural heterogeneity and the mechanical behavior of nanoscale aluminum films," ASME IMECE, Lake Buena Vista, FL, 2009.
43. C. Rentenberger, C. Mangler, C. Gammer, J. Rajagopalan and H. P. Karnthaler "Nanostructures in metals and intermetallics studied by TEM," Microscopy Conference, Graz, Austria, 2009. (Invited Presentation)

44. J. Rajagopalan, C. Rentenberger, G. Dehm, H. P. Karnthaler and M. T. A. Saif, "In situ TEM study of Bauschinger effect in unpassivated freestanding metal films," MRS Spring meeting, San Francisco, CA, 2009.
45. J. Rajagopalan and M. T. A. Saif, "Effect of size and heterogeneity of microstructure on nanocrystalline plasticity," Plasticity Conference, St. Thomas, U.S. Virgin Islands, 2009.
46. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Bauschinger effect in unpassivated freestanding metal films," MRS Fall Meeting, Boston, MA, 2008.
47. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Plastic strain recovery in freestanding nanocrystalline metal films" SES Conference, Urbana-Champaign, IL, 2008.
48. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Bauschinger effect in unpassivated freestanding metal thin films," SES Conference, Urbana-Champaign, IL, 2008.
49. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Thickness and grain size effects on plastic behavior of nanoscale metal films," MRS Spring meeting, San Francisco, CA, 2008.
50. J. Rajagopalan and M. T. A. Saif, "Time dependent plastic deformation recovery in freestanding nanocrystalline metal films," Mechanics of Time-Dependent Materials Conference, Monterey, CA, 2008. (Invited Presentation)
51. J. Rajagopalan and M. T. A. Saif, "MEMS for investigating mechanical behavior of nanoscale metal films," 6th International Workshop on Micro-Nano Electronics and Photonics, Islamabad, Pakistan, 2007.
52. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Time dependent plastic deformation recovery in freestanding nanocrystalline metal films," ASME IMECE, Seattle, WA, 2007.
53. J. Rajagopalan, J. H. Han and M. T. A. Saif, "Thermally activated plastic strain recovery in freestanding nanocrystalline aluminum thin films," ASME Mechanics and Materials Conference, Austin, TX, 2007.

RESEARCH GRANTS

1. Title: "Bottom-up synthesis of nanocrystalline intermetallic coatings with controlled microstructures", Investigator: J. Rajagopalan (PI), **National Science Foundation**.
2. Title: "CAREER: Reversible plasticity in nanocrystalline metals and alloys for shape memory applications", Investigator: J. Rajagopalan (PI), **National Science Foundation**.
3. Title: "Understanding the deformation of heterogeneous nanocrystalline metals - integrating in situ experiments with stochastic crystal plasticity", Investigators: J. Rajagopalan (PI) and P. Peralta (co-PI), Sponsor: **National Science Foundation**.
4. Title: "Exploring size dependent brittle-to-ductile transition in single crystal silicon using high temperature MEMS", Investigators: J. Rajagopalan (PI, 100%), Sponsor: **National Science Foundation (subcontract from University of Illinois at Urbana-Champaign)**.
5. Title: "Design and fabrication of nanolaminates with high resilience" Investigators: J. Rajagopalan (PI, 100%), Sponsor: **Intel Corporation**.

TEACHING EXPERIENCE**MAE 213: Solid Mechanics, Spring 2013, Fall 2015, 2016, Spring 2017**

- An undergraduate course that introduces students to the concepts of stress and strain in solids and the analysis of structures under axial, torsional and bending loadings to calculate internal stresses and deflections. Required course for mechanical and aerospace engineering undergraduates.

MAE 322: Structural Mechanics, Fall 2012, 2013, 2014

- An undergraduate course that introduces students to analysis of structures under combined loadings, stress and strain tensors and their transformations, constitutive equations, failure theories, fatigue and fracture, and energy methods. Required course for mechanical engineering undergraduates.

ASU 101-MEE: The ASU Experience, Fall 2014, 2015, 2016

- A first-year undergraduate course that introduces students to engineering ethics, academic integrity and opportunities for engaging in research on campus. Required course for mechanical engineering students.

MAE 598/519: Mechanics of micro/nano systems, Spring 2014, 2015, 2016, 2018

- A graduate level course that introduces students to basic microfabrication processes, and analysis of the processes and the fabricated micro/nanoscale structures from a mechanics perspective. Topics covered include the fundamentals of microfabrication, scaling of forces, thermal stresses and strains in thin beams, thermal oxidation and dynamics of MEMS.

MAE 520: Stress Analysis, Fall 2017

- A graduate level course that focuses on the concept of stress, strain and deformation of materials. Topics covered include stress-strain relationships, strain energy, failure theories, deformation of curved beams, unsymmetrical bending, shear center, torsion of noncircular sections, energy principles, Castigliano's theorem and inelastic behavior.

MENTORING

Undergraduate Students

- ASU Fulton Undergraduate Research Initiative: Cole Snider (2013, 2014)
- Barrett Honors College Thesis Advisor: Andrea Hall (2014)

- Barrett Honors College Thesis Second Reader: Nick Heitzman (2013), Anna Martin (2017)

Masters and Ph.D. Students Graduated

- *Ph.D.*: Rohit Sarkar (April 2017), Ehsan Izadi (June 2017)
- *Thesis Masters*: Timothy Sowers (2014), Suhas Prameela (2016)
- *Applied Project Masters*: Abhinav Prakash (2015)

Masters and Ph.D. Students in Progress

- Rohit Berlia (Ph.D., started Fall 2015), Paul Rasmussen (Ph.D., started Fall 2016), Santosh Rajarajan (M.S., started Spring 2018)

Student Awards and Honors

- Paul Rasmussen: Second prize in student poster competition at TMS Annual Meeting, 2018
- Ehsan Izadi (Ph.D.) - Best Poster Award at TMS Annual Meeting, 2017
- Ehsan Izadi (Ph.D.) - GPSA Travel Award, 2016
- Cole Snider (Undergraduate) - ASU Outstanding Graduate in Mechanical Engineering Finalist, 2015
- Andrea Hall (Undergraduate) - ASU Outstanding Graduate in Mechanical Engineering, 2014

Thesis Committees

- *Ph.D. Thesis committees*: Teng Ma, Mehul Bhatia, Carl Mayer, Antony Kirubanandham, Fraaz Tahir, Renuka Vallabhaneni, Benyamin Bazehhour, Scott Turnage, Yiyang Li, Irene Regalado
- *MS Thesis committees*: Robert McDonald, Yogesh Kadiyala, Bowen Gong, Gargi Kailkhura, Ashish Gopalakrishnan, Deepak Karunakaran

EXTERNAL SERVICE

Conference/Workshop Organization

- 2017 *Session chair*, TMS Annual Meeting 2017, San Diego, CA
- 2010 *Session chair*, U.S. National Congress on Theoretical and Applied Mechanics, Pennsylvania State University, State College, PA
- 2007 *Coordinator*, Micro and nanofabrication section of the NSF summer course on cell mechanosensitivity, University of Illinois at Urbana- Champaign, Urbana, IL

Journal Manuscript, Conference Paper and Proposal Review

- Nature Communications, Materials Research Letters, Scientific Reports, Scripta Materialia, Materials Science and Engineering A, Journal of Materials, Journal of Applied Mechanics, Extreme Mechanics Letters, Thin Solid Films, Modeling and Simulation in Materials Science and Engineering, Journal of Applied Physics, Journal of Microelectromechanical Systems, IEEE Transactions on Control Systems Technology, Journal of Visualized Experiments, Bioinspiration and Biomimetics
- National Science Foundation (CMMI 2014, 2016, ECCS 2012, DMR 2012)
- Naval Research Laboratory (2014)

UNIVERSITY, SCHOOL, AND DEPARTMENT SERVICE

2017	<i>Member</i> , Faculty Search Committee, Manufacturing and Mechanics of Advanced Materials search
2017	<i>Panelist</i> , SEMTE NSF CAREER Workshop
2016	<i>Reviewer</i> , Mechanical Engineering Program Assessment Fair
2014	<i>Member</i> , Faculty Search Committee, Advanced Materials/Manufacturing search
2012-present	<i>Member</i> , Solid Mechanics Curriculum Committee
2012	<i>Member</i> , Faculty Search Committee, Micro/Nano Systems search