

SANDEEP KUMAR

A305 Bourns Hall, University of California, Riverside, Riverside 92521

Phone: (951) 827 5832

E-mail: skumar@engr.ucr.edu

EDUCATION

- 2006 - 2012 Department of Mechanical & Nuclear Engineering, Pennsylvania State University
Doctor of Philosophy (PhD)
- 2004 - 2006 Department of Mechanical Engineering, Indian Institute of Technology, Delhi, India
Master of Science (Research)
- 1995 - 1999 Regional Engineering College, Kurukshetra, India
Bachelor of Technology in Mechanical Engineering

WORK EXPERIENCE

- 2012 – Present Assistant Professor, Mechanical Engineering, University of California, Riverside
- 2007 – 2012 Graduate Research Assistant, MNE Dept., Pennsylvania State University
- 2006 – 2007 Teaching Assistant, MNE Dept., Pennsylvania State University
- 2004 – 2006 Teaching Assistant, Dept. of Mech. Engg., IIT, Delhi, India
- 2002 – 2003 Project Scientist, Dept. of Mech. Engg., IIT, Delhi, India
- 1999 – 2002 Sales and Application Engineer, Fisher (India) Ltd. (presently Emerson Process Management), Baroda, India

PUBLICATIONS

Peer Reviewed Journal Publications

1. Bhardwaj, R.G., Lou, P.C. and Kumar, S., “Giant Enhancement in Rashba Spin-Seebeck Effect in NiFe/p-Si Thin Films” *physica status solidi (RRL) – Rapid Research Letters* (2018).
2. Lou, P.C. and Kumar, S., “Generation and detection of dissipationless spin current in a MgO/Si bilayer”, *Journal of Physics: Condensed Matter*, 2018. 30(14): p. 145801.
3. Bhardwaj, R.G., Lou, P.C. and Kumar, S., “Spin Seebeck effect and thermal spin galvanic effect in Ni₈₀Fe₂₀/p-Si bilayers” *Applied Physics Letters*, 2018. 112(4): p. 042404.
4. Lou, P.C. and Kumar, S., “Spin-Hall effect and emergent antiferromagnetic phase transition in n-Si”, *Journal of Magnetism and Magnetic Materials* 2018. 452: p. 129-133.
5. Lou, P.C. and Kumar, S., “Spin-driven emergent antiferromagnetism and metal insulator transition in nanoscale p-Si”, *physica status solidi (b)*, 2017: p. 1700545.
6. Lou, P.C., Beyermann, W. and Kumar, S., “Spin mediated magneto-electro-thermal transport behavior in Ni₈₀Fe₂₀/MgO/p-Si thin films”, *Journal of Applied Physics*, 2017. 122(12): p. 123905.
7. Lou, P.C. and Kumar, S., “Spin mediated enhanced negative magnetoresistance in Ni 80 Fe 20 and p-silicon bilayer”, *Solid State Communications* 24-28 (2017).

8. Garcia, D., Lou, P.C., Butler, J. and Kumar, S., "Spin-orbit torque induced reversible coercivity change in Co/Pd multilayer thin films", *Solid State Communications* 246: 1-4 (2016).
9. Garcia, D., Leon, A. and Kumar, S., "In-situ transmission electron microscope high temperature behavior in nanocrystalline platinum thin films", *JOM*, 68 (1), 109-115 (2016).
10. Garcia, D., Butler, J., Amos, N. and Kumar, S., "Electric current induced coercivity change in Co/Pd multilayer thin films" *Journal of Applied Physics* 118 (15), 153902 (2015).
11. Kumar, S., Garcia, D., Jin, J. and Haque, A., "Mechanical strain mediated carrier scattering and its role in charge and thermal transport in freestanding nanocrystalline aluminum thin films", *J. Vac. Sci. Technol. B*, 33, 022002 (2015).
12. Kumar, S., Alam, T., and Haque, A., "Thermo-mechanical coupling and size effects in micro and nano resonators", *Micro and Nano Systems Letters* 1, 2 (2013).
13. Kumar, S., Alam, T., and Haque, A., "Quantitative in-situ TEM study of stress-assisted grain growth". *MRS Communications FirstView*, 1 (2013).
14. Kumar, S., Haque, M.A. and Gao, H., "Transformation induced toughening and flaw tolerance in pure nanocrystalline aluminum", *International Journal of Plasticity* 44, 121 (2013).
15. Kumar, S., Joshi, K. L., van Duin, A. C. T. and Haque, M. A., "Can Amorphization Take Place in Nanoscale Interconnects?", *Nanotechnology*, Vol. 23, No. 9 (095701) 2012.
16. Kumar, S. and Haque, M. A., "In-Situ Transmission Electron Microscopy of Fracture in Notched Thin Films", *Journal of Nanoscience Letters*, Vol. 2: 26, 2012.
17. Kumar, S, Li, X, Haque, M and Gao, H, "Is Stress Concentration Relevant for Nanocrystalline Metals?", *Nano Letters*, 2011, Vol. 11, No. 6, pp 2510–2516, 2011.
18. Kumar, S, Alam, T, Connell, Z*. and Haque, M. A, "Deformation mechanism mapping for nanocrystalline platinum under electrical fields", *Scripta Materialia*, Vol. 65, pp. 277–280, 2011.
19. Kumar, S, Alam, M. T. and Haque, M. A., Fatigue Insensitivity of Nanoscale Freestanding Aluminum Films, *Journal of Microelectromechanical Systems*, Volume: 20 Issue:1, pp. 53 – 58, 2011.
20. Kumar, S, Wolfe, D. E. and Haque, M. A. "Dislocation Shielding and Flaw Tolerance in Titanium Nitride", *International Journal of Plasticity*, Volume 27, Issue 5, May 2011, Pages 739-747, 2011.
21. Manoharan, M. P., Kumar, S, Haque, M. A., Rajagopalan, R. and Foley, H. "Room temperature amorphous to nanocrystalline transformation in ultra-thin films under tensile stress: an in situ TEM study, *Nanotechnology* 21 (2010) 505707 (8pp).
22. Lee HF, Kumar S, Haque MA. "Role of mechanical strain on thermal conductivity of nanoscale aluminum films, *Acta Materialia*, Volume 58, Issue 20, pp. 6619-6627, 2010.
23. Kumar, S and Haque, M. A. "Fracture testing of nanoscale thin films inside the transmission electron microscope", *International Journal of Applied Mechanics*, Volume: 2, Issue: 4, pp. 745-758, 2010.
24. Kumar S, Zhuo D*, Wolfe D. E., Eades, A, Haque M. A. "Length-scale effects on fracture of multilayers", *Scripta Materialia*, Vol. 63, pp. 196-199, 2010.

25. Kumar, S. and M. A. Haque, "Stress-dependent thermal relaxation effects in micro-mechanical resonators," *Acta Mechanica* 212 (1), 83-91, 2009.
26. Kumar, S, Haque, M.A, and Gao, H, "Notch insensitive fracture in nanoscale thin films," *Applied Physics Letters* 94 (25), 253104-253103, 2009.
27. Kumar, S and Haque, M.A, "Reduction of thermo-elastic damping with a secondary elastic field," *Journal of Sound and Vibration* 318 (3), 423-427, 2008.

Conference Proceedings/Presentations

1. Kumar, S. and Lou, P C., "Spin Hall effect in p-Si", presentation, APS March Meeting 2017.
2. Kumar, S. and Lou, P C., "Magneto-electro-thermal characterization of thin films", poster, MRS Fall Meeting 2016.
3. Kumar, S. and Lou, P C., "Spin mediated enhanced negative magnetoresistance in Ni₈₀Fe₂₀ and p-silicon bilayer", presentation, MRS Fall Meeting 2016.
4. Kumar, S. and Lou, P C., "Spin mediated enhanced negative magnetoresistance in Ni₈₀Fe₂₀ and p-silicon bilayer", presentation, Magnetism and Magnetic Materials (MMM) 2016.
5. Kumar, S. and Lou, P C., "Electro-magneto-thermal characterization of ferromagnetic thin films", presentation, APS March Meeting 2016.
6. Kumar, S., Garcia, D. and Lou, P C., "Spin-orbit torque induced reversible coercivity change in Co/Pd multilayer thin films" presentation, MRS Spring Meeting 2016.
7. Kumar, S., Garcia, D., Jin, J. and Haque, A., "In-situ TEM mechanical strain mediated carrier scattering and its role in charge and thermal transport" presentation, MRS spring meeting 2015.
8. Haque, A., Kumar, S. and Alam, T., "A MEMS based platform for multi-physics characterization of ultra-thin freestanding films" *ECS Transactions* 50 (12), 487-494 (2013).
9. Kumar, S. and Haque, A., "In-situ TEM high temperature behavior in nanoscale Pt thin films" presentation, MRS fall meeting 2014.
10. Kumar, S. and Haque, A., "In-situ TEM high temperature behavior in nanoscale Pt thin films" presentation, 17th US National Congress on Theoretical and Applied Mechanics 2014.
11. Kumar, S., Alam, T., and Haque, A., "Quantitative In-situ TEM Study of Stress Assisted Grain Growth" presentation, SES/ASME-AMD Summer meeting 2013.
12. Kumar, S., Gao, H., and Haque, A., "Transformation Induced Toughening in Pure Nanocrystalline Aluminum" presentation, SES/ASME-AMD Summer meeting 2013.
13. Kumar, S., Alam, T., and Haque, A., "Stress Concentration Induced Grain Growth Mechanism in Nanocrystalline Platinum Thin Films", presentation, MRS Spring meeting 2013.
14. Kumar, S and Haque, M.A, "In-situ TEM Thermo-Electro-Mechanical Characterization of Nanoscale Thin Films", presentation, MRS Fall meeting 2012.
15. Kumar, S and Haque, M.A, "Multi physics of thin films", Presentation, ASME IMECE-2012.
16. Kumar, S and Haque, M.A, "In-situ TEM thermo-electro-Mechanical characterization of nanoscale Aluminum Thin Films", Presentation, ASME IMECE-2011.
17. Kumar, S and Haque, M.A, "Solid-state partial amorphization and recrystallization in Aluminum thin films", Presentation, ASME IMECE-2011.

18. Kumar, S and Haque, M.A, "Face Centered Cubic to Hexagonal ω Phase Transformation in Pure Nanocrystalline Aluminum", Presentation, ASME IMECE-2011.
19. Kumar, S, Haque, M.A, and Gao, H, "Flaw Insensitivity in nanoscale thin films", Presentation, ASME IMECE-2010.
20. Kumar, S and Haque, M.A, "*In-situ* TEM fracture Testing of nanoscale Ti/TiN thin films", Presentation, ASME IMECE-2010.
21. Kumar, S and Haque, M.A, "Absence of Strain Gradient in nanoscale metallic thin Films", Presentation, ASME IMECE-2010.
22. Kumar, S and Haque, M.A, "*In-situ* TEM Electromigration studies on Nanoscale Aluminum thin films", Presentation, ASME IMECE-2010.
23. Kumar, S and Haque, M.A, "Size effects and Stress Dependence of Thermal Relaxation Time", Presentation, ASME IMECE-2009.
24. Kumar, S and Haque, M.A, "*In-situ* TEM fracture testing of Ti-TiN multilayer thin film", Presentation, ASME IMECE, 2009.
25. Kumar, S and Haque, M.A, "*In-situ* TEM Tensile Testing of nanoscale Aluminum thin film", Presentation, ASME IMECE, 2009.
26. Kumar, S and Haque, M.A, "*In-situ* TEM Studies of Size Effects in Thin Films", Presentation. 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials.
27. Kumar, S and Haque, M.A, "Thermoelastic Damping in Pre-Stressed Resonators", Presentation ASME IMECE 2008
28. Kumar, S and Haque, M.A, "Thermoelastic Damping in Axially Stressed Beams", IDETC 2008.
29. Kumar, S, Modak, S V and Kundra, T K, "Model Updating Studies on a Two- Wheeler Chassis", SAE 2007 Noise and Vibration Conference and Exhibition, 2007-01-2353.
30. Kumar, S, Kundra, T.K and Nakra, B.C, "Studies on Operational Modal Analysis using SLDV", Proc. IMAC XXIV, 2006

GRANTS AND AWARDS

- 2013-14 Academic Senate Regents Fellowship.

SERVICE

- Member of ME Undergraduate Committee, 2012-13.
- Member of ME Graduate Committee, 2012-14.

HONORS

- Awarded 'Graduate Teaching Fellowship' for spring, 2012 by Mech. And Nuc. Engg. Dept.
- 'Graduate School Alumni Association Dissertation Award', awarded by Graduate School, Penn State University, 2010.

- Alam, T, Jin, J, Kumar, S, and Haque, A, “Thermo-mechanical Coupling in Nanoscale Thin Films”, Micro/Nano Society Wide Forum Poster Competition ASME-IMECE 2010- Innovation Award
- Kumar, S, and Haque, A, “*In-situ* TEM Tensile/Fracture Testing of Nanoscale Thin Films”, Micro/Nano Society Wide Forum Poster Competition ASME-IMECE 2009- Honorable Mention
- Kulakowski Travel Award, Department of Mechanical & Nuclear Engineering, Pennsylvania State University, 2009

LEADERSHIP & COLLABORATIVE ROLES

Session co-chair for ASME International Mechanical Engineering Conference and Exposition (IMECE), Denver 2011

Reviewer for ASME International Mechanical Engineering Conference and Exposition (IMECE), Denver 2011

Manuscript reviewed for Journal of Sound and Vibration, International Journal of Plasticity, Applied Spectroscopy, AIP Advances, International Journal of Fracture, JVST (B), JMMM and JOM.