Curriculum Vitae: Pradeep Sharma

EDUCATION:
1990–1994
Bachelor of Science in Mechanical Engineering**,** August 1995
M.S. University of Baroda, India

2000
M.S. in Mechanical Engineering, University of Maryland at College Park.

1995–2000
Ph.D. in Mechanical Engineering, August 2000
University of Maryland, College Park

PROFESSIONAL ACCREDITATION:
Chartered Physicist (Ch.Phy.)---Institute of Physics, London, UK, 2003
Professional Engineer (P.E.)---registered in the State of Texas. Since 2016.

PROFESSIONAL EXPERIENCES:
2012 - present, M.D. Anderson Professor and Department Chair, Department of Mechanical Engineering, University of Houston, TX
2008-2011, Bill Cook Endowed Associate Professor, Department of Mechanical Engineering, University of Houston, TX

2005-2008, Bill Cook Endowed Assistant Professor, Department of Mechanical Engineering, University of Houston, TX

Jan 2004-present, Assistant Professor, Department of Mechanical Engineering, University of Houston, TX

September 2000– October 2003, Research Scientist, General Electric Corp. R & D, Schenectady, NY

AWARDS AND HONORS:

(1) ONR Young Investigator Award, 2005
(2) Bill D. Cook Faculty Endowed Chair, 2005
(3) Texas Space Grants Consortium New Investigators Program Award, 2005
(4) University of Houston, Excellence in Research and Scholarship Award, Assistant Professor Level, 2006
(5) University of Houston, Cullen College of Engineering Junior Faculty Award, 2007
(6) Guest Editor: *Mathematics and Mechanics of Solids*, 2007 (special issue on size-effects in mechanics)
(7) Founding Editor: iMechanica Journal Club, 2007
(8) Selected as one of the Top Referees (2009); *Proceedings of the Royal Society*
(9) Thomas J.R. Hughes ASME Young Investigator Award[1], 2009; **Citation**: "*For outstanding contributions to understanding size-effects of coupled mechanical and physical phenomena in materials*".
(10) Faculty of the Year award by local ASME student chapter—2010

[1] Awarded annually by the ASME to a mechanician under 40.

(11) University of Houston, Excellence in Research and Scholarship Award, Associate Professor Level, 2011
(12) Distinguished M.D Anderson Professorship, 2012
(13) Fulbright Award, 2013
(14) ASME Melville Medal, 2015
(15) ASME Fellow, 2013
(16) University of Houston Teaching Award, 2013
(17) President, Society of Engineering Science, 2015
(18) Associate Editor: *Journal of the Mechanics and Physics of Solids*
(19) (past) Associate Editor**:** *Journal of Theoretical and Computational Nanoscience*
(20) (past) Associate Editor: *Journal of Applied Mechanics*
(21) Editorial Board Member: International Journal of Applied Mechanics, Mathematics and Mechanics of Solids

PATENTS

(1) Monolithic light emitting devices based on wide bandgap semiconductor nanostructures and methods for making same; US Patent Issued on October 17, 2006
(2) Fabrication of self-assembling nanostructures; US Patent issued on March 27, 2008

BOOK CHAPTERS

(Invited) R. Maranganti, and **P. Sharma**, "A Review of Strain Field Calculations in Embedded Quantum Dots and Wires", Chapter 118, *Handbook of Theoretical and Computational Nanotechnology*, Michael Reith and Wolfram Schommers (eds.), 2006

(**Invited**) Q. Deng, L. Liu, and P. Sharma, "A Continuum Theory of Flexoelectricity", Chapter 3, *Flexoelectricity in Solids: From Theory to Applications*, A.K. Tagantsev and P.V. Yudin (eds.), 2017

SELECTED REFEREED JOURNAL PUBLICATIONS: out of 102 total; Reprints and preprints of most listed papers are available on the following website: http://sharma.me.uh.edu

ASTERIX * indicates graduate student advised or **co-advised funded.

1. L. Liu, **P. Sharma**. "Emergent electromechanical coupling of electrets and some exact relations—the effective properties of soft materials with embedded external charges and dipoles.", *Journal of the Mechanics and Physics of Solids*, **112**, 1-24, 2018
2. X. Yan, A. Gouissem, P. Guduru, **P. Sharma**. "Elucidating the atomistic mechanisms underpinning plasticity in Li-Si nano-structures", *Physical Review Materials*, 055401(1-9), 2017
3. M. Zelisko, F. Ahmadpoor, H. Gao, P. Sharma. "Determining the Gaussian modulus and edge properties of 2D materials from graphene to lipid bilayers", *Physical Review Letters*, **119**, 068002(1-6), 2017
4. S. Yang, X. Zhao, **P. Sharma**. "Avoiding the pull-in instability of a dielectric elastomer film and the potential for increased actuation and energy harvesting", *Soft Matter*, **13**, 4552 – 4558, 2017

5. F. Ahmadpoor, P. Wang, R. Huang, **P. Sharma**. "Thermal fluctuations and effective bending stiffness of elastic thin sheets and graphene: A nonlinear analysis", *Journal of the Mechanics and Physics of Solids*, **107**, 294–319, 2017
6. S. Yang, X. Zhao, P. Sharma, "Revisiting the instability and bifurcation behavior of soft dielectrics", *Journal of Applied Mechanics*, **84**, 2017
7. X. Yan*, **P. Sharma**, "Time Scaling in Atomistics and the Rate-dependent Mechanical Behavior of Nanostructures", *Nano Letters*, **16**, 3487–3492, 2016
8. S. Krichen*, **P. Sharma**, "Flexoelectricity: a Perspective on an Unusual Electromechanical Coupling", *Journal of Applied Mechanics*, **83**, 030801(1-5), 2016
9. F. Ahmadpoor*, **P. Sharma**, "Thermal Fluctuations of Vesicles and Nonlinear Curvature Elasticity-implications for Size-dependent Renormalized Bending Rigidity and Vesicle Size Distribution", *Soft Matter*, **12**, 2523-2536, 2016
10. X. Li, L. P. Liu, **P. Sharma**, "A New Type of Maxwell Stress in Soft Materials Due to Quantum Mechanical-elasticity Coupling", *Journal of the Mechanics of Physics of Solids*, **87**, 115-129, 2016
11. H. Agrawal*, M. Zelisko*, L. Liu, **P. Sharma**, "Rigid Proteins and Softening of Biological Membranes–with Application to HIV-Induced Cell Membrane Softening", *Scientific Reports*, **6**, 25412(1-12), 2016
12. F. Ahmadpoor*, **P. Sharma**, "Flexoelectricity in Two-dimensional Crystalline and Biological Membranes", *Nanoscale*, **7**, 16555-16570, 2015
13. X. Li, L. P. Liu, **P. Sharma**, "Geometrically Nonlinear Deformation and the Emergent Behavior of Polarons in Soft Matter", *Soft Matter*, **11**, 8042-8047, 2015
14. Y. Liu, H. Cai, M. Zelisko, Y. Wang, J. Sun, F. Yan, F. Ma, Pwang, Q. N. Chen, H. Zheng, X. Meng, **P. Sharma**, Y. Zhang, J. Li, "Ferroelectric switching of elastin", *Proceedings of the National Academy of Sciences*, **111 (27)** ,E2780-E2786, 2014
15. M. Zelisko, Y. Hanlumyuang, S. Yang, Y. Liu, C. Lei, J. Li, P. M. Ajayan, **P. Sharma**, "Anomalous piezoelectricity in two-dimensional graphene nitride nanosheets", *Nature Communications*, **5:4284**, 2014
16. Q. Deng, L. P. Liu, **P. Sharma**, "Electrets in soft materials: Nonlinearity, size effects, and giant electromechanical coupling", *Physical Review E*, **90**, 012603, 2014
17. Y. Hanlumyuang, X. Li, **P. Sharma**, "Mechanical strain can switch the sign of quantum capacitance from positive to negative", *Physical Chemistry Chemical Physics*, **16(42)**, 22962-22967, 2014
18. Q. Deng, L.P. Liu, **P. Sharma,** "Flexoelectricity in soft materials and biological membranes", *Invited Paper for Sixtieth anniversary issue in honor of Professor Rodney Hill, Journal of the Mechanics of Physics of Solids*, **62**, 209-227, 2014
19. Boron Nitride – Graphene Nanocapacitor and the Origins of Anomalous Size-dependent Increase of Capacitance, G. Shi, Y. Hanlumyuang, Z. Liu, Y. Gong, W. Gao, J. Lou, R. Vajtai, **P. Sharma**, P.M. Ajayan, *Nano Letters*, **14**, 1739-1744, 2014
20. P. Mohammadi, L.P. Liu, **P. Sharma**, " A theory of flexoelectric membranes and effective properties of heterogeneous membranes", *Journal of Applied Mechanics*, **81**, 011007-2, 2014
21. Q. Deng, M. Kammoun, A. Erturk, **P. Sharma**, "Nanoscale flexoelectric energy harvesting", *International Journal of Solids and Structures*, **51**, 3218-3225, 2014
22. Y. Hanlumyuang, L.P. Liu, **P. Sharma**, "Revisiting the entropic force between fluctuating biological membranes", *Journal of the Mechanics of Physics of Solids*, **63**, 179-186, 2014
23. R. Mbarki, N. Baccam, Kaushik Dayal, **P. Sharma**, "Piezoelectricity above the Curie temperature? Combining exoelectricity and functional grading to enable high-temperature electromechanical coupling", *Applied Physics Letters*, **104**, 122904, 2014

24. **P. Sharma**, " Entropic force between membranes reexamined", *Proceedings of the National Academy of Sciences*, 110(6), 1976-1977, 2013
25. L.P. Liu, **P. Sharma**, " Giant and universal magneto-electric coupling in soft materials and the concomitant ramifications for materials science and biology", *Physical Review E*, 88, 040601(R), 2013
26. L.P. Liu and **P. Sharma**, "Flexoelectricity and thermal fluctuations of lipid bilayer membranes: Renormalization of flexoelectric, dielectric, and elastic properties", *Physical Review E*, 87, 032715, 2013
27. Z. Liu, Y. Zhan, S. Moldovan, M. Gharbi*, L. Song, G. Shi, L. Ma, W. Gao, S. Zhao, J. Huang, R. Vajtai, F. Banhart, **P. Sharma**, J. Lou, P.M. Ajayan, "Anomalous High Capacitance in a Coaxial Nanowire Capacitor", *Nature Communications*, 3:879, 2012
28. S. Chandratre***, P. Sharma**, "Coaxing Graphene to be Piezoelectric", *Applied Physics Letters,* 100, 023114-1-023114-3, 2012
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38. R. Maranganti* and **P. Sharma**, "Atomistic Determination of Flexoelectric Properties of Crystalline Dielectrics", *Physical Review. B* 80 , 054109, 2009
39. **(Invited)** A. K. Tagantsev, V. Meunier, and **P. Sharma**, "Novel Electromechanical Phenomena at the Nanoscale: Phenomenological Theory and Atomistic Modeling", *MRS bulletin*, volume 34 , 2009
40. F. Shi*, **P. Sharma** and G.H. Gunaratne, "How To Create Perfectly Ordered Quantum Dots via Self-Assembly, *Chaos*, 19 , 033141 ,2009
41. X. Zhang*, M. Gharbi*, **P. Sharma**, and H. T. Johnson, "Quantum Field Induced Strains in Nanostructures and Prospects for Optical Actuation", *International Journal of Solids and Structures*, 46,3810–3824, 2009
42. M.S. Majdoub*, **P. Sharma** and T. Cagin, Enhanced Size-Dependent Piezoelectricity And Elasticity in Nanostructures Due to The Flexoelectric Effect", *Physical Review B***,** 77, 125424-1 – 125424-9, 2008

43. M.S. Majdoub*, **P. Sharma** and T. Cagin, "Dramatic Enhancement in Energy Harvesting For a Narrow Range of Dimensions in Piezoelectric Nanostructures", *Physical Review B***,** 78, 121407 (R), 2008
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45. F. Shi*, **P. Sharma**, D.J. Kouri, F. Hussain and G.H. Gunaratne, "Nanostructures with Long-Range Order in Monolayer Self-Assembly ", *Physical Review E*, 78, 025203, 2008
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47. X.Zhang*, **P.Sharma** and H.T.Johnson, "Quantum Confinement Induced Strain in Quantum Dots", *Physical Review B*, **75**, 155319-1– 155319-8, 2007
48. N.D. Sharma*, R. Maranganti* and **P. Sharma**, "On the Possibility of Piezoelectric Nanocomposites without using Piezoelectric Materials", *Journal of the Mechanics and Physics of Solids*, **55**, 2328–2350, 2007
49. R. Maranganti* and **P. Sharma**, "A Novel Atomistic Approach to Determine Strain Gradient Elasticity Constants: Tabulation and Comparison for Various Metals, Semiconductors, Silica, Polymers and the (lr) relevance for Nanotechnologies", *Journal of the Mechanics and Physics of Solids*, Vol. 55, issue 9, p. 1823-1852, 2007
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51. **(Invited Review Article)** R.Maranganti*, **P.Sharma**, and L.Wheeler, "Quantum Notion of Stress"*, Journal of Aerospace Engineering,* **20**, 22– 37, 2007
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63. **P. Sharma**, and S. Ganti, “Gauge-field-theory Solution of the Elastic State of a Screw Dislocation in a Dispersive (non-local) Crystalline Solid ",*Proceedings of the Royal Society*, **461**, 1081, 2005
64. **P. Sharma**, A. Dasgupta, and G.Cuddalorepatta**, "The Connection Between Microstructural Damage Modeling and Continuum Damage Modeling for Eutectic Sn-Pb Solder Alloys", accepted, *International Journal of Damage Mechanics,* 14, 343-363, 2005
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66. **P. Sharma**, S. Ganti, H. Ardebili, A. Alizadeh, “Scaling of Thermal Stresses in Passivated Nano-interconnects”, *Journal of Applied Physics*, **95**, No. 5, p 2763, 2004
67. **P. Sharma** and S. Ganti, “Size-dependent Eshelby’s Tensor for Embedded Nano-inclusions Incorporating Surface/Interface Energies”, *Journal of Applied Mechanics*, Vol 71, 663, 2004
68. **P. Sharma**, “Inclusions and Defects in Chiral Solids”, *International Journal of Solids and Structures*, **41**,6317, 2004
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76. **P. Sharma**, H. Ardebili and J. Loman, “A Note on the Thermal Stresses in Passivated Metal Interconnects”, *Applied Physics Letters*, Vol. 79, No. 11, p 1706, 2001