ZOUBEIDA OUNAIES

Distinguished Professor of Mechanical Engineering
Professor of Materials Science and Engineering
Director, Convergence Center for Living Multifunctional Material Systems
Associate Director, Materials Research Institute
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EDUCATION

Ph.D. in Engineering Science and Mechanics, The Pennsylvania State University, 1996
M.S. in Mechanical Engineering, The Pennsylvania State University, 1991
B.S. in Mechanical Engineering, The Pennsylvania State University, 1990

ACADEMIC POSITIONS

Distinguished Professor of Mechanical Engineering, Department of Mechanical Engineering, Penn State University (01/2025 – Present)

Professor of Mechanical Engineering, Department of Mechanical Engineering, Penn State University (07/2015 – Present)

Professor of Materials Science and Engineering, Department of Materials Science and Engineering, Penn State University (07/2024 – Present)

Associate Professor of Mechanical Engineering, Department of Mechanical Engineering, Penn State University (01/2011 – 06/2015)

Dorothy Quiggle Career Development Professor, Department of Mechanical Engineering, Penn State University (01/2011 - 12/2013)

Associate Professor of Aerospace Engineering, Department of Aerospace Engineering, Texas A&M University (09/2009 – 12/2010)

Associate Professor of Material Science and Engineering, Materials Science and Engineering Program, Texas A&M University (09/2009 – 12/2010)

Edward "Pete" Aldridge Jr. '60 Career Development Professor, Department of Aerospace Engineering, Texas A&M University (01/2009-12/2010)

Assistant Professor of Aerospace Engineering, Department of Aerospace Engineering, Texas A&M University (01/2005 – 08/2009)

Assistant Professor of Material Science and Engineering, Department of Aerospace Engineering, Texas A&M University (01/2005 – 08/2009)

Graduate Program Director, Department of Mechanical Engineering, Virginia Commonwealth University (08/2001 – 12/2004)

Assistant Professor of Mechanical Engineering, Department of Mechanical Engineering, Virginia Commonwealth University (01/2001 – 12/2004)

Senior Staff Scientist, ICASE/NASA Langley Research Center, Hampton, VA. Advanced Materials Branch (01/1999 – 12/2000)

Staff Scientist, ICASE/NASA Langley Research Center, Hampton, VA. Advanced Materials Branch (01/1998 – 12/1998)

National Research Council Postdoctoral Research Associate, NASA Langley Research Center, Hampton, VA. Advanced Materials Branch (08/1996-12/1997)

RESEARCH AREAS AND IMPACT

Expertise in multifunctional materials with life-like attributes; Responsive polymer-based materials with unique combinations of mechanical, electrical, magnetic, and coupled properties; Dielectric materials for sensing, actuation, energy storage and energy harvesting; Manipulation of colloidal nano- and micro-particles.

- Developed a robust research program in the synthesis/processing and property/performance relationships of responsive soft materials for applications ranging from aerospace systems to robotics and healthcare.
- Secured over $25M in external research funding.
- Published >85 peer-reviewed journal papers.
- Advised 6 postdocs, 18 Ph.D., 20 M.S., >40 undergraduate students in research.

ACADEMIC AND PROFESSIONAL ORGANIZATION LEADERSHIP

Director, Convergence Center for Living Multifunctional Material Systems (2020-Present)

- Spearheading a cutting-edge research center in innovative materials systems, continuously shaping strategic priorities and driving impactful research while ensuring efficient academic administration
- Cultivating and expanding global research collaborations, with a particular focus on strengthening ties with the University of Freiburg
- Orchestrating a dynamic seed grant program that catalyzes collaborative research initiatives between Penn State and the University of Freiburg, fostering international academic synergies
- Leading an NSF-funded summer research internship program, facilitating ongoing exchange of top-tier researchers between the United States and Germany, enhancing cross-cultural scientific innovation

Associate Director, Materials Research Institute, Penn State University (07/2022 – Present)

- Championing research excellence and faculty advancement
- Leading comprehensive mentoring initiatives for early career faculty, fostering a culture of continuous growth and innovation
- Orchestrating dynamic efforts to build and strengthen diverse research communities, enhancing collaborative synergies across disciplines
- Steering the strategic direction and implementation of the multidisciplinary MRI seed fund program, catalyzing groundbreaking research endeavors
- Actively contributing to MRI's strategic vision and operations as a member of the leadership committee
- Spearheading the expansion and integration of diversity, equity, inclusion, and belonging initiatives within MRI's research ecosystem, driving transformative change

Acting Director, Materials Research Institute, Penn State University (01/2023 – 12/2023)

- Provided comprehensive research and administrative leadership, continuously adapting to evolving academic landscapes
- Shaped and implemented strategic research priorities, ensuring the institute remains at the forefront of innovation
- Orchestrated budget management and financial forecasting for a major research institute, optimizing resource allocation for maximum impact
- Oversaw core facilities operations, enhancing research capabilities and technological infrastructure
- Cultivated a world-class team through strategic hiring and retention of administrative and technical staff
- Championed co-hiring initiatives and retention strategies for faculty members, fostering academic excellence
- Forged strong partnerships with colleges and campuses to elevate faculty recruitment, retention, and mentoring programs

Associate Department Head for Administration, Department of Mechanical Engineering, Penn State University (08/2016 – 06/2020)

- Designed and led the faculty mentoring program
- Headed strategic faculty recruitment initiatives
- Actively shaped departmental policy and direction as a member of the executive committee
- Liaised with other departments and external stakeholders, enhancing collaborative opportunities
- Curated a dynamic portfolio of workshops and training programs, elevating faculty professional development
- Championed comprehensive diversity initiatives, fostering an inclusive academic environment that drives innovation and excellence
- Ensured equitable practices and transparency in hiring and promotion processes

Chair, SPIE Smart Structures and Materials/NonDestructive Evaluation International Conference (2019-2021)

- Provided academic and programmatic leadership for this significant event
- Cultivated a roster of world-class keynote speakers and presenters
- Championed rigorous scientific standards through meticulous peer review processes and presentation quality control
- Forged strategic collaborations with SPIE staff, organizing committee members, sponsors, and industry partners
- Served as the principal ambassador for the conference, elevating its profile within the global scientific community
- Steered continuous improvement through post-conference evaluations and implementation of strategic enhancements

Chair, American Society of Mechanical Engineers Aerospace Division (2017-2019)

- Chaired one of the largest divisions within ASME (>5000 members) and facilitated the Aerospace Division Executive Committee meetings, guiding strategic decision-making and ensuring effective governance of the division's activities and initiatives
- Oversaw the planning of technical conferences, publications, and the division's Honors & Awards program
- Spearheaded collaborations with industry partners, representing ASME Aerospace Division at key events to enhance its global influence and promote knowledge exchange

Chair, American Society of Mechanical Engineers Adaptive Structures and Materials Systems Branch (2012-2013)

- Led the transition of ASMS from a technical committee to a professional branch within the American Society of Mechanical Engineers
- Coordinated activities and initiatives to advance the field of adaptive structures and materials and engage ASME ASMS members
- Participated-in and co-sponsored several technical conferences, awards and discipline-related service activities and outreach.

HONORS AND AWARDS (SELECTED)

- Distinguished Professor, College of Engineering, Penn State University (2025-present)
- Outstanding International Research Award, Advancing Global Penn State (2024)
- Fellow, Executive Leadership in Academic Technology, Engineering and Science (ELATES), (2021-2022)
- Active Materials and Soft Mechatronics Academic Award, The 4th International Conference on Active Materials and Soft Mechatronics (AMSM), (2019)
- Commission for Women's Rosemary Schraer Mentoring Award Recipient (2019)
- SPIE Fellow, The International Society for Optics and Photonics (2019)
- Fellow, Big Ten Academic Alliance Leadership Program (ALP) (2017-2018)

- ASME Fellow, American Society of Mechanical Engineers (2016)
- PSEAS Outstanding Research Award, Penn State Engineering Alumni Society (2016)
- Best Paper Award in Materials, Adaptive Structures and Materials Systems Branch, Aerospace Division, ASME (2015)
- Holder of the Dorothy Quiggle Faculty Development Professorship (2011)
- H.J.E. Reid Award for Best Paper, NASA Langley Research Center's highest award (2010)
- Inaugural Holder of the Edward "Pete" Aldridge Jr. '60 Career Development Professorship (2009)
- Best Paper Award in Materials, Adaptive Structures and Materials Systems Technical Committee, Aerospace Division, ASME (2009)
- Richard T. Whitcomb and Paul F. Holloway Technology Transfer Award, NASA Langley Research Center, Hampton, VA (2009)
- National Science Foundation CAREER Award (2007)
- TEES Select Texas Engineering Experiment Station Young Faculty Award, Texas A&M University. College-wide award given by the Dean of College of Engineering at TAMU to recognize outstanding young faculty members for their research achievements and contributions (2007)
- Montague Center for Teaching Excellence (CTE) Scholar (2007)
- Texas Space Grants Consortium New Investigators Program Award (2006)
- NASA Langley Space Act Award for Development of Electrospun Electroactive Polymers (2005)

PEER REVIEWED JOURNAL PUBLICATIONS

86. M. Zamani and **Z. Ounaies**, "3D Printing of Magnetoactive Epoxy Shape Memory Composites: Correlating Rheology, Printability, and Shape Fidelity", Journal of Polymer Research, 32, 33, 2025), https://doi.org/10.1007/s10965-024-04247-2.
85. O. Moronkeji, F. Sozio, K. Ghosh, A. Meddeb, A. Farahani, **Z. Ounaies**, I. Chasiotis, and O. Lopez-Pamies, "The Nonlinear Elastic Deformation of Liquid Inclusions Embedded in Elastomers." Soft Condensed Matter, submitted, 2024, *arXiv preprint arXiv:2411.16363*.
84. C. Bergen, **Z. Ounaies**, and P. von Lockette, "Performance Enhancement of Magnetoactive Elastomer Soft Robots through a Coupled Magnetoelastic Topology Optimization Scheme." Smart Mater. Struct., 33, 125012, 2024, 10.1088/1361-665X/ad8b89.
83. J.M. Song, M. Latif, Y. Jiang, and **Z. Ounaies**, and J. Kim, "High-performance flexible triboelectric nanogenerator based on micropatterned allicin-grafted cellulose film." Materials Today Nano, 2024, Vol. 26,100475.
82. X. Zhao, and **Z. Ounaies**, "Role of Mechanical Properties in the Triboelectric Behavior of Polymers for Wearable Triboelectric Nanogenerators." ACS Applied Electronic Materials, 2024, https://doi.org/10.1021/acsaelm.3c01826.
81. E. Vazquez, **Z. Ounaies**, E. Iatesta, and J. Duarte, "Magnetic Actuation of Bistable Flaps for Kinetic Building Shades." Construction and Building Materials, 392:132028, 2023, https://doi.org/10.1016/j.conbuildmat.2023.132028.
80. T. Pan, R. Leng, O. Uitz, C. Seepersad, **Z. Ounaies**, and M. Frecker, "Analytical Modeling of a Magnetoactive Elastomer Unimorph.", Smart Mater. Struct., 32(9): 0950212023, 2023, 10.1088/1361-665X/acece7
79. O. Uitz, R. Leng, T. Pan, X. Zhao, A. Oridate, C. Seepersad, **Z. Ounaies**, and M. Frecker, "Reactive extrusion additive manufacturing (REAM) of functionally graded, magneto-active thermoset composites.", Additive Manufacturing, 67: 103486, 2023, https://doi.org/10.1016/j.addma.2023.103486

78. A. Barhoumi Meddeb, and **Z. Ounaies**, "Interphase-Assisted Suppression of Electrode Polarization in Nanoparticulate-Elastomeric Composites." Journal of Applied Physics, 133(15): 155106, 2023, https://doi.org/10.1063/5.0141243
77. M. Al Masud, D. Papula, A. Erol, C. Edson, D. Widdowson, P. von Lockette, and **Z. Ounaies**, "Combined Magnetic and Electric Field Processing of Polymer Matrix Composites for Orthogonal Control of Hierarchical Particle Arrangements." Smart Materials and Structures, 32(2): 025001, 2022, 10.1088/1361-665X/aca6be
76. E. Heatherington, X. Zhao, N. Goyal, **Z. Ounaies**, and M. Frecker, "On the Design and Testing of an Origami Inspired Nasal Cover: Mitigating Aerosol Risks During Endoscopic Sinus Procedures." ASME. J. Med. Devices, 16(4): 041011, 2022.
75. X. Zhao and **Z. Ounaies**, "A Facile Method to Enhance the Flexibility and Triboelectric Output of PDMS Using Ionic Liquid-Coated Single-Wall Carbon Nanotubes", Nano Energy, Available online 31 December 2021, https://doi.org/10.1016/j.nanoen.2021.106908, 2022.
74. W. Zhang, S. Ahmed, J. Hong, **Z. Ounaies**, and M. Frecker, "A Two-Stage Design Optimization Framework for Multifield Origami-Inspired Structures", *Journal of Intelligent Material Systems and Structures*, 33 (1), 46-69, 2022.
73. D. Adams, **Z. Ounaies**, and A. Basak, "Printability Assessment of Ethyl Cellulose Biopolymer Using Direct Ink Writing", *JOM Special Issue: Additive Manufacturing for Medical Applications*, 73, 3761–3770, 2021.
72. I., Chae, R., Zu, A., Meddeb, Y., Ogawa, Z., Chen, V., Gopalan, **Z. Ounaies**, and S. Kim, "Electric Field-Induced Polarization Responses of Noncentrosymmetric Crystalline Biopolymers in Different Frequency Regimes–A Case Study on Unidirectionally Aligned β-Chitin Crystals", Biomacromolecules, 22(5): 1901, 2021, DOI: 10.1021/acs.biomac.0c01799.
71. A. Meddeb, I. Chae, F. Scurti, J. Schwartz, S. Kim, and **Z. Ounaies**, "From a Cholesteric Non-Aqueous Cellulose Nanocrystal Suspension to a Highly Ordered Film", *MRS Advances*, DOI: https://doi.org/10.1557/adv.2020.404, 1-8, 2020.
70. I. Chae, D. Ngo, Z. Chen, A. L Kwansa, X. Chen, A.Meddeb, Ni. Podraza, Y. Yingling, **Z. Ounaies**, and S. Kim, "Anisotropic Optical and Frictional Properties of Langmuir–Blodgett Film Consisting of Uniaxially-Aligned Rod-Shaped Cellulose Nanocrystals", *Advanced Materials Interfaces*, 7 (9), 1902169, 2020.
69. A. Meddeb, I. Chae, A. Han, S. Kim, and Z. Ounaies, "Magnetic field effects on cellulose nanocrystal ordering in a non-aqueous solvent", *Cellulose*, 27 (14), 7901-7910, 2020.
68. I. Chae, D. Ngo, M. Makarem, **Z. Ounaies**, and S. Kim, "Compression-Induced Topographic Corrugation of Air/Surfactant/Water Interface: Effect of Nanoparticles Adsorbed Beneath the Interface", *J. Phys. Chem. C*, DOI: 10.1021/acs.jpcc.9b05220, 2019.
67. M. Vecchio, A. Meddeb, **Z. Ounaies** and M. Lanagan, "Conduction Through Plasma-Treated Polyimide: Analysis of High-Field Conduction by Hopping and Schottky Theory", *J. Mater. Sci.*, 54, 10548-10559, 2019.
66. A. Kadimi, H. Kaddami, **Z. Ounaies**, Y. Habibi, R. Dieden, B. Ameduri, M. Raihane, "Preparation and Dielectric Properties of Poly(Acrylonitrile-Co-2,2,2-Trifluoroethyl Methacrylate) Materials Via Radical Emulsion Copolymerization", *Polym. Chem.*, 2019.
65. A. Meddeb, **Z. Ounaies**, O. Lopez-Pamies, and T. Tighe, "Extreme Enhancement of the Nonlinear Elastic Response of Elastomer Nanoparticulate Composites Via Interphases", *Composites Part B: Engineering*, 156, 166-173, 2019.
64. A. Erol, S. Ahmed, **Z. Ounaies**, And P. Von Lockette, "A Microstructure-Based Approach To Modeling Electrostriction That Accounts For Variability In Spatial Locations Of Domains", *Int. J. of Solids and Struc.*, 124, 35-62, 2019.
63. M. Sarkarat, A. Meddeb, S. Komarneni, and **Z. Ounaies**, "Impact of Stabilizer on In-Situ Formation Of Ag Nanoparticles In Polyvinylidene Fluoride (PVDF) Matrix", *MRS Advances*, 4, 2103-2108, 2019.

62. A. Foster, A. Meddeb, M. Wonders, M. Flaska, M. Sharma, **Z. Ounaies**, and I. Jovanovic, "On the fabrication and characterization of heterogeneous composite neutron detectors with triple-pulse-shape-discrimination capability", *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 954, 161681, 2019.
61. W. Zhang, S. Ahmed, J. Hong, S. Masters, **Z. Ounaies** and M. Frecker, "Finite Element Analysis of Electroactive and Magnetoactive Coupled Behaviors in Multi-Field Origami Structures", *Journal of Intelligent Materials Systems and Structures*, accepted, 2018.
60. A. Foster, A. Meddeb, K. Wilhelm, **Z. Ounaies**, and I. Jovanovic, "Characterization of Lithium-Glass and Polyvinyl Toluene Composites with Varying Geometries for Fast Neutron Detection", *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 905, 29-32, 2018.
59. M. Vecchio , A. Meddeb, M. Lanagan, **Z. Ounaies**, and J. Shallenberger, "Plasma Surface Modification of P(VDF-TrFE): Influence of Surface Chemistry and Structure on Electronic Charge Injection", *J. App. Phys*., 124(11), 114102, 2018.
58. Chae, C. K. Jeong, Z. Ounaies, and S. H. Kim, "Review on Electromechanical Coupling Properties of Biomaterials", *ACS Applied Bio Materials*, 1(4), 936-953, 2018.
57. Nattress, K. Ogren, A. Foster, A. Meddeb, **Z. Ounaies**, and I. Jovanovic, "Discriminating Uranium Isotopes Using the Time-Emission Profiles of Long-Lived Delayed Neutrons", *Physical Review Applied*, 10(2), 024049, 2018.
56. R. Song, H. Ben Atitallah, A. Muliana, and **Z Ounaies**, "Hysteretic Electro-Mechanical Coupling Response of PZT Fibers: Constitutive Modeling and Experiments", *Ferroelectrics*, 526 (1), 95-119, 2018.
55. W. Zhang, S. Ahmed, S. Masters, **Z. Ounaies** and M. Frecker, "Finite Element Analysis of Electroactive Polymer and Magnetoactive Elastomer Based Actuation for Origami Folding", *Smart Materials and Structures*, 26(10), 2017.
54. S. Ahmed, **Z. Ounaies**, and M. T. Lanagan, "On the Impact of Self-Clearing on Electroactive Polymer (EAP) Actuators", *Smart Materials and Structures*, 26(10), 2017.
53. I. Chae, S. Ahmed, H. Ben Atitallah, J. Luo, Q. Wang, **Z. Ounaies**, and S. H. Kim, "Vibrational Sum Frequency Generation (SFG) Analysis of Ferroelectric Response of PVDF-Based Copolymer and Terpolymer", *Macromolecules*, 50 (7), pp 2838–2844, 2017.
52. S. Ahmed, **Z. Ounaies**, and E. Arrojado, "Electric Field Induced Bending and Folding of Polymer Sheets", *Sensors and Actuators A: Physical*, 260, pp.68-80, 2017.
51. P. Celli, S. Gonella, V. Tajeddini, A. Muliana, S. Ahmed and **Z. Ounaies**, "Wave Control Through Soft Microstructural Curling: Bandgap Shifting, Reconfigurable Anisotropy and Switchable Chirality", *Smart Materials and Structures*, 26 (3), 2017.
50. L. Bowen, K. Springsteen, S. Ahmed, E. Arrojado, M. Frecker, T. W. Simpson, **Z. Ounaies**, and P. von Lockette, "Design, Fabrication, and Modeling of an Electric-Magnetic Self-Folding Sheet", *Journal of Mechanisms and Robotics*, 9(2), 021012-021025, 2017.
49. I. Jovanovic, A. Foster, V. Kukharev, M. Mayer, A. Meddeb, A., J. Nattress, **Z. Ounaies**, and C.Trivelpiece, "Spectroscopic Neutron Detection Using Composite Scintillators", *International Journal of Modern Physics: Conference Series*, Volume 44, p. 1660232, 2016.
48. J. Natress, M. Mayer, A Foster, A., Meddeb, C. Trivelpiece, **Z. Ounaies**, and I. Jovanovic "Capture-gated Spectroscopic Measurements of Monoenergetic Neutrons with a Composite Scintillation Detector", *IEEE Transactions on Nuclear Science*, Volume 63(2), p.1227-1235, 2016.
47. A. B. Meddeb, **Z. Ounaies**, and M. T. Lanagan, "Enhancement of Electrical Properties of Polyimide Films By Plasma Treatment", *Chemical Physics Letters,* 649, 111, 2016.
46. H. Ben Atitallah, **Z. Ounaies**, and A. Muliana, "Temperature and Time Dependence of the Electro-Mechanical Properties of Flexible Active Fiber Composites", *Smart Mater. Struct.* 25(4), 045002, 2016.

45. A. Jemai, F. Najar, M. Chafra, and **Z. Ounaies**, "Modeling and Parametric Analysis of a Unimorph Piezocomposite Energy Harvester with Interdigitated Electrodes", *Composite Structures*, Volume 135, p.176-190, 2016.
44. K. A. Khan, A. H. Muliana, H. B. Atitallah, and **Z. Ounaies**, “Time-Dependent and Energy Dissipation Effects On The Electro-Mechanical Response of PZTs”, *Mechanics of Materials*, Volume 102, p.74-89, 2016.
43. N. Sigamani, **Z. Ounaies**, G. Ehlert, and H. Sodano,"Electromechanical Response of Reduced Graphene Oxide–Polyvinylidene Fluoride Nanocomposites Prepared Through In-Situ Thermal Reduction”, *Journal of Applied Physics*, Volume 117, p.154102, 2015.
42. M. Mayer, J. Nattress, V. Kukharev, A. Foster, A. Meddeb, C. Trivelpiece, **Z. Ounaies**, and I. Jovanovic, "Development and Characterization of a Neutron Detector Based on a Lithium Glass/Polymer Composite", *Nuclear Instruments and Methods in Physics Research,* Volume 785, p.117-122, 2015.
41. H. Ben Atitallah, **Z. Ounaies**, and A. Muliana, "A Parametric Study on Flexible Electro-Active Composites: Importance of Geometry and Matrix properties ", *Journal of Intelligent Materials Systems and Structures*, Volume 26, no. 17, p. 2386-2394, 2014.
40. P. Khodaparast and **Z. Ounaies**, "Influence of Dispersion States on the Performance of Polymer-Based Nanocomposites", *Smart Mater. Struct.*, Volume 23, p. 10400, 2014.
39. S. Ahmed, **Z. Ounaies**, and M. Frecker, "Origami-Inspired Folding and Unfolding of Structures: Fundamental Investigations of Dielectric Elastomer-Based Active Materials", *Smart Mater. Struct.*, Volume 23, p. 094003, 2014.
38. K. McGough, S. Ahmed, M. Frecker, and **Z. Ounaies**,"Origami-Inspired Folding and Unfolding of Structures: Fundamental Investigations of Dielectric Elastomer-Based Active Materials", *Smart Mater. Struct.*, Volume 23, p. 094002, 2014.
37. A. Kadimi, K. Benhamou, **Z. Ounaies**, A. Magnin, A. Dufresne, H. Kaddami, and M. Raihane, "Electric Field Alignment of Nanofibrillated Cellulose (NFC) in Silicone Oil: Impact on Electrical Properties", *American Chemical Society (ACS) Applied Materials and Interfaces*, Volume 6 (12), pp. 9418 – 9425, 2014.
36. O. Lopez-Pamies, T. Goudarzi, A. Meddeb and **Z. Ounaies**, "Extreme Enhancement and Reduction of the Dielectric Response of Polymer Nanoparticulate Composites via Interphasial Charges", *Applied Physics Letters*, Volume 104, p. 242904, 2014.
35. A. Jemai, F. Najar, M. Chafra, and **Z. Ounaies**, "Mathematical Modeling of an Active-Fiber Composite Energy Harvester with Interdigitated Electrodes", *Shock and Vibration*, Volume 2014, Article ID 971597, 9 pages, 2014.
34. M. Rekik, S. El-Borgi, and **Z. Ounaies**, "An Axisymmetric Problem of an Embedded Mixed-Mode Crack in a Functionally Graded Magnetoelectroelastic Infinite Medium", *Applied Mathematical Modelling*, Volume 38, Issue 4, pp. 1193 – 1210, 2014.
33. V. Tajeddini, H. Ben Atitallah, A. Muliana, and Z. Ounaies, "Nonlinear Viscoelastic Behavior of Active Fiber Composites", *Journal of Engineering Materials and Technology*, Volume 136, No. 2, 2014.
32. S. Kalidindi, **Z. Ounaies**, and J. Dowden, "Single Walled Carbon Nanotube Reinforced High Density Polyethylene Composites By Solution Casting", *Journal of Nanostructured Polymers and Nanocomposites*, Volume 9, No. 3, 2013.
31. P. Khodaparast and **Z. Ounaies**, "On the Impact of Functionalization and Thermal Treatment on Dielectric Behavior of Low Content TiO2/PVDF Nanocomposites," *Institute of Electrical and Electronics Engineers (IEEE) Transactions on Dielectrics and Electrical Insulation*, Volume 20, No. 1, 2013.
30. M. Rekik, S. El-Borgi, and **Z. Ounaies**, "The Axisymmetric Problem of a Partially Insulated Mixed-Mode Crack Embedded in a Functionally Graded Pyro Magneto-Electro-Elastic Infinite Medium Subjected to Thermal Loading," *Journal of Thermal Stresses*, Volume 35, Issue 11, pp. 947-975, 2012.

29. E. Helal, **Z. Ounaies**, and A. Meddeb*, "Processing and Characterization of Two and Three-phase Polymer-based Nanocomposites for Energy Storage Applications," International Journal of Microstructure and Materials Properties, Volume 7, No. 5, 2012.
28. R. Ribeiro, S. Banda, **Z. Ounaies**, H. Ucisik, M. Usta, and H. Liang, "A Tribological and Biomimetic Study of PI-CNT Composites for Cartilage Replacement," *Journal of Materials Science*, Volume 47, Issue 2, pp. 649-658, 2012.
27. M. Rekik, S. El-Borgi, and **Z. Ounaies**, "An Embedded Mixed-Mode Crack in a Functionally Graded Magnetoelectroelastic Infinite Medium", *International Journal of Solids and Structures*, Volume 49, pp. 835 – 845, 2012.
26. A. Pankonien, **Z. Ounaies**, and C. Yang, "Electrospinning of Cellulose and SWNT-cellulose Nano Fibers for Smart Applications", *Journal of Mechanical Science and Technology*, Volume 25, Issue 10, 9 pages, 2011.
25. L.-H. Sun, **Z. Ounaies**, X.-L. Gao, C. A. Whalen, and Z.-G. Yang, "Preparation, Characterization and Modeling of Carbon Nanofiber/Epoxy Nanocomposites", *Journal of Nanomaterials*, Volume 2011, Article ID 307589, 8 pages, 2011.
24. S. Kalidindi, **Z. Ounaies** and H. Kaddami, "Toward the Preparation of Nanocomposites with Oriented Fillers: Electric Field-Manipulation of Cellulose Whisker in Silicone Oil", *Smart Materials and Structures*, Volume 19, Issue 9, pages 1 – 6, 2010.
23. K. Maxwell, J. Whitcomb, **Z. Ounaies**, and A. Barhoumi, "Finite Element Analysis of a Three-Phase Piezoelectric Nanocomposite", *Journal of Intelligent Material Systems and Structures*, Volume 21, No. 11, pp. 1073 – 1084, 2010.
22. J. D. Jacobs, M. J. Arlen, D. H. Wang, **Z. Ounaies**, R. Berry, L.-S. Tan, P. H. Garrett, and R. A. Vaia, "Dielectric Characteristics of Polyimide CP2", *Polymer*, Volume 51, Issue 14, pp. 3139 – I3146, 2010.
21. S. Deshmukh and **Z. Ounaies**, "Single Wall Carbon Nanotube (SWNT)-Polyimide Nanocomposites as Electrostrictive Materials", *Sensors and Actuators A: Physical*, Volume 155, Issue 2, pp. 246 – 252, 2009.
20. **Z. Ounaies**, C. Park, P. Lillehei, and J. Harrison, "Evidence of Piezoelectricity in SWNT-Polyimide and SWNT-PZT-Polyimide Composites", *Journal of Thermoplastic Composite Materials*, Volume 21, No. 5, pp. 393 – 409, 2008.
19. R. Perez, S. Banda, and **Z. Ounaies**, "Determination of the Orientation Distribution Function (ODF) in Aligned SWNT Polymer Nanocomposites by Polarized Raman Spectroscopy", *Journal of Applied Physics*, Volume 103, Issue 7, pp. 074302.1 – 074302.9, 2008.
18. A. Al-Masri, **Z. Ounaies**, Y.-S. Kim, and J. Grunlan, "Characterization of Solution-Processed Double Walled Carbon Nanotubes (DWNT) -Polyvinylidene Fluoride (PVDF) Nanocomposites", *Macromolecular Materials and Engineering*, Volume 293, Issue 2, pp. 123 – 131, 2008.
17. P. Bahukudumbi, E. W. Neil, A. Beskok, M. A. Bevan, G. H. Huff, D. Lagoudas, and **Z. Ounaies**, "Colloidal Microstructures, Transport, and Impedance Properties within Interfacial Microelectrodes", *Applied Physics Letters*, Volume 90, Issue 22, pp. 224102 – 224102-3, 2007.
16. S. Mani, R. Perez, H. Lee, **Z. Ounaies**, W. Hung, and H. Liang, "Effects of Applied Potential on Friction of a Piezoelectric Materials", *Journal of Tribology*, Volume 129, Issue 4, pp. 836 – 841, October 2007.
15. R. C. Smith, S. Seelecke, M. J. Dapino , and **Z. Ounaies**, "A Unified Framework for Modeling Hysteresis in Ferroic Materials", *Journal of The Mechanics and Physics of Solids*, Volume 54, No. 1, pp. 46 – 85, 2006.
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R. C. Smith, Z. Ounaies, and R. Wieman (2000), "Model for Rate-Dependent Hysteresis in Piezoceramic Materials Operating at Low Frequencies", Proceedings of SPIE: Smart Structures and Materials, Volume 3992, pp. 128 – 136, Newport Beach, CA, March 06, 2000.

J. Su, Z. Ounaies, J. S. Harrison, Y. Bar-Cohen, and S. P. Leary (2000), "Electromechanically Active Polymer Blends for Actuation", Proceedings of SPIE: Smart structures and Materials, Volume 3987, pp. 65 – 72, Newport Beach, CA, March 06, 2000.

R. C. Smith, and Z. Ounaies. (2000). "A Model for Asymmetric Hysteresis in Piezoceramic Materials", Materials Research Society Symposium Proceedings, Vol. 604; pp285-290.

T. Jordan, Z. Ounaies, J. Tripp, and P. Tcheng. (2000). "Electrical Properties and Power Considerations of a Piezoelectric Actuator", Materials Research Society Symposium Proceedings, Vol. 604; pp203-208.

C. Park, Z. Ounaies, J. Su, J. G. Smith, and J. S. Harrison. (2000). "Polarization Stability of Amorphous Piezoelectric Polyimides", Materials Research Society Symposium Proceedings, Vol. 600; pp153-158.

J. Su, Z. Ounaies, and J. S. Harrison. (2000). Ferroelectric and Piezoelectric Properties of Blends of Poly(vinylidene fluoride-trifluoroethylene) and a Graft Elastomer", Materials Research Society Symposium Proceedings, Vol. 600; pp95-100.

R. C. Smith, and Z. Ounaies. (1999). "A Hysteresis Model for Piezoceramic Materials", Proceedings of the ASME International Mechanical Engineering Congress and Exposition, Vol.87, pp27-32.

Jordan, T. L.; Z. Ounaies, Turner, T. L. (1999). "Complex Piezoelectric Coefficients of PZT Ceramics: Method for Direct Measurement of d~3~3", Materials Research Society Symposium Proceedings, Vol. 479; pp231-236, 1997.

Z. Ounaies, C. Park, J. S. Harrison, and J. G. Smith (1999), "Structure-Property Study of Piezoelectricity in Polyimides", Proceedings of SPIE: Smart Structures and Materials, Issue 3669, pp. 171 – 178, Newport Beach, CA, March 01, 1999.

J. O. Simpson, Z. Ounaies, and C. Fay. (1997)."Polarization and Piezoelectric Properties of a Nitrile Substituted Polyimide", Materials Research Society Symposium Proceedings, Vol. 479; pp59-64,

Z. Ounaies, J. A. Young, J. O. Simpson, and B. L. Farmer. (1997). "Dielectric Properties of Piezoelectric Polyimides", Materials Research Society Symposium Proceedings; Vol. 479; pp53-58.

V. K. Varadan, V. V. Varadan, F. Selmi, Z. Ounaies, and K. A. Jose (1994(, "Multilayer Tunable Ferroelectric Materials and Thin Films", Proceedings of SPIE: Smart Structures and Materials, Issue 2189, pp. 433 – 447, Orlando, FL, February 13, 1994.

Z. Ounaies, V. K. Varadan, and V. V. Varadan (1994), "Sol-Gel and Microwave Processing of PZT Materials for Sensor and Actuator Applications", Proceedings of SPIE: Smart Structures and Materials, Issue 2189, pp. 413 – 422, Orlando, FL, February 13, 1994.

X.-Q. Bao, Z. Ounaies, V. K. Varadan, and V. V. Varadan (1994), "Active Noise Control Using a Piezoelectric Actuator for a Machine", Proceedings of SPIE: Smart Structures and Materials, Issue 2189, pp. 211 – 223, Orlando, FL, February 13, 1994.

EDITORIALS

D. Hartl, D. Lagoudas, R. Malak, M. Frecker and Z. Ounaies, "Active Materials and Structures for Origami Engineering", Smart Mater. Struct., Volume 23, p. 090201, 2014.

S. Seelecke, A. Erturk, Z. Ounaies, H. Naguib, J. Huber, T. Turner, I. Anderson, M. Philen, V. Baba Sundaresan, “Adaptive and active materials: selected papers from the ASME 2012 Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS 12)(Stone Mountain, GA, USA, 19–21 September 2012)”, Smart Mater. Struct., Volume 22, p. 094001, 2013.

INVITED BOOK CHAPTERS

Kadimi, A., Benhamou, K., Habibi, Y., Ounaies, Z., and Kaddami, H. Nanocellulose Alignment and Electrical Properties Improvement. Editor(s): Debora Puglia, Elena Fortunati, José Maria Kenny,

Multifunctional Polymeric Nanocomposites Based on Cellulosic Reinforcements. William Andrew Publishing, 2016.

Jemai, A., Najar, F., Chafra, M. and Ounaies, Z. Advanced Parametric Analysis of Piezoelectric Actuators with Interdigitated Electrodes Having Various Cross-Sections. Design and Modeling of Mechanical Systems-II. Springer International Publishing. 2015.

Atkinson, G.M., and Ounaies, Z. Polymer Microsystems: Materials and Fabrications. In M. Gad-el-Hak (Ed.), The MEMS Handbook, second edition, volume II, CRC Press, Boca Raton, Florida. 2005.

Ounaies, Z. Piezoelectric Materials. In Wnek, G. and Bowlin, G. (Eds.), Encyclopedia of Biomaterials and Biomedical Engineering. Marcel Dekker, Inc. 2004.

Harrison, J. S. and Ounaies, Z. Piezoelectric Polymers. In Biderman, A. (Ed.), Encyclopedia of Smart Materials. John Wiley and Sons. 2002.

Jordan, T. L. and Ounaies, Z. Characterization of Piezoelectric Ceramics. In Biderman, A. (Ed.) Encyclopedia of Smart Materials. John Wiley and Sons. 2002.

INVITED TALKS, SEMINARS AND LECTURES

I. INVITED TALKS AT INTERNATIONAL AND NATIONAL CONFERENCES

“Living Engineered Materials Systems”. The Gordon Research Conference on Multifunctional Materials and Structures, Ventura, CA, January 28-February 2, 2024. *Invited.*

“Field-Assisted Processing of Polymer-based Responsive Materials: A Path Towards Living Multifunctional Materials”. The 1st International Conference and Scientific Exhibition on Living Materials Systems, Freiburg, Germany, March 21-24, 2023. *Plenary.*

“Emerging Research Opportunities in Living Multifunctional Materials”. SPIE Smart Structures + Nondestructive Evaluation 2023, Long Beach (CA), USA, March 12-16, 2023. *Plenary.*

“Opportunities in Field-Assisted Processing of Polymer-Based Responsive Materials “.The 36th International Conference of The Polymer Processing Society (PPS 36), Montreal (QC), Canada, September 26-29, 2021. *Plenary.*

“Opportunities in polymer-based responsive materials”. The 31st International Conference on Adaptive Structures and Technologies (ICAST 2021), October 5-8, 2021. *Invited.*

“Multi-field processing of anisotropic nanoparticles for multifunctional applications”.
The 4th International Conference on Active Materials and Soft Mechatronics (AMSM 2019), Incheon, Republic of Korea, October 16-19, 2019. *Keynote.*

"Polymer-based multifunctional materials for energy storage, conversion and harvesting," 2nd Annual Energy Harvesting Society Meeting, Philadelphia, PA, September 7, 2018. *Invited.*

"Investigating Electrical Functionality In Particle-Modified Polymers: Towards the Design of Soft Active Materials ," ASME 2013 Conference on Smart Materials, Adaptive Structures, and Intelligent Systems (SMASIS), Snowbird, Utah, September 16 – 18th, 2013. *Invited.*

"Nano-Enabled Functional Polymers for Energy Storage," 7th World Congress on Biomimetics, Artificial Muscles and Nano-Bio (BAMN2013), Jeju Island, South Korea, August 26 – 30, 2013. *Invited.*

"Fundamental Investigations of Electroactive Polymer-Based Materials for Multi-Field Responsive Origami Structures", 16th US-Japan Seminar on Dielectric and Piezoelectric Materials, Nov 3 – 6, 2013. *Invited.*

“Dynamic Mechanical and Thermal Analysis of Polyimide/Carbon Nanotube Composite Thin Films” NATEX 2006, Dallas, TX, November 2006. *Invited.*

"Active Nanotube-Based Polymer Composites: Toward a Tailored Electromechanical Response" Materials Research Society Fall Meeting, Boston, MA, December 2006. *Invited.*

"Sensors and Actuators" ICEST 2005, Seoul, S. Korea, May 19, 2005. *Invited.*

II. INVITED UNIVERSITY LECTURES

"Shaping the Future with Penn State's Materials Research Institute: The Path Towards Living Multifunctional Materials". (May 6, 2024), The Lehigh Materials Symposium, Lehigh University, Bethlehem, PA. *Keynote.*

"Convergence Center for Living Multifunctional Material Systems,". (September 7, 2021). Millennium Café, Penn State University, University Park, PA. *Invited.*

"Opportunities in field-assisted processing of responsive polymers," (April 15, 2021). Penn State Polymers Symposium-Earth and Mineral Science 125th Anniversary, Penn State University, University Park, PA. *Invited.*

"Living Materials: Center for Living Multifunctional Material Systems," (November 11, 2020). Materials Day 2020, Penn State University, University Park, PA. *Keynote.*

"Women in 3D Printing: My Path and Personal Experiences in Engineering,". (October 8, 2020 - Present). Women in 3D Printing-Penn State Chapter, University Park, PA. *Invited.*

"Fireside Chat: My Path and Personal Experiences in Engineering," (February 26, 2020). Learning Factory, University Park, PA. *Invited.*

"Reflections on Research and Teaching Collaborations." (July 23, 2019). Millennium Café, Penn State University, University Park, PA. *Invited.*

"Multi-field processing of anisotropic nanoparticles for multifunctional applications," (April 25, 2018). Department of Mechanical Engineering Seminar Series, Florida State University, Tallahassee, FL. *Invited.*

"Active polymer composites: Structure-processing-processing triad," (April 3, 2018). Korean Aerospace University (KAU), Goyang, South Korea. *Invited.*

"Responsive polymer-based materials: Processing, characterization and opportunities," (April 2, 2018). Sungkyunkwan University (SKKU), Suwon, Korea. *Invited.*

"Multi-field processing of anisotropic nanoparticles for multifunctional applications," (March 29, 2018). Inha University, Incheon, Korea. *Invited.*

"Design, processing and characterization of self-folding origami-inspired structures," (March 28, 2018). Korean Institute of Science and Technology (KIST), Korean Institute of Science and Technology (KIST), Seoul, Korea. *Invited.*

"Active Polymer Composites" LEM3 Seminar Series, Ecole Nationale Superieur d'Arts et Metiers, May 29th, 2013. *Invited.*

"Investigating Electrical Functionality in Particle-Modified Polymers" Civil Engineering Seminar Series, Carnegie Mellon University, May 3rd, 2013. *Invited.*

"Nano-Enabled Functional Polymers for Actuation and Energy Storage" Mechanical Engineering Seminar Series, The Pennsylvania State University, October 23rd, 2012. *Invited.*

"Nano-Enabled Functional Polymers for Actuation and Energy Storage" Mechanical and Industrial Engineering Seminar Series, The University of Toronto, October 19th, 2012. *Invited.*

"Research at the EMCL: Nano-Enabled Functional Polymers for Electrical Applications" PSU Materials Research Institute Millenium Cafe, The Pennsylvania State University, May 29th, 2012. *Invited.*

"Design of Electrical Functionality in Polymer-Based Nanocomposites" Polymer Physics Seminar Series, The Pennsylvania State University, May 31st, 2011. *Invited.*

"Soft Materials for Energy Conversion and Energy Storage" Engineering Science and Mechanics Seminar Series, The Pennsylvania State University, February 8th, 2012. *Invited.*

"Research in the Electroactive Materials Characterization Laboratory" PSU Center for Acoustics and Vibrations, The Pennsylvania State University, April 11th, 2011. *Invited.*

"Active Polymer Nanocomposites: Towards Enhanced Sensing and Actuation Performance" Mechanical Engineering Seminar Series, The Pennsylvania State University, January 27th, 2009. *Invited.*

"Active Polymer Nanocomposites: Towards Enhanced Sensing and Actuation Performance" Mechanical Engineering Seminar Series and the Nanotechnology Graduate Program Seminar Series, Stevens Institute of Technology, April 9th, 2008. *Invited.*

"Active Nanocomposites: Towards Engineered Microstructures for Enhanced Sensing and Actuation" Aerospace Engineering Seminar Series, University of Illinois Urbana-Champaign, December 3rd, 2007. *Invited.*

"Active Polymer Nanocomposites: Can Nanotechnology Really Help Smart Materials?" Mechanical Engineering Seminar Series, University of Nevada-Reno, March 16th, 2007. *Invited.*

"Active Polymer Nanocomposites: Toward Future Multifunctional Materials" Distinguished Seminar Speaker Series, FAMU-FSU College of Engineering and High-Performance Materials Institute, November 3rd, 2006. *Invited.*

"Active Nanocomposites: Towards Engineered Microstructures for Enhanced Sensing & Actuation" Biomedical Graduate Seminar, Biomedical Engineering, Texas A&M University, College Station, TX, February 20th, 2006. *Invited.*

"Active Polymer Nanocomposites: Toward Future Multifunctional Materials" Mechanical and Materials Science and Engineering Seminar Series , Rice University, November 15th, 2006. *Invited.*

"Multifunctional Performance of Carbon Nanotube-Polymer Composites" Mechanical Engineering Seminar Series, University of Delaware, Newark, DE, September 9th, 2005. *Invited.*

"Multifunctional Performance of Carbon Nanotube-Polymer Composites" Mechanical Engineering Seminar Series, Inha University, Incheon, S. Korea, May 16, 2005. *Invited.*

"Single Wall Carbon Nanotube-Polymer Composites: Enhanced Sensor and Actuator Response" Charles Lindbergh Seminar Series in Mechanical Engineering, University of Wisconsin-Madison, Madison, WI, March 30, 2005. *Invited.*

"Organic-Inorganic Nanocomposites: Enhanced Sensor and Actuator Response", Seminar Series, The Carnegie Mellon University, Pittsburgh, PA, October 23rd, 2003. *Invited.*

"Development of Flexible Piezoelectric Nanocomposites for Biomedical Applications", School of Biomedical Engineering and Sciences Seminar Series, Virginia Polytechnic Institute and State University, Blacksburg, VA, January 17th, 2003. *Invited.*

“Electroactive Polymers Development for Aerospace Applications”, Engineering Science and Mechanics Graduate Seminar Series, The Pennsylvania State University, State College, PA, February 13th, 2002. *Invited.*

III. Invited Laboratory, Institute, Industry and Workshop Lectures

"From Smart Materials to Living Materials" (May 2022). Z., NATEG International, Virtual. *Invited.*

“Recent advances and opportunities in polymer-based responsive materials”. (June 2021). NSF Center for Dielectrics and Piezoelectrics Spring Meeting, University Park, PA. *Invited.*

"Smart Materials: History, Demonstrations, and Structure-Property Relationships," (May 4, 2020). International. NATEG International, Virtual. *Invited.*

"EC materials: scale up and manufacturing challenges," (October 25, 2018). Panel at the Materials Research Institute Materials Day, The Pennsylvania State University, University Park, PA. *Invited.*

"EC materials scale up, manufacturing and capabilities," (October 22, 2018). Engineering Research Center Workshop on ElectroCaloric Materials, The Pennsylvania State University, University Park, PA. *Invited.*

"Polymer-based active materials," (September 25, 2018). 3M Corporate Research System Center, 3M. *Invited.*

“A Vision for Functional Inorganic/Organic Materials ” NSF Center for Dielectrics and Piezoelectrics Meeting, Raleigh, North Carolina, November 6-7, 2013. *Invited.*

“Nano-Enabled Functional Polymers for Electrical Applications” Actuator Workshop, University of Washington, Seattle, Washington, April 19-21, 2012. *Invited.*

“Polymer-Matrix Structured Composites with Dispersed High-k Fillers” NSF Center for Dielectrics and Piezoelectrics Planning Meeting, Raleigh, North Carolina, November 1-2, 2012. *Invited.*

“Research in the Electroactive Materials Characterization Laboratory” CAV Technology Transfer Spring Workshop, PSU Center for Acoustics and Vibrations, University Park, PA, May 9th, 2011. *Invited.*

“Design of Electrical Functionality in Polymer-Based Systems” NSF Center for Dielectrics Studies Meeting, State College, PA, May 12th, 2011. *Invited.*

“Active Polymer Nanocomposites: Towards Enhanced Sensing and Actuation Performance” US-North Africa Workshop on Nanomaterials and Nanotechnology, Tunis, March 18-21th, 2008. *Invited.*

“Development of ‘Smart’ Structural Nanocomposites” Schlumberger Research and Development, Houston, TX, June 2007. *Invited.*

“Materials Possibilities in Polymer Nanocomposites: Electrostriction” US-Europe Workshop on Adaptive Aerospace Structures and Materials, Saint Maximin, France, November 4-7th, 2007. *Invited.*

“Multifunctional Performance of Carbon Nanotube-Polymer Composites” Air Force Research Laboratory-WP, Dayton, OH, March 28th, 2005. *Invited.*

“Multifunctional Performance of Carbon Nanotube-Polymer Composites” DOW Chemical, Houston, TX, March 3rd, 2005. *Invited.*

“Polymer Nanocomposites as Electrostrictive Benders”, Workshop on Testing and Characterization Methods for Polymer Transducers, US Army Research Office, Aberdeen, MD, November 3-4th, 2004. *Invited.*

“Piezoelectric Polymer Unimorphs”, Workshop on Industrial Mathematics Modeling, North Carolina State University, Raleigh, NC, 2001. *Invited.*

ISSUED PATENTS

13. "Dielectric Devices and Methods of Fabrication.", Sponsor/Agency Award number: US-11525087-B2; inventors: Kutchko, C., Ounaies, Z., Ben Atitallah, H., Wyckoff, N., Kumar, A., Stalder, R., Walters, D.; December 13, 2022.

12. "Dielectric Devices and Methods of Fabrication.", Sponsor/Agency Award number: US-20200263092-A1; inventors: Kutchko, C., Ounaies, Z., Ben Atitallah, H., Wyckoff, N., Kumar, A., Stalder, R., Walters, D.; August 20, 2020.

11. "Dielectric Devices and Methods of Fabrication.", Sponsor/Agency Award number: US 10,619,099 B2; inventors: Kutchko, C., Ounaies, Z., Ben Atitallah, H., Wyckoff, N., Kumar, A., Stalder, R., Walters, D.; April 14, 2020.

10. "Dielectric Devices and Methods of Fabrication.", Sponsor/Agency Award number: US-20190062635-A1; inventors: Kutchko, C., Ounaies, Z., Ben Atitallah, H., Wyckoff, N., Kumar, A., Stalder, R., Walters, D.; February 28, 2019.

9. “Electrically conductive, optically transparent polymer/carbon nanotube composites”, U. S. patent number 7,972,536; inventors: Connell, J.; Smith, J.; Harrison, J. S.; Park, C.; Watson, K. A.; and Ounaies, Z.; July 5, 2011.

8. “Electrically conductive, optically transparent polymer/carbon nanotube composites and process for preparation thereof”, U. S. patent number 7,906,043; inventors: Connell, J.; Smith, J.; Harrison, J. S.; Park, C.; Watson, K. A.; and Ounaies, Z.; September 15, 2009.

7. “Electrically conductive, optically transparent polymer/carbon nanotube composites and process for preparation thereof”, U. S. patent number 7,588,699; inventors: Park, C.; Watson, K.; Ounaies, Z.; Connell, J.; Smith, J. and Harrison, J.; September 15, 2009.

6. “Method of making an electroactive sensing/actuating material for carbon nanotube polymer composite”, U.S. patent number 7,527,751; inventors: Ounaies, Z.; Park, C.; Harrison, J.; Holloway, N.; and Draughon, G.; May 5, 2009.

5. “Multilayer electroactive polymer composite material”, U.S. patent number 7,507, 472; inventors: Ounaies, Z.; Park, C.; Harrison, J.; Holloway, N.; and Draughon, G.; March 24, 2009.

4.”Self-sensing stents, smart materials-based stents, drug delivery systems, other medical devices, and medical uses for piezo-electric materials”, U.S. patent number US-20090036975-A1; inventors: Ward, K.; Ounaies, Z.; and Vetrovec, G.; February 5, 2009.

3. “Sensing/actuating materials made from carbon nanotube polymer composites and methods for making same”, U.S. patent number 7, 402, 264; inventors: Ounaies, Z.; Park, C.; Harrison, J.; Holloway, N.; and Draughon, G.; July 22, 2008.

2. “Electrospun electroactive polymers”, U.S. patent number 20060057377 A1; inventors: Harrison, J.; Burney, K.; Ounaies, Z.; Park, C.; and Siochi, E.; March 16, 2006.

1. “Polymeric blends for sensor and actuation dual functionality”, U.S. patent number 6,689,288; inventors: St. Clair, T.; Harrison, J.; Su, J.; and Ounaies, Z.; February 10, 2004.

FUNDED RESEARCH PROJECTS

Title: Skilled Training in Administration and Institutional Research (STAIR)
Sponsor: National Science Foundation; Award period: 12/15/2024-11/30/2029
Total Grant Level: $5M
Role: co-PI

Title: LEAP HI: GOALI: Accelerating Design for Additive Manufacturing of Smart Multimaterial Devices
Sponsor: National Science Foundation via Geargia Tech; Award period: 9/1/2022-8/31/2027
Total Grant Level: $2M
Role: co-PI (Penn State PI)

Title: IRES Track I: International Partnership for Responsive Infrastructure using Sustainable Multifunctional Materials (iPRISM)
Sponsor: National Science Foundation; Award period: 9/1/2022-8/31/2025
Total Grant Level: $299,999
Role: PI

Title: IRES Track I: International Partnership for Responsive Infrastructure using Sustainable Multifunctional Materials (iPRISM)
Sponsor: National Science Foundation; Award period: 9/1/2022-8/31/2025
Total Grant Level: $299,999
Role: PI

Title: DMREF: Collaborative Research: Elastomers Filled with Electro- and Magneto-Active Fluid Inclusions: A New Paradigm for Soft Active Materials
Sponsor: National Science Foundation; Award period: 9/1/2019-8/31/2025(nce)
Total Grant Level: $1,713,112
Role: PI

Title: Supp: LEAP HI: GOALI: Accelerating Design for Additive Manufacturing of Smart Multimaterial Devices: Research Experience for Undergraduates
Sponsor: National Science Foundation via University of Texas; Award period: 5/1/2023-4/30/2025
Total Grant Level: $18,000
Role: co-PI (Penn state PI)

Title: Conference: Track 1: The 2022 Big Ten Womens Workshop
Sponsor: National Science Foundation; Award period: 9/1/2020-2/28/2022
Total Grant Level: $50,000
Role: co-PI

Title: SG: LEAPHI: GOALI: DfAM of Smart Materials
Sponsor: National Science Foundation; Award period: 9/1/2020-2/28/2022
Total Grant Level: $500,000
Role: co-PI

Title: Multi-Material Properties *via* Multi-Field Processing on a Single Constituent Set
Sponsor: National Science Foundation
Period of Performance: 9/1/2018 - 8/31/2023(nce)

Total Budget: $496,743
Role: co-PI

Title: The 2019 Big 10 Women's Workshop (BTWW): Closing the Mentoring Loop
Sponsor: National Science Foundation
Period of Performance: 11/1/2018 - 10/31/2019
Total Budget: $50,000
Role: co-PI

Title: iSuperSeed2: Biologically-Produced Nanomaterials (BPN)
Sponsor: National Science Foundation
Period of Performance: 8/1/2018 - 7/31/2020
Total Budget: $500,000
Role: co-PI

Title: High Dielectric Breakdown Multilayer Polymer Laminates: Exploiting the Interface as Barrier to Charge Transport
Source: NSF I/UCRC Center for Dielectrics and Piezoelectrics; Award period: 7/1/2017 - 6/30/2019
Total Grant Level: $80,000
Role: co-PI

Title: Collaborative Research: Extreme Enhancement of the Electromechanical Properties of Soft Nanoparticulate Composites via Interphases
Sponsor: National Science Foundation; Award period: 5/1/2017 - 4/30/2020
Total Budget: $476,951
Role: PI with O. Lopez-Pamies (UIUC)

Title and Subject Matter: Design of New Piezoelectric Composites Using Nanocellulose
Source: Air Force Office of Scientific Research; Award period: 10/1/2015 - 9/30/2018
Total Budget: $694,412
Role: co-PI

Title and Subject Matter: Multimodal Imaging of Shielded Special Nuclear Material
Source: Department of Homeland Security/Georgia Institute of Technology; Award period: 09/1/2015 - 08/31/2020
Total Budget: $875,000
Role: co-PI

Title and Subject Matter: Design, Processing and Fabrication of a Pressure Sensor Using a Piezoelectric Polymer
Source: PPG Industries; Award period: 05/1/2015 - 12/31/2015
Total Budget: $150,000
Role: PI

Title and Subject Matter: Collaborative Proposal: Time-Dependent Hysteretic Responses and Cyclic Loading Behavior of Flexible Electro-Active Composites.
Source: National Science Foundation (NSF); Award period: 09/01/2014-08/31/2017
Total Budget: $254,433.00
Role: PI

Title and Subject Matter: Collaborative Research: Multi-university I/UCRC for Dielectrics and Piezoelectrics
Source: National Science Foundation; Award period: 3/1/2014-2/28/2019
Total Budget: $251,857
Role: Faculty

Title and Subject Matter: Novel Multilayer Polymer Laminates for High Energy Density and Low Loss Dielectrics.
Source: National Center for Dielectrics and Piezoelectrics (NSF I/UCRC); Award period: 07/01/2014-06/30/2016
Total Budget: $100,000.00
Role: PI

Title and Subject Matter: National Science Foundation (NSF) Emerging Frontiers in Research and Innovation (EFRI) – Origami Design for Integration of Self-assembling Systems for Engineering Innovation (ODISSEI) – Research Experience and Mentoring (REM): Multi-Field Responsive Origami Structures- Advancing the Emerging Frontier of Active Compliant Mechanisms
Source: National Science Foundation; Award period: 05/01/2014-04/30/2015
Total Budget: $100,000.00
Role: co-PI

Title and Subject Matter: Collaborative Research: ARI-LA: Low Dose Inspection for Nuclear Threats Using Monochromatic Gamma-Rays.
Source: National Science Foundation (NSF) and Department of Homeland Security; Award period: 01/01/2014-12/31/2019 (nce)
Total Budget: $1,699,103.00
Role: co-PI

Title and Subject Matter: Atomic Layer Deposition on Dielectric Polymers for High Temperature Energy Storage.
Source: Saudi Basic Industries Corporation (SABIC) Plastics; Award period: 10/01/2013-10/30/2014
Total Budget: $120,000.00
Role: co-PI

Title and Subject Matter: EAGER: Collaborative Research: Processing and Characterization of Soft Active Nanoparticulate Composites.
Source: National Science Foundation (NSF); Award period: 08/01/2013-01/30/2015
Total Budget: $90,000
Role: PI with Oscar Lopez-Pamies (UIUC)

Title and Subject Matter: Multifunctional Material Systems for Reconfigurable Antennas in Superconfigurable Structures.
Source: Air Force Office of Sponsored Research; Award period: 10/01/2012-09/30/2015
Total Budget: $680,000.00
Role: co-PI

Title and Subject Matter: BOOST: U.S.-Tunisia-Morocco Partnership for Technology Innovation and Entrepreneurship Stimulation (TIES).
Source: US Department of State; Award period: 9/01/2012-12/31/2015

Total Budget: $198,000.00
Role: PI

Title and Subject Matter: National Science Foundation (NSF) Emerging Frontiers in Research and Innovation (EFRI) – Origami Design for Integration of Self-assembling Systems for Engineering Innovation (ODISSEI): Multifunctional Origami Structures - Advancing the Emerging Frontier of Active Compliant Mechanisms.
Source: National Science Foundation (NSF); Award period: 08/01/2012-07/31/2016
Total Budget: $2,000,000.00
Role: co-PI

Title and Subject Matter: US-Tunisia-Morocco Partnership for the Promotion of Technology Innovation and Commercialization Strategies in Engineering Research and Education.
Source: US Department of State; Award period: 9/01/2011-12/31/2014
Total Budget: $148,500.00
Role: PI

Title and Subject Matter: International Institute for Multifunctional Materials for Energy Conversion (IIMEC) National Science Foundation.
Source: National Science Foundation (NSF); Award period: 09/01/2009-08/31/2015
Total Budget: $4,000,000.00
Role: co-PI

Title and Subject Matter: Nano-Enhanced Soft Materials for Electrical Insulation and Energy Storage.
Source: Saudi Basic Industries Corporation (SABIC); Award period: 09/01/2012-08/31/2013
Total Budget: $118,000.00
Role: PI

Title and Subject Matter: Electromagnetically Tunable Fluids.
Source: US AFOSR Program; Award period: 07/01/2008-06/30/2011
Total Budget: $300,000.00
Role: co-PI

Title and Subject Matter: NIRT: Active Electromechanical Nanostructures Without the Use of Piezoelectric Constituents.
Source: National Science Foundation; Award period: 08/01/2007-07/31/2011
Total Budget: $1,218,490.00
Role: co-PI

Title and Subject Matter: CAREER: Development of 'Smart' Structural Nanocomposites Based on Interfacial Coupling and Local Field Enhancement.
Source: National Science Foundation; Award period: 03/15/2007-03/14/2012
Total Budget: $400,000.00
Role: PI

Title and Subject Matter: DURIP: Acquisition of a Combined Mechano-Electro-Chemical Characterization Equipment for Advanced Nanocomposites Research and Education
Source: US AFOSR Program; Award period: 04/01/2007-12/31/2008
Total Budget: $180,000.00
Role: PI

Title and Subject Matter: Active Nanocomposites: Energy Harvesting and Stress Generation Media for Future Multifunctional Aerospace Structures.
Source: US AFOSR; Award period: 06/01/2006-05/31/2009
Total Budget: $390,000.00
Role: PI

Title and Subject Matter: Active Nanocomposites: Development of Sensors and Actuators for Future Aerospace Applications
Source: Texas Space Grant Consortium; Award period: 09/01/2006-02/28/2009
Total Budget: $10,000.00
Role: PI

Title and Subject Matter: Active Nanocomposites for Future Aerospace Applications
Source: TiiMS-Texas Institute for Intelligent Bio-Nano Materials and Structures for Aerospace Vehicle; Award period: 1/01/2007-12/31/2007
Total Budget: $45,000.00
Role: PI

Title and Subject Matter: Multifunctional Performance of Carbon Nanotube-Polymer Composites
Source: National Science Foundation; Award period: 10/01/2004-9/30/2007
Principal Investigator and Technical Lead: Zoubeida Ounaies
Total Budget: $150,000.00
Role: PI

Title and Subject Matter: Reversible Control of Anisotropic Electrical Conductivity Using Colloidal Microfluidic Networks
Source: DARPA/US Army; Award period: 11/15/2005-12/31/2006
Total Budget: $100,000.00
Role: co-PI

Title and Subject Matter: Nanostructured Electroactive Composites
Source: NASA Langley Research Center; Award period: 9/15/2005-9/14/2006
Principal Investigator and Technical Lead: Zoubeida Ounaies
Total Budget: $90,000.00
Role: PI

Title and Subject Matter: MRI: Acquisition of Metal Deposition Equipment for Integrated Electroactive Sensors, Nanostructures and Biotechnology Research and Training
Source: National Science Foundation; Award period: 9/01/2004-8/31/2005
Total Budget: $110,000.00
Role: co-PI

Title and Subject Matter: Flexible, High Performance and High Stability Sensors/Actuators
Source: NASA Langley Research Center; Award period: 2/14/2002-2/13/2004
Total Budget: $131,722.00
Role: PI

Title and Subject Matter: Processing and Characterization of Organic/Inorganic Composites
Source: NASA Langley Research Center; Award period: 2/7/2003-2/6/2005
Total Budget: $130,112.00

Role: PI

STUDENT ADVISING

MENTORING OF GRADUATE STUDENTS | The Pennsylvania State University

Student Name	**Type of Degree**	**Date Degree Granted or Expected**	**Title of Thesis**	**Current Home**
Md Abdur Rahman Bin Abdus Salam	PhD in Mech Eng	05/2027	Multiscale Design and processing of Smart Hybrid Materials	Penn State
Mohammad Hossein Zamani	PhD in Mech Eng	12/2026	Design for Additive Manufacturing of Responsive Multimaterial Devices	Penn State
Amirhossein Farahani	PhD in MATSE	05/2027	Responsive Naturally-Occurring Soft Materials	Penn State
Christian Bergen	PhD in Mech Eng	08/2025	Performance of Magnetoactive Elastomer Soft Robots through a Computational Magnetoelastic Framework	Penn State
Yasham Mundada	M.S. in AMD	05/2024	3D Printing of Piezoelectric Ceramics	Penn State
Xiaoyue Zhang	PhD in Mech Eng	08/2023	Triboelectric Polymer Nanogenerators for Energy Harvesting	Penn State
Dashiell Papula	M.S. in MATSE	08/2022	External Field Mediated Structuring of Multifunctional Composites	Penn State
Nathan Hansen	M.S. in Mech Eng	05/2022	Finite Element Modeling of 3D Printed BioPolymer	Penn State
Jai Dhanani	M.S. in Mech Eng	05/2020	Characterization of Triboelectricity in Polymers	Penn State
Rui Leng	M.S. in Mech Eng	05/2022	Additive Manufacturing of Smart Polymer-Based Materials	Penn State
Amal Badri	M.S. in Mech Eng	05/2021	Next-Generation Neuromorphic Materials	Penn State
Wei Zhang (co-advised)	PhD in Mech Eng	12/2019	Finite Element Analysis and a Two-Stage Design Optimization of Multi-Field Origami-Inspired Structures	UT Southwestern Medical Center
Albert Foster	PhD in MATSE	05/2019	Polymer Composites for Shielded Nuclear Materials Detection	Philips
Michael Vecchio (co-advised)	PhD in MATSE	05/2019	Multilayer Polymer Films for High Energy Density and Low Loss Dielectrics	Infinera
MD Abdulla Masud	PhD in Mech Eng	05/2019	Mechanics of Magnetoactive Nanocomposites	3M
Tahzib Safwat (co-advised)	PhD in Mech Eng	05/2019	Modeling and Design of Wearable Transducers for Assistive Technologies	Johns Hopkins

Saad Ahmed	PhD in Mech Eng	11/2017	Active Materials for Responsive Origami Structures	Intel Co.
Travis Carroll	MS in Mech Eng	05/2017	Characterization of Piezoelectric Fibers	ARL at Penn State
Lydia Weitzler	MS in Mech Eng	05/2016	Magneto-Electro-Mechano Coupling in a Relaxor Ferroelectric Polymer	Hospital for Special Surgery in NY, NY
Nicholas Wyckoff	MS in Mech Eng	05/2016	Electrical and Mechanical Characterization of PZT Fibers	Ford Co. in Detroit, MI
Nirmal Sigamani	PhD in Mech Eng	05/2015	Novel Graphene Nanocomposite Actuators	LAM Research in Portland, OR
Hassene Ben Attitallah	PhD in Mech Eng	12/2014	Processing, Characterization and Modeling of Active Fiber Composites	Seagate in St. Paul, Minnesota
Payam Khodaparast	PhD in MATSE	08/2014	TiO_2/PVDF Nanocomposites: Effect of Particle Functionalization and Processing Conditions on Dielectric Properties	3M in St. Paul, Minnesota
Kevin McGough (co-advised)	MS in Mech Eng	05/2014	Finite Element Analysis and Validation of Dielectric Elastomer Actuators Used for Active Origami	Armour Technologies, Swarthmore, PA
Amira Barhoumi	PhD† in Aero Eng	08/2012	Experimental and Theoretical Design of Nanodielectrics	Apple Inc. (previously sesearch Professor at MRI)
Sanjay Kalidindi	PhD† in Aero Eng	08/2012	Electric Field alignment of Cellulose based-Polymer Nanocomposites	Applied Materials, Santa Clara, CA
Emna Helal (co-advised)	MS in Aero Eng	12/2011	In Situ Synthesis of Silver Nanoparticles-Polymer Composites as Flexible Materials with Improved Dielectric Properties	Université de Montreal

†Students moved with ZO to Penn State but their degrees were officially from Texas A&M

MENTORING OF GRADUATE STUDENTS | Texas A&M University

Student Name	**Type of Degree**	**Date Degree Granted or Expected**	**Title of Thesis**	**Current Home**
Junjia Li	MS	05/2011	Synthesis and Electric Field-Manipulaton of High Aspect Ratio	Freescale Semiconductor

Alexander Pankonien	MS	05/2011	Piezoelectric Artificial Kelp: Experimentally Validated Parameter Optimization of a Quasi-Static, Flow-Driven Energy Harvester	Air Force Research Lab (AFRL)
Casey Whalen	MS	12/2011	Dispersion and Characterization of Nickel Nanostrands in Thermoset and Thermoplastic Polymers	Pipe Wrap Inc.
Sujay Deshmukh	PhD	12/2010	Nano-Based Actuators for Space Applications	Intel Inc.
Nirmal Shanker	MS	05/2010	Thermo-mechanical Characterization of Elastomers	PhD at Penn State (see above)
Sumanth Banda	PhD	12/2008	Electric Field-Driven Manipulation of High Aspect Ratio Nanoparticles in Model Fluids and Polymers	Applied Materials, Inc., Santa Clara, CA
Sujay Deshmukh	MS	12/2006	Effect of Single Wall Carbon Nanotubes (SWNT's) on the Electromechanical Response of a Polyimide Nanocomposite	PhD then Intel Inc. (see above)
Atheer Almasri	MS	12/2006	Characterization of DWNT-PVDF Nanocomposites	Associate Prof. at King Faisal University

MENTORING OF GRADUATE STUDENTS | Virginia Commonwealth University

Student Name	Type of Degree	Date Degree Granted (Mo/Yr)	Title of Thesis	Most Recent Home
Ihab Abdelsayed	MS	08/2005	Characterization of Electrosprayed Polyvinylidene Fluoride and Polyvinylidene Fluoride/CNT Nanocomposites	PhD at VCU
Wrutu Parulkar	MS	12/2005	Electomechanical Characterization of PDMS-Based Electroactive Polymers	Materials Scientist at Applied Materials Inc.
Sumanth Banda	MS	12/2004	Characterization of Aligned Carbon Nanotube/Polymer Composites	PhD at Texas A&M (see above)

MENTORING OF UNDERGRADUATE STUDENTS

Student Name	Type of Degree	Program/Dept	Title of Honor Thesis or Research Topic
Sarah Chekan	BS	Shreyer Honors College/Mech Eng	An Investigation of Local and Global Magnetoactive Gradients in 3D-Printed Multi-Stimuli Responsive Shape Memory Polymer Composites
Daniel Strobel	BS	Shreyer Honors College/Mech Eng	An Investigation of Local and Global Magnetoactive Gradients in 3D-Printed Multi-Stimuli Responsive Shape Memory Polymer Composites

Ethan Iatesta	BS	Shreyer Honors College/Mech Eng	Magneto-Active Actuation for Adaptive Architecture
Tyler Reinert	BS	Shreyer Honors College/Mech Eng	On the 3D Printing of Biopolymers
Neal Desai	BS	MATSE Undergrad. research	Magneto-Active Origami Inspired Actuation
Imani Murray	BS	MATSE undergrad. Thesis	Processing of Biopolymer Inks
Kathryn von Abo	BS	MATSE undergrad. Thesis	Triboelectric Characterization of PDMS-Based Materials
Karim Barsom (co-advised)	BS Honors	Shreyer Honors College/Mech Eng	Direct Ink Writing of Piezoelectric BTO
Nathan Gardner (co-advised)	BS Honors	Shreyer Honors College	Design and Development of a Custom DIW Printer
Dungan Adams (co-advised)	BS	Drawdown REU	Modeling of Ceramic Extrusion
Dashiell Papuela	BS	NSF REU/MATSE	Multifunctional Composites
Arielle Berman	BS Honors	Shreyer Honors College	Effect of Aging on the Mechanical and Thermal Properties of Thermoset Polyvinyl Toluene
Jonathan Hong	BS Honors	Shreyer Honors College	Engineering Controlled Folding in Electroactive Polymers in Response to an Electric Field
Brian Smith	BS	NSF REU	Mechanical Testing of Piezoelectric Fibers
Erika Arrojado	BS	Shreyer Honors College	Active Origami Using Electroactive Polymers (Honors Thesis)
Sarah Masters	BS	Shreyer Honors College	Multifield Actuation of Smart Polymers (Honors Thesis)

Julia Meyer	BS	Shreyer Honors College	Multifield Responsive Elastomers for Origami Engineering (Honors Thesis)
Aziz Dridi	BS/MS	Exchange student from Tunisia-NSF IIMEC	Dynamic Mechanical Characterization of Piezoelectric Active Fiber Composites
Hichem Abdelmoula	BS/MS	Exchange student from Tunisia-NSF IIMEC	FEA of Dielectric Particle in Fluidic and Prepolymer Media
Amal Kadimi	BS/MS	Exchange student from Morocco-NSF IIMEC	Processing and Characterization of Cellulose-Based Composites
Scott Roman	BS	Toshiba Westinghouse Fellow Summer Research Experience	Novel Composites for Shielded Special Nuclear Materials
Savannah Messenger	BS	Shuman Scholar in MNE	Thermal Stability of Nanocomposites
Abderrahmane Ayadi	BS/MS	Exchange student from Tunisia-NSF IIMEC	Voltage Breakdown Characterization of Polymer Nanodielectrics
Alison Cowley	BS	Toshiba-Westinghouse Fellow Summer Research Experience	Graphene-Polymer Nanocomposites for Energy Storage Applications
Michael Melnyk	BS	Toshiba-Westinghouse Fellow Summer Research Experience	Graphene Processing for Battery Applications
Ali Khadimallah	BS/MS	Exchange student from Tunisia-NSF IIMEC	Investigating the Effect of Geometrical Parameters Variation on AFCs Performance
Jackie Wojewoda	BS	Toshiba-Westinghouse Fellow Summer Research Experience	Processing and Characterization of Piezoelectric Composites and Effects of Gamma Radiation
Jacob Andersson	BS	Toshiba-Westinghouse Fellow Summer Research Experience	Processing and Characterization of Piezoelectric Composites and Effects of Gamma Radiation

Alex Pankonien	BS	University Research Scholars Program	Electrospining of Cellulose Nanofibers for Smart Biomimetic (Honors Thesis)
Ainsley VanRooyen	BS	University Research Scholars Program	Multiscale Reinforced Carbon Fiber Nanocomposites (Honors Thesis)
Jessica Dowden	BS	EMCLab Undergraduate Researcher	Semicrystalline Polymer Nanocomposites for Biomedical Applications
Casey Whalen	BS	EMCLab Undergraduate Researcher	Dispersion of Carbon Nanofibers in Epoxy
Staci Cooper	BS	EMCLab Undergraduate Researcher	Electrospinning of PVDF-TrFE Copolymer
Josh Osterhout	BS	EMCLab Undergraduate Researcher	Cellulose-Based Polymer Nanocomposites
Natasha Lagoudas	BS	University Research Scholars Program	Electrospinning of Continuous Piezoelectric Yarns for Composite Application (Honor Thesis)
Simon Abramov	BS	EMCLab Undergraduate Researcher	Electrospinning of Piezoelectric Copolymers
Antonio Rucker	BS	EMCLab Undergraduate Researcher	Mechanical Characterization of Epoxy Nanocomposites
Brad Toellner	BS	EMCLab Undergraduate Researcher	Microscopy Characterization of Nanocomposites
Justin Maddox	BS	College of Eng. REU Program	Processing and characterization of PVDF as a Biomedical Sensor
Justin George	BS	College of Eng. REU Program	Piezoelectric Polymer Sensor
Erin Lee	BS	College of Eng. REU Program	Alignment of Carbon Nanofiber/Polymer Composites

MENTORING OF POSTDOCTORAL FELLOWS

Name	**Date**	**Research Topic**
Xiaoyue Zhang, Ph.D.	2023-Present	Additive Manufacturing of Responsive Materials
Hassene Ben Attitallah, Ph.D.	2015-2017	Multilayered Pressure Sensor

Amira Barhoumi Meddeb, Ph.D.	2013-2015	Organic-Inorganic Hybrids for Energy Storage Currently Associate Research Professor
Mariem Sarakarat, Ph.D.	2012-2014	Synthesis and Manipulation of High Permittivity Ferroelectric Ceramics
Mehdi Mirsaneh, Ph.D.	2011-2012	Nanocomposite Processing for High Breakdown Applications
Ricardo Perez, Ph.D.	2005-2007	Dielectric and Electromechanical Behavior of Piezoelectric Polymer-Based Composites

TEACHING

The Pennsylvania State University

Undergraduate

ME 440: Senior Capstone Design
ME 340: Mechanical Engineering Design Methodology
ME 345: Instrumentation, Measurements, and Statistics
ME 101S: Toy Fundamentals: First-Year Seminar
ME 102S: Smart Lego Robots & Design: First-Year Seminar

Graduate

ME 597B: Mechanics of Smart Materials
ME 597D: Experimental Methods in Mechanical Engineering
ME 597B: Experimental Methods in Mechanical Engineering

Texas A&M University

Undergraduate

AERO 213: Materials Science for Engineers
AERO 406: Polymer Nanocomposites and their Applications
AERO 489: Special Topic in Materials Science

Graduate

AERO /MEMA/MSEN 606: Multifunctional Materials
AERO 689: Special Topic in Multifunctional Materials

Virginia Commonwealth University:

Undergraduate

EGRM 201: Engineering Statics
EGRM 202: Mechanics of Materials
EGRM 436: Engineering Materials
ENGR 309: Principles of Materials Science and Engineering
ENGR 591: Smart Materials

Graduate

ENGR 691: Advanced Smart Materials

Awards Won by Advised Students (Selected)

2023- Xiaoyue Zhao-Harold K. Schilling Dean's Outstanding Graduate Student Graduate Scholarship

2021- Xiaoyue Zhao-1st Place, Best Student Paper Competition at the ASME SMASIS 2021 Conference

2020-Xiaoyue Zhao-*Third Place Winner*, ASME SMASIS 2020 Best Student Paper Competition.

2015-Saad Ahmed- *First Place Winner*, Student Poster Session Competition, Center for Acoustics and Vibration (CAV) Workshop 2015, Center for Acoustics and Vibration (CAV), The Pennsylvania State University

2012- Payam Khodaparast- *First Place Winner,* 10th annual Graduate Research Poster Competition, Materials Science and Engineering Department, The Pennsylvania State University.

2012- Sanjay Kalidindi- *First Place Winner*, Best Poster at the third annual meeting of the National Science Foundation International Institute for Multifunctional Materials for Energy Conversion.

2011- Payam Khodaparast-*Best in Show*, Materials Visualization Competition, Materials Science and Engineering Department, The Pennsylvania State University.

2010- Payam Khodaparast- *Society of Polymer Engineering Henry Kahn Scholarship* for Outstanding Graduate Polymer-Related Research.

2008- Alexander Pankonien- *Society of Polymer Engineering Dale Walker Memorial Scholarship* for Undergraduate Polymer-Related Research.

2007- Sumanth Banda- *Society of Polymer Engineering Henry Kahn Scholarship* for Outstanding Graduate Polymer-Related Research.

2007-Natasha Lagoudas-*First Place*, Society of Engineering Science Student Poster Competition.

2007-Sumanth Banda-*Second Place*, Society of Engineering Science Student Poster Competition.

2007-Natasha Lagoudas-*First Place*, Nanosummit 2007, Texas A&M University.

2004-Sumanth Banda-*Third Place*, SPIE/ASME Best Student Paper Contest at the 11th SPIE International Symposium: Smart Structures and Materials, March 2004.

2003-Sumanth Banda-*First Place,* Student Poster Competition-National Educators Workshop, NASA Langley Research Center, VA, Oct 2003.

2003-Jared Rud and David Callahan-*First Place,* Student Poster Competition-National Educators Workshop, NASA Langley Research Center, VA, Oct 2003.

SERVICE

Membership in Professional Societies

Fellow, The International Society for Optical Engineering (SPIE)

Fellow, American Society of Mechanical Engineers (ASME)

Member, Adaptive Structures and Materials Systems (ASMS) Branch; ASME 2012-present.

Member, Adaptive Structures and Materials Systems (ASMS) Technical Committee; ASME 2003-2012.

Member, organizing committee, National Educator's Workshop (NEW), 2002-2005.

Member, American Institute of Aeronautics and Astronautics (AIAA)

Service to the Profession (Selected)

Session Organizer and Lead, The Gordon Research Conference on Multifunctional Materials and Structures, Ventura, CA (2024)

Member of the Scientific Advisory Board, Living, Adaptive and Energy-autonomous Materials Systems Cluster of Excellence, University of Freiburg, Germany (2023-Present)

Program Committee Member, Bioinspiration, Biomimetics, and Bioreplication XIV, SPIE Smart Structures and Materials/NonDestructive Evaluation International Conference, (2023-Present)

Program Committee Member, Behavior and Mechanics of Multifunctional Materials, SPIE Smart Structures and Materials/NonDestructive Evaluation International Conference, (2010-Present)

Jury and PhD Committee Member, Ph.D. Dissertation Defense, National Institute of Applied Science (INSA), Lyon, France (2023)

Chair, SPIE Smart Structures and Materials/NonDestructive Evaluation International Conference (2019-2021)

Co-chair, SPIE Smart Structures and Materials/NonDestructive Evaluation International Conference (2017-2019)

Guest Editor, Special Issue on *Smart-Material-Based Energy Harvesting for Autonomous Robots and Sustainable Energy Systems*, Frontiers in Robotics and AI Journal, September 2021 – 2023

Guest Editor, Focus Issue on *Engineered Living Materials*, Smart Materials and Structures Journal, January 2022 – 2023

Associate Editor and Member of the editorial board, Smart Materials and Structures Journal, January 2021 – 2023

Associate Editor and Member of the editorial board, Journal of Intelligent Materials Systems and Structures, January 2010 – 2023

Chair, American Society of Mechanical Engineers Aerospace Division (2017-2019)

Chair, ASME Adaptive Structures and Materials Systems Branch (2012-2013)

Chair, Behavior and Mechanics of Multifunctional Materials Conference, SPIE Smart Structures and Materials/NonDestructive Evaluation International Conference, (2010-Present)

Jury Member, Faculty Promotion Committee, National Institute of Applied Science (INSA), Lyon, France (2020)

Jury Member, Ph.D. Defense, National Institute of Applied Science (INSA), Lyon, France (2023; 2020)

Co-Organizer, Materials Day 2020: Convergence of Materials and Life, (May 2020 – November 2020).

Organizer, Webinar, Convergence Center for Living Multifunctional Material Systems, University Park, PA USA. (December 15, 2020)

Organizer, Research Workshop, Convergence Center for Living Multifunctional Material Systems, University Park, PA USA. (July 22, 2020 - July 23, 2020).

Program committee member, 36th International Conference of The Polymer Processing Society, Committee Member. (October 2019 - May 2020).

Organizer, Research Workshop, Convergence Center for Living Multifunctional Material Systems, , International. University Park, PA USA. (May 27, 2020 - May 28, 2020).

Co-chair, SPIE Smart Structures and Materials/NonDestructive Evaluation Symposium (2017-2019)

Guest Editor, Special Issue on *Smart-Material-Based Energy Harvesting for Autonomous Robots and Sustainable Energy Systems*, Frontiers in Robotics and AI Journal, September 2021 – 2022

Guest Editor, Focus Issue on *Engineered Living Materials*, Smart Materials and Structures Journal, January 2022 – Present

Guest editor, Special Issue on Origami Engineering, Journal of Intelligent Materials Systems and Structures, 2014

ASME Adaptive Structures and Materials Systems Branch, Chair (2012-2013), Vice-chair (2011-2012), Secretary (2010-2012), Treasurer (2005-2010), Elected member (2004-present)

Co-organizer and session co-chair, “Active Materials and Structures for Origami Engineering”, SPIE SSM/NDE (2018); ASME SMASIS (2013, 2014)

Organizer, TMS Middle East - Mediterranean Materials Congress on Energy and Infrastructure Systems (MEMA 2015), Doha, Qatar, 2014-2015.

Organizer, Special Symposium, Nanocomposites, XV Pan-American Congress on Applied Mechanics (PACAM), University of Illinois at Urbana-Champaign (IL), (2014- 2015).

Vice-chair (elected), ASME Adaptive Structures and Materials Systems (ASMS) Technical Committee, (2011- 2012)

Guest Editor, Special Issues on Multifunctional Materials, the Journal of Smart Materials and Structures, 2011, 2012, 2013

Editor, SPIE Smart Structures and NDE Conference Proceedings, Behavior and Mechanics of Composite Materials, (2005 – 2011)

University Service (Selected)

Chair and Organizer, Biomaterials and Nature-Based Solutions Conference, LiMC2, Penn State University, (June 14-15, 2024)

Member, Joint Penn State-Auckland University Advisory Committee, Penn State Global, (April 2024-Present)

Member, Penn State Global Strategic Plans Committee, Penn State Global, (January 2023-July 2024)

Co-Chairperson, University Executive VP for Research Committee on Industry Research, (January 2023 - 2024).

Board Member, Strategic Interdisciplinary Research Office (SIRO) Advisory Board, Office of the Senior Vice President for Research, Board Member. (January 2023 - Present).

Faculty Mentor, Faculty Mentoring Program, Department of Energy and Mineral Engineering, (August 2023 - Present).

Member, Global Partnerships Strategy Task Force, Penn State Global, (January 2023 - 2024).

Member, University OSVPR Institutes' Social Justice Advisory Council, (January 2020-2023).

Member, The Institutes for Energy and the Environment (IEE) Leadership Team and Program Leads Committee, (June 2020 – 2023)

Member, Search Committee for the Assistant/Associate Vice Provost for Faculty Affairs, Faculty Development, Office of the Vice President for Faculty Affairs, Committee Member. (March 2020 - December 2020).

Member, Materials Characterization Laboratory Leadership Committee, The Pennsylvania State University (2013 – 2023)

Member (elected), Graduate Council, The Pennsylvania State University (2013 – 2015)

Member, Graduate Students and Faculty Issue Committee, The Pennsylvania State University (August 2013 – 2015)

Faculty Advisor, Nanotechnology and Nanoscience Student Association, Texas A&M University (2006-2009).

Faculty Research Advisor, University Research Scholars Program, Texas A&M University (2007-2008)

College of Engineering Service (Selected)

Member, SEDI P&T Committee, The Pennsylvania State University (July 2023 - Present).

Member (elected), P&T Committee, College of Engineering, The Pennsylvania State University (2021 – 2023).

Member, Search Committee for the Dean of the College of Engineering, College of Engineering, The Pennsylvania State University (December 2016 - May 2017).

Member, Search Committee for the Associate Dean for Research of the College of Engineering, College of Engineering, The Pennsylvania State University (December 2015 - May 2016).

Member Engineering Faculty Council, The Pennsylvania State University (August 2014 – 2016)

Member, COE Academic Integrity Committee, The Pennsylvania State University (August 2014 – 2015)

Member, Strategic Planning Committee, College of Engineering, Texas A&M University (2008-2010)

Instructor, Discover Engineering, two workshops taught on 'Getting Smart with Materials' and 'Can we learn Science by Making Ice Cream', College of Engineering, Texas A&M University (2005, 2006)

Instructor, Society of Women Engineering Summer Camp, College of Engineering, Texas A&M University (Summer 2006)

Faculty Advisor, local chapter of SWE, Society of Women Engineers,Texas A&M University (2004-2005).

Faculty Mentor, Research Experience for Undergraduates (REU), College of Engineering, Texas A&M University, (2005-2010)

Departmental Service (Selected)

Group Lead, Research Advancement Committee, Department of Mechanical Engineering, (August 2022 - Present).

Faculty Mentor, Faculty Mentoring Program, Department of Mechanical Engineering, (August 2020 - Present).

Chair, Career Advancement Committee, Department of Mechanical Engineering (August 2021-2022).

Member, Department of Mechanical Engineering Diversity Equity and Inclusion committee (August 2021-2022).

Chair, Department of Mechanical Engineering Diversity Equity and Inclusion committee (March 2021-August 2021).

Member, Department Head Search Committee, Department of Mechanical Engineering. (November 2020 – May 2020).

Qualifier Exam Committee Member and Proposal Reviewer, MATSE qualifier exam committee, Examiner. (July 2020 - August 2020).

ME Lab Re-Opening Committee, Committee Member (May 2020 – July 2020).

Associate Head for Administration, Department of Mechanical Engineering (August 2016 – June 2020).

Member, ME Executive Committee (August 2016-June 2020).

Chair, Research Advancement Committee (August 2018-present).

Member, Faculty Development Committee (August 2018-July 2021).

Member (elected), P&T Committee, The Pennsylvania State University (2019 – 2021).

Member, MNE Everett and Glenn Professorships Selection Committee (October 2016 - March 2017).

Chair, Oversight Faculty Search Committee, Department of Mechanical Engineering, The Pennsylvania State University (2016 – present).

Chairperson, ME course caucus for ME 345 (August 1, 2014 - January 2017).

Chair, ME Faculty Search Committee, The Pennsylvania State University (2013 – 2014).

Member, Written English Assessment Post-Candidacy Exam, The Pennsylvania State University (2013- 2014).
Advisor and Member, Schreyer Scholars Advising, The Pennsylvania State University (2011 – 2017).

Member, Graduate Policy Committee, The Pennsylvania State University (2011 – 2013).

Member, ME Faculty Search Committee, The Pennsylvania State University (2011 – 2012).

Member (elected), P&T Committee, The Pennsylvania State University (2012 – 2015).

Member, ME Course Caucus for ME 345, The Pennsylvania State University (2014 – present).

Member, Special ME 340 Committee, The Pennsylvania State University (2014 – present).

Member, Advisory Committee, Materials Science and Engineering Program, Texas A&M University (Spring 2007).

Member, Curriculum Committee, Materials Science and Engineering Program, Texas A&M University (2005-2009).

Manuscripts and Proposal Reviewer

PROPOSALS REVIEW

I have served as reviewer on many panels as well as an individual reviewer for the National Science Foundation, the National Aeronautics and Space Administration, the National Research Council, the Air Force Office of Scientific Research, the Army Research Office, The Office of Naval Research.

MANUSCRIPTS REVIEW

I have served as referee to many journals including: ASME Journal of Applied Mechanics; Smart Materials and Structures; Composites Science and Technology; European Polymer Journal; Polymer International; Macromolecules; Advanced Materials; Journal of Intelligent Materials Systems and Structures; Applied Physics Letters; Journal of Polymer Chemistry; Journal of Polymer Science Part B: Polymer Physics; Langmuir.