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Education

Ph.D. August 2000	Physics, University of Tennessee (UTK), Knoxville Dissertation title: *"Collective Electronic Effects in Scanning Probe Microscopy"* Advisor: Prof. Thomas L. Ferrell, Oak Ridge National Laboratory (ORNL)
M.S. January 1993	Physics, Royal Institute of Technology (RIT) - Stockholm, Sweden Thesis title: *"A Spectroscopic Study of Wall Conditioning on ALCATOR C-MOD Tokamak"* Advisors: Prof. Elisabeth R. Källne, RIT and Dr. Earl S. Marmar, Massachusetts Institute of Technology (MIT)

Summary

My work has been driven by the physics of sensing and imaging including interests in optical and plasmonic surface modes of nanoparticles, nanostructures, and thin multilayer films, the interaction of light with nanomechanical systems, contact and noncontact material characterization, and quantum sensing. This encompasses a broad class of systems in which specific surface states and modes, and more generally light-matter interaction, can be utilized to achieve energy conversion, light-by-light modulation, micro- and nanofluidic actuation, on-chip trapping and pumping, and biomedical and environmental applications. Exploring the nearfield and scattering properties of optical and mechanical probes, as well as optical response of materials, I am exploring hybrid optomechanical nanometrology, low count photon and electron detection and generation, including cases where the quantum nature of the light and the mechanical state may offer unique opportunities.

Professional Positions and Affiliations

2014 – Present	Research and Development Staff Member, Quantum Information Science, Computational Sciences and Engineering Division, ORNL
2012 – 2021	Joint Faculty Professor, Department of Chemical & Biomolecular Engineering, UTK
2012 – 2016	Research Director, National Cancer Institute's Physical Sciences-Oncology Centers Data Coordinating Center (PS-OC DCC) at UTK/ORNL
2010 – 2014	Research and Development Staff Member, Measurement Science and Systems Engineering Division, ORNL
2010 – Present	Holding visiting professor fellowships, at Ecole Centrale Marseille, and Aix-Marseille Université in the Institut Fresnel UMR 7249 and ; at the Université Paris-Sud 91405 ORSAY Cedex, France in the ISMO – Institut des Sciences Moléculaires d'Orsay
2007 – 2010	Research and Development Staff Member, Nanoscale science and devices, Biosciences Division, ORNL
2006 – Present	Adjunct, Joint Faculty Associate Professor, Department of Physics, UTK

2002 – 2006	Joint research associate in experimental physics, Photometrics & Nanoscale science and devices, Biosciences Division, ORNL
2000 – 2002	Research Associate, Photometrics, Biosciences Division, ORNL
1997 – 2000	Research Assistantship, plasmonic and photonic scanning tunneling microscope, ORNL
1995 – 2000	Research and Teaching Assistant, Department of Physics and Astronomy, UTK
1994 – 1994	Research Assistant, Institute of Resonance Ionization Spectroscopy (IRIS), UTK
1993 – 1994	Research and Development Engineer, Department of Physics, Stockholm University (SU), Stockholm, Sweden
1993 – 1993	Research assistant, Manne Siegbahn Institute for Atomic Physics, Stockholm, Sweden
1991 –1992	Research assistant, Plasma Science and Fusion Center, MIT, Massachusetts

Refereed publications in review

- A. M. Charrier, A. Normand, **A. Passian**, P. Schaefer and A. L. Lereu, "In-situ plant material hyperspectral imaging: determination of chemistry and optical properties using multimodal scattering nearfield optical microscopy," **Nature Plants (2021).**

Refereed publications (> 105)

2020

- M. Bagherian, **A. Passian**, S. Kouchekian, G. Siopsis, "A quantum Hamiltonian for the surface charge density on a ring torus and radiative decay of plasmons," **Phys. Rev. B 102, 085422 (2020).**
- S. Keramati, **A. Passian**, V. Khullar, H. Batelaan, "Photofield electron emission from an optical fiber nanotip," **Appl. Phys. Lett. 117, 061102 (2020).**
- S. Keramati, **A. Passian**, V. Khullar, J. Beck, C. Uiterwaal, H. Batelaan, "Surface plasmon enhanced fast electron emission from metallised fibre optic nanotips," **New J. Phys. 22, 083069 (2020).**
- D. Niu, M. Zerrad, A. Lereu, A. Moreau, J. Lumeau, J. A. Zapien, **A. Passian**, V. Aubry, and C. Amra, "Excitation of Bloch surface waves in zero-admittance multilayers for high-sensitivity sensor applications," **Phys. Rev. Appl. 13(5), 054064 (2020).**
- R. H. Farahi, A. L. Lereu, A. M. Charrier, U. C. Kalluri, B. H. Davison, and **A. Passian,** " Nanomechanics and Raman spectroscopy of in situ native carbohydrate storage granules for enhancing starch quality and lignocellulosic biomass production," **ACS Omega 5(6), 2594-2602 (2020).**

2019

- **A. Passian,** N. Imam, "Nanosystems, edge computing, and the next generation computing systems," **Sensors (Basel, Switzerland) 19(18), 4048 (2019) DOI: 10.3390/s19184048.**
- A. L. Lereu, F. Lemarchand, M. Zerrad, D. Niu, V. Aubry, **A. Passian**, and C. Amra, "Sensitivity of resonance properties of all-dielectric multilayers driven by statistical fluctuations," **Optics Express 27(21) 30654 (2019).**

- Z. Li, K. Jiang, F. Khan, A. Goswami, J. Liu, **A. Passian**, and T. Thundat, "Anomalous interfacial stress generation during sodium intercalation/extraction in MoS_2 thin film anodes," **Science Advances 5, 1, eaav2820 (2019).**

2018

- M. Bagherian, S. Kouchekian, I. Rothstein, and **A. Passian**," Quantization of surface charge density on hyperboloidal and paraboloidal domains with application to plasmon decay rate on nano-probes," **Phys. Rev. B 98, 125413 (2018).**
- A. M. Charrier, A. L. Lereu, R. H. Farahi, B. H. Davidson, and **A. Passian**, "Nanometrology of biomass for bioenergy: the role of atomic force microscopy and spectroscopy in plant cell characterization," **Frontiers in Energy Research, doi: 10.3389/fenrg.2018.00011 (2018).**
- V. Khullar, G. Gu, **A. Passian**, T. L. Ferrell, "Green's function for a sharpened and metal-coated dielectric probe," **Applied optics 57 (9), 2150-2154 (2018).**
- C. Amra, M. Zerrad, F. Lemarchand, A. Lereu, **A. Passian**, J. A. Zapien, and M. Lequime, "Energy density engineering via zero-admittance domains in all-dielectric stratified materials," **Phys. Rev. A 97, 023819 (2018).**
- K. V. Garapati, M. Bagherian, **A. Passian**, and S. Kouchekian, "Plasmon dispersion in a multilayer solid torus in terms of three-term vector recurrence relations and matrix continued fractions," **J. Phys. Commun. 2, 015031 (2018).**

2017

- A. L. Lereu, M. Zerrad, **A. Passian,** and C. Amra, "Surface plasmons and Bloch surface waves: Towards optimized ultra-sensitive optical sensors," **Appl. Phys. Lett. 111, 011107 (2017).**
- **A. Passian**, and G. Siopsis, "Quantum state atomic force microscopy," **Phys. Rev. A, 95, 043812 (2017).**
- V. Garapati, M. Salhi, S. Kouchekian, G. Siopsis, and **A. Passian**, "Poloidal and toroidal plasmons and fields of multilayer nanorings," **Phys. Rev. B, 95, 165422 (2017).**
- R. H. Farahi, A. Charrier, A. Tolbert, A. L. Lereu, A. Ragauskas, B. H. Davison, **A. Passian**, "Plasticity, elasticity, and adhesion energy of plant cell walls: nanometrology of lignin loss using atomic force microscopy," **Scientific Reports, 7, 152 (2017).**
- A. K. Tolbert, J. M. Young, S. Jung, D. Chung, **A. Passian**, J. Westpheling, and A. J. Regauskus, "Surface Characterization of Populus during Caldicellulosiruptor bescii Growth by TOF-SIMS Analysis," **ACS Sustainable Chem. Eng., 5(3), 2084 (2017).**

2016

- **A. Passian** and G. Siopsis, "Strong quantum squeezing near the pull-in instability of a nonlinear beam," **Phys. Rev. A 94, 023812 (2016).**
- R. Alaee, M. Kadic, C. Rockstuhl, and **A. Passian**, "Optically assisted trapping with high-permittivity dielectric rings: Towards optical aerosol filtration," **Appl. Phys. Lett. 109, 141102 (2016).**

2015

- M. Salhi, **A. Passian**, and G. Siopsis, "Toroidal nanotraps for cold polar molecules," **Phys. Rev. A 92, 033416 (2015).**
- L. Tetard, **A. Passian**, R. H. Farahi, T. Thundat, and B. H. Davison, "Opto-nanomechanical spectroscopic material characterization," **Nature Nanotechnology, 10, 870-877 (2015).**
- A. L. Lereu, F. Lemarchand, M. Zerrad, M. Yazdanpanah, and **A. Passian,** "Optical properties and plasmonic response of silver-gallium nanostructures," **J. Appl. Phys., 117, 063110 (2015).**

2014

- V. V. Zaharov, R. H. Farahi, P. J. Snyder, B. H. Davison, and **A. Passian,** "Karhunen-Loeve treatment to remove noise and facilitate data analysis in sensing, spectroscopy and other applications," **Analyst 139(22), 5927-5935 (2014).**
- E. Finot, A. Fabre, **A. Passian**, T. Thundat, "Dynamic and static manifestation of molecular absorption in thin films probed by a microcantilever," **Phys. Rev. Applied 1, 024001 (2014).**
- M. Ewald, L. Tetard, C. Elie-Caille, L. Nicod, **A. Passian**, E. Bourillot and E. Lesniewska, "From surface to intracellular non-invasive nanoscale study of living cells impairments," **Nanotechnology 25, 295101 (2014).**
- N. Bajwa, C. J. Maldonado, T. Thundat and **A. Passian**, "Piezoresistive measurement of Swine H1N1 Hemagglutinin peptide binding with microcantilever arrays," **AIP Advances 4, 037118 (2014).**

2013

- A. L. Lereu, R. H. Farahi, L. Tetard, S. Enoch, T. Thundat, and **A. Passian**, "Plasmon assisted thermal modulation in nanoparticles", **Optics Express 21(0) 12145 (2013).**
- **A. Passian**, L. Tetard, T. Thundat, "Comments on the paper "A comprehensive modeling and vibration analysis of AFM microcantilevers subjected to nonlinear tip-sample interaction forces" by Sohrab Eslami and Nader Jalili" **Ultramicroscopy, : 131, 92-93 (2013).**
- R. H. Farahi, **A. Passian**, V. V. Zaharov, T. Thundat and L. Tetard, "Data analysis of multi-laser standoff spectral identification of chemical and biological compounds," **Invited Paper: Proc. of SPIE, Vol. 8725, 87252A (2013).**

2012

- L. Tetard, **A. Passian**, S. Jung, A. J. Ragauskas, and B. H. Davison, "Development of New Methods in Scanning Probe Microscopy for Lignocellulosic Biomass Characterization," **Industrial Biotechnology 8(4), 245-249 (2012).**
- **A. Passian** and T. Thundat, "The abilities of instabilities," **Nature 487, 440–441 (2012).**
- R. H. Farahi, **A. Passian**, L. Tetard, T. Thundat, "Critical issues in sensor science to aid food and water safety," **ACS Nano 6(6), 4548–4556 (2012).**
- R. H. Farahi, **A. Passian**, L. Tetard, T. Thundat, "Pump-probe photothermal spectroscopy using quantum cascade lasers," **J. Physics D, 45, 125101 (2012).**
- A. L. Lereu, **A. Passian**, R. H. Farahi, L. Abel-Tiberini, L. Tetard, T. Thundat, "Spectroscopy and imaging of arrays of nanorods toward nanopolarimetry", **Nanotechnology 23, 045701 (2012).**
- A. L. Lereu, **A. Passian**, Ph. Dumas, "Near field optical microscopy: a brief review," **International Journal of Nanotechnology 9(3), 488-501 (2012).**
- N. Bonod, A. Bouhelier, A. F. Koenderink, and **A. Passian**, "Optical Antennas" **International Journal of Optics, Volume 2012 (2012), doi:10.1155/2012/365109.**
- L. Tetard, **A. Passian**, R. H. Farahi, B. H. Voy, T. Thundat, "Applications of Subsurface Microscopy," in Nanotoxicity: Methods and Protocols, Edited by Joshua Reineke, **Series: Methods in Molecular Biology, Vol. 926, 2012 (ISBN 978-1-62703-001-4).**

2011

- L. Tetard, **A. Passian**, R. H. Farahi, B. H. Davison, S. Jung, A. J. Ragaukas, A. L. Lereu, T. Thundat, "Nanometrology of delignified Populus using mode synthesizing atomic force microscopy", **Nanotechnology 22(46), 465702 (2011).**
- **A. Passian**, S. Koucheckian, S. Yakubovich, "Index integral representations for connection between cartesian, cylindrical, and spheroidal systems," **Integral Transforms and Special Functions 22(8), 549-560 (2011**).

- L. Tetard, **A. Passian**, R. H. Farahi, S. Eslami, N. Jalili, T. Thundat, "Virtual Resonance and Frequency Difference Generation by van der Waals Interaction," **Phys. Rev. Lett. 106(18), 180801 (2011).**
- L. Tetard, **A. Passian**, R. H. Farahi, B. H. Davison, A. L. Lereu, T. Thundat, "Optical and plasmonic spectroscopy with cantilever shaped materials", **J. Physics D 44(44), 445102 (2011).**
- D. Brissinger, A. L. Lereu, L. Salomon, T. Charvolin, B. Cluzel, C. Dumas, **A. Passian,** F. de Fornel, "Discontinuity induced angular distribution of photon plasmon coupling," **Optics Express, 19(18), 17750-17757 (2011).**
- **A. Passian**, R. H. Farahi, L. Tetard, A. L. Lereu, S. Gleason, "Nanoplasmonics in energy and biomedical research," **IEEE Xplore doi: 10.1109/FIIW.2011.6476829.**
- L. Tetard, **A. Passian**, R. H. Farahi, B. H. Davison, T. Thundat, "Optomechanical spectroscopy with broadband interferometric and quantum cascade laser sources," **Optics Letters 36(16), 3251-3253 (2011).**

2010

- S. Kim, D. Yi, **A. Passian**, and T. Thundat, "Observation of an anomalous mass effect in microcantilever-based biosensing caused by adsorbed DNA," **Appl. Phys. Lett. 96, 153703 (2010).**
- L. Tetard, **A. Passian**, T. Thundat, "New modes for subsurface atomic force microscopy through nanomechanical coupling," **Nature Nanotechnology 5, 105 (2010).**
- **A. Passian,** S. Kouchekian, S. Yakubovich, and T. Thundat, "Properties of index transforms in modeling of nanostructures and plasmonic systems," **Journal of Mathematical Physics 51, 023518 (2010).**
- L. Tetard, **A. Passian**, R. H. Farahi, U. C. Kalluri, B. H. Davison, and T. Thundat, "Spectroscopy and atomic force microscopy of biomass," **Ultramicroscopy doi:10.1016/j.ultramic.2010.02.035 (2010)**.
- S. Eslami, N. Jalili, **A. Passian**, L. Tetard, T. Thundat, "Nonlinear interaction force analysis of microcantilevers utilized in atomic force microscopy," **ASME, Dynam Syst & Control Div, PTS A AND B 781-788 (2010).**
- L. Tetard, **A. Passian**, R. H. Farahi, and T. Thundat, "Atomic force microscopy of silica nanoparticles and carbon nanohorns in macrophages and red blood cells," **Ultramicroscopy doi:10.1016/j.ultramic.2010.02.015 (2010)**.

2009

- R. H. Farahi, **A. Passian**, Y. K. Jones, L. Tetard, A. L. Lereu, and T. G. Thundat, "Laser reflectometry of submegahertz liquid meniscus ringing," **Opt. Lett. 34, 3148-3150 (2009).**
- **A. Passian**, H. Simpson, S. Kouchekian, S. B. Yakubovic, On the orthogonality of the MacDonald's functions, **Journal of Mathematical Analysis and Applications 360(2), 380-390 (2009).**

2008

- L. Tetard, **A. Passian**, R. M. Lynch, B. H. Voy, G. Shekhawat, V. P. Dravid, T. Thundat, "Elastic phase response of silica nanoparticles buried in soft matter," **Appl. Phys. Lett. 93, 133113 (2008).**
- L. Tetard, **A. Passian**, K. T. Venmar, R. M. Lynch, B. H. Voy, G. Shekhawat, V. P. Dravid, T. Thundat, "Imaging nanoparticels in cells by nanomechanical holography", **Nature Nanotechnology 3, 501 (2008)**.
- A. L. Lereu, G. Sanchez-Mosteiro, P. Ghenuche, **A. Passian**, R. Quidant, M. Garcia-Parajo, N. F. van Hulst, "Probing the local field of nanoantennas using single particle luminescence," **Journal of Physics: CS 100, 052038 (2008)**.
- A. L. Lereu, **A. Passian**, R. H. Farahi, N. F. van Hulst, T. L. Ferrell, T. Thundat, "Thermoplasmonic shift and dispersion in thin metal films," **J. Vac. Sci. Technol. A 26, 836 (2008).**

- R. Desikan, L. Tetard, R. Datar, **A. Passian**, T. Thundat, "Nanomechanical Methods to Study Single Cells," in "Accessing Uncultivated Microorganisms," **ASM, ISBN: 1555814069 (2008)**.
- E. Finot, **A. Passian**, T. Thundat, "Measurement of mechanical properties of cantilever shaped materials," **Sensors 8, 3497 (2008).**

2007

- **A. Passian**, A. L. Lereu, D. Yi, S. Barhen, T. Thundat, "Stochastic excitation and delayed oscillation of a micro-oscillator," **Phys. Rev. B 75, 233403 (2007); Virtual Journal of Nanoscale Science & Technology 15 (25) (2007).**
- **A. Passian**, A. L. Lereu, R. H. Farahi, T. L. Ferrell, and T. Thundat, "Thermoplasmonics in thin solid films," in **Trends in Thin Solid Films Research, NOVA, ISBN: 1-60021-455-X (2007).**
- D. Yi, **A. Passian**, T. Thundat, "An experimental investigation of analog delay generation for dynamic control of microsensors," **Ultramicroscopy 107, 1020 (2007).**
- P. G. Evans, **A. Passian**, T. L. Ferrell, "A spectroscopic investigation of the shape dependency of gold nano-particles grown on roughened surfaces," **Ultramicroscopy 107, 1012 (2007).**

2006

- A. L. Lereu, **A. Passian**, R. H. Farahi, S. Zahrai, and T. Thundat, "Plasmonic Marangoni Forces," **J. Eur. Opt. Soc. Rapid publications 1, 06030 (2006).**
- **A. Passian**, V. Protopopescu, and T. Thundat, "Fluctuation and dissipation of a stochastic micro-oscillator under delayed feedback," **J. Appl. Phys. 100, 114314 (2006).**
- **A. Passian**, S. Zahrai, A. L. Lereu, R. H. Farahi, T. L. Ferrell, and T. Thundat, "Nonradiative surface plasmon assisted microscale Marangoni forces," **Phys. Rev. E 73, 066311 (2006).**
- **A. Passian**, A. L. Lereu, R. H. Ritchie, F. Meriaudeau, T. Thundat, and T. L. Ferrell, "Surface plasmon assisted thermal coupling of multiple photon energies," **Thin Solid Films 497, 315 (2006)**.
- R. H. Farahi, **A. Passian**, S. Zahrai, A. L. Lereu, T. L. Ferrell, and T. Thundat, "Microscale Marangoni actuation: All-optical and all-electrical methods," **Ultramicroscopy 106(8-9), 815 (2006).**
- A. Wig, E. T. Arakawa, **A. Passian**, T. L. Ferrell and T. Thundat, "Photothermal spectroscopy of Bacillus anthracis and Bacillus cereus with microcantilevers," **Sensors and Actuators B 114(1), 206 (2006).**

2005

- **A. Passian,** A. L. Lereu, A. Wig, F. Meriaudeau, T. Thundat, and T. L. Ferrell, "Imaging standing surface plasmons by photon tunneling," **Phys. Rev. B 71 (12), 165418-1 (2005).**
- **A. Passian**, R. H. Ritchie, A. L. Lereu, T. Thundat, and T. L. Ferrell, "Curvature effects in surface plasmon dispersion and coupling," **Phys. Rev. B 71 (7), 115425 (2005).**
- A. L. Lereu**, A. Passian**, J-P. Goudonnet, T. Thundat, and T. L. Ferrell "Optical modulation processes in thin films based on thermal effects of surface plasmons," **Appl. Phys. Lett. 86, 154101 (2005).**
- **A. Passian**, A. L. Lereu, E. T. Arakawa, A. Wig, T. Thundat, and T. L. Ferrell, "Modulation of multiple photon energies by use of surface plasmons," **Optics Letters 30 (1), 41 (2005).**
- R. H. Farahi**, A. Passian**, T. L. Ferrell, and T. Thundat, "Marangoni forces created by surface plasmon decay," **Optics Letters 30 (6), 616 (2005).**

2004

- **A. Passian,** A. Wig, A. L. Lereu, P. G. Evans, F. Meriaudeau, T. Thundat, and T. L. Ferrell, "Probing large area surface plasmon interference in thin metal films using photon scanning tunneling microscopy," **Ultramicroscopy 100 (3-4), 429-436 (2004).**
- A. L. Lereu**, A. Passian**, T. L. Ferrell, and T. Thundat, "Effect of thermal variations on the Knudsen forces in the transitional regime," **Appl. Phys. Lett. 84 (6), 1013-1015 (2004); Virtual Journal of Nanoscale Science & Technology 9 (6) (2004).**
- A. Wig, **A. Passian**, E. T. Arakawa, T. L. Ferrell, and T. Thundat, "Optical thin-film interference effects in microcantilevers," **J. Appl. Phys. 95 (3), 1162-1165 (2004); Virtual Journal of Nanoscale Science & Technology 9 (4) (2004).**
- **A. Passian**, A. L. Lereu, E. T. Arakawa, R. H. Ritchie, T. Thundat, and T. L. Ferrell, "Opto-electronic versus electro-optic modulation," **Appl. Phys. Lett. 85 (14), 2703-2705 (2004).**
- **A. Passian**, A. Wig, A. L. Lereu, F. Meriaudeau, T. Thundat, and T. L. Ferrell, "Plasmon coupling via photon tunneling," **Appl. Phys. Lett. 85 (16), 3420-3422 (2004).**
- R. H. Farahi**, A. Passian**, T. L. Ferrell, and T. Thundat, "Microfluidic manipulation via Marangoni forces," **Appl. Phys. Lett. 85 (18), 4237-4239 (2004); Virtual Journal of Nanoscale Science & Technology 10 (20) (2004).**
- N. Muñoz Aguirre, **A. Passian**, L. Martínez Pérez, E. López-Sandoval, C. Vázquez-López, J. L. Jimenez Perez, and T. L. Ferrell, "The use of the surface plasmons resonance sensor in the study of the influence of "allotropic" cells on water," **Sensors and Actuators B 99, 149-155 (2004).**

2003

- **A. Passian**, P. G. Evans, V. K. Varma, T. L. Ferrell, and T. Thundat, "Piezoresistive detection of acoustic waves," **Rev. Sci. Instrum. 74 (2), 1031-1035 (2003).**
- **A. Passian**, G. Muralidharan, A. Mehta, H. Simpson, T. L. Ferrell, and T. Thundat, "Manipulation of microcantilever oscillations," **Ultramicroscopy 97 (1-4), 391-399 (2003).**
- **A. Passian**, R. J. Warmack, A. Wig, R. H. Farahi, F. Meriaudeau, T. L. Ferrell, and T. Thundat, "Observation of Knudsen effect with microcantilevers," **Ultramicroscopy 97 (1-4), 401-406 (2003).**
- **A. Passian**, R. J. Warmack, T. L. Ferrell, and T. Thundat, "Thermal transpiration at microscale: A Crookes cantilever," **Phys. Rev. Lett. 90 (12), 124503 (2003).**

2002

- **A. Passian**, A. Wig, F. Meriaudeau, T. Thundat and T. L. Ferrell, "Potential distribution and field intensity for a hyperboloidal probe in a uniform field," **J. Vac. Sci. Technol B 20 (1), 76-80 (2002).**
- **A. Passian**, G. Muralidharan, S. Kouchekian, A. Mehta, S. Cherian, T. L. Ferrell, and T. Thundat, "Dynamics of self-driven microcantilevers," **J. Appl. Phys. 91 (7), 4693-4700 (2002); Virtual Journal of Nanoscale Science & Technology 5 (14), (2002).**
- A. Mehta, G. Muralidharan, **A. Passian**, S. Cherian, T. L. Ferrell and T. Thundat, "A self-locking technique with fast response and high sensitivity for micro-cantilever based sensing of analytes," **Mat. Res. Soc. Symp. Proc. 723, O6.7.1-O6.7.6 (2002).**
- **A. Passian**, A. Wig, F. Meriaudeau, T. L. Ferrell, and T. Thundat, "Knudsen forces on microcantilevers," **J. Appl. Phys. 92 (10), 6326-6333 (2002).**

2001

- F. Meriaudeau, A. Wig, **A. Passian**, J-P. Lauret, T. L. Ferrell, "Multiple gold island layers on a fiber core: a promising sensing device," **Opt. Eng. 40 (5), 658-660 (2001).**
- F. Meriaudeau, T. L. Ferrell, E. T. Arakawa, A. Wig, **A. Passian**, T. Thundat, W. J. Shen, S. Patel, F. B. Kraemer, "Study of different hormone-sensitive Lipase

concentrations using a surface plasmon resonance sensor," **Sensors and Actuators B 73, 192-198 (2001).**

- T. L. Ferrell, C. L. Britton, W. L. Bryan, L. G. Clonts, M. S. Emery, M. N. Ericson, F. Meriaudeau, G. W. Morrison, **A. Passian**, S. F. Smith, T. D. Threatt, G. W. Turner, and A. L. Wintenberg, "Telesensor integrated circuits," **World J. Surgery, DOI: 10.1007/s00268-001-0126-0, Société Internationale de Chirurgie, "Information Age Technologies for the Surgeon," (2001).**
- **A. Passian**, A. Wig, F. Meriaudeau, M. Buncick, T. Thundat and T. L. Ferrell, "Electrostatic force density for a scanned probe above a charged surface," **J. Appl. Phys. 90 (2), 1011-1016 (2001).**

2000

- A. Wig, F. Meriaudeau, **A. Passian**, J-P. Goudonnet, and T. L. Ferrell, "Spectroscopy with the Photon Scanning Tunneling Microscope," **Microscopy Today 00 (3) (2000).**
- F. Meriaudeau, A. Wig, **A. Passian**, T. R. Downey, M. Buncick, and T. L. Ferrell, "Gold island fiber optic sensor for refractive indexes sensing," **Sensors and Actuators B 69 (1-2), 51-57 (2000).**

1999

- F. Meriaudeau, T. R. Downey, **A. Passian**, A. Wig, M. Buncick and T. L. Ferrell, "Fiber optic sensor based on gold island plasmon resonance," **Sensors and Actuators B 54 (1-2), 106-117 (1999).**
- T. R. Downey, F. Meriaudeau, **A. Passian**, A. Wig, T. L. Ferrell, "Guided propagating in a step index, multi-mode fiber: effects of index difference variation on allowable TM propagation constants," **Optics and Laser Technology 31 (4), 273-277 (1999).**
- T. L. Ferrell, F. Meriaudeau, **A. Passian**, J-P. Goudonnet, and A. Wig, "Imaging with the Photon Scanning Tunneling Microscope," **Microscopy Today 99 (3), (1999).**

1998

- F. Meriaudeau, T. R. Downey, **A. Passian**, A. Wig, and T. L. Ferrell, "Environmental effects on surface plasmon spectra in gold island films potential for sensing applications," **Applied Optics 37 (34), 8030-8037 (1998).**
- F. Meriaudeau, T. R. Downey, **A. Passian**, P.I. Oden, A. Wig, P. B. Crilly and T. L. Ferrell, "Thin metal island plasmon sensor," **SPIE 3491, 328-333 (1998).**
- J. C. De Priest, F. Meriaudeau, P. I. Oden, T. R. Downey, **A. Passian**, A. Wig and T. L. Ferrell, "Chemically sensitive surface plasmon devices employing a self-assembled composite monolayer film," **SPIE 3491, 772-776 (1998).**
- F. Meriaudeau, T. R. Downey, **A. Passian**, A. Wig, S. Mangeant, P. B. Crilly, T. L. Ferrell, "Development of a fiber optics sensor based on gold island plasmon resonance," **SPIE 3491, 1179-1184 (1998).**
- T. L. Ferrell, P. B. Crilly, S. F. Smith, A. L. Wintenberg, C. L. Britton, G. W. Morrison, N. M. Ericson, D. Hedden, D. Bouldin, **A. Passian**, T. R. Downey, A. Wig and F. Meriaudeau, "Medical telesensors," **SPIE 3253, 193-198 (1998).**

1994

- L. Broström, S. Mannervik, **A. Passian**, and G. Sundström, "Investigation of some transitions and lifetimes in XeII," **Phys. Rev. A 49 (5), 3333-3337 (1994).**

Proceedings, Magazine Articles, Presentation, and Invited Talks

2021

- J. Dawson, M. Iannacone, S. Yoginath, V. Tansakul, R. Jordan, **A. Passian**, J. Asiamah, M. Nance Ericson, G. Long, "Control-Theory-Informed Feature Selection for Detecting Malicious Tampering in Additive Layer Manufacturing Processes," p. 56 in 16th International Conference on Cyber Warfare and Security, by J. Lopez Jr, K. Perumalla, A. Siraj, Feb 25, 2021. Publisher: Academic Conferences Limited, Pages: 564, ISBN: 9781912764884

2020

- S. Keramati, **A. Passian**, V. Khullar, J. Beck, C. Uiterwaal, H. Batelaan, "Flexible bimodal photoemission electron source based on Au-coated fiber optic nanotips, APS March Meeting 2020, Denver, Colorado, USA, March 2020.
- A. Normand, A. M. Charrier, R. H. Farahi, B. Davison, **A. Passian** and A. L. Lereu, "Wood morphogenesis by correlative measurements at the nano-scale," Exploring Lignocellulosic Biomass: challenges and opportunities for bioeconomy -ELB 2020, Sponsor: CNRS, INRAE, Univ de Reims, AgroParisTEch, Centrale supélec, IAR, FARE, Reims, France, June 2020.
- A. Normand, A. M. Charrier, R. H. Farahi, **A. Passian** and A. L. Lereu, "Investigate wood morphogenesis using correlative measurements at the nanoscale," European Biomass Conference and Exhibition, EUBCE 2020, Sponsor: European Commission and others, Marseilles, France, April 2020

2019

- A. Lereu, D. Niu, M. Zerrad, V. Aubry, F. Lemarchand, J. Antonio Zapien, **A. Passian**, and C. Amra, "Resonant all-dielectric planar structures for sensing applications," Proc. SPIE 11081, Active Photonic Platforms XI, 1108126, Sponsor: SPIE, San Diego, California, USA, Sep. 2019.
- D. Niu, M. Zerrad, A. Lereu, V. Aubry, F. Lemarchand, **A. Passian**, J. Antonio Zapien, and C. Amra, "Optimized all-dielectric interference coatings for giant field enhancement in sensing applications," Optical Interference Coatings Conference (OIC), Sponsor: OSA, Santa Ana Pueblo, Mexico, USA, June 2019.

2018

- **A. Passian,** "Opto-nanomechanical material characterization and applications" Invited presentation at the Nano-Optomechatronics Instruments – TNO, Delft, Netherlands, November 23 – 24, 2018.
- S. Keramati, **A. Passian**, V. Khullar, P. Lougovski, H. Batelaan, "Low power laser-driven electron source based on plasmon enhanced metalized optical fiber tips," APS, 49th Annual DAMOP Meeting, Ft. Lauderdale, FL, May 28 - June 1, 2018.
- B. J. Lawrie, M. A. Feldman, **A. Passian**, P. G. Evans, M. F. Chisholm, J. A. Hachtel, R. F. Haglund, and E. F. Dumitrescu, "Plasmon-Mediated Entanglement Dynamics," CLEO: QELS_Fundamental Science 2018, San Jose, California United States, 13–18 May 2018, ISBN: 978-1-943580-42-2
- M. Zerrad, F. Lemarchand, A. Lereu, **A. Passian**, J. A. Zapiens, M. Lequime, C. Amra, "Design of all-dielectric planar structures for optimized giant field enhancement," Advances in Optical Thin Films VI, SPIE Optical Systems Design, Frankfurt, Germany, May 14-17, 2018.
- A. Normand, A. Charrier, R. Farahi, B. Davison, A. Passian, A. Lereu, Nanométrologie des parois cellulaires végétales par microscopies à force atomique," 7ième journées du GDR bois, Cluny France November 20-22nd, 2018
- A. Normand, A. Charrier, R. Farahi, B. Davison, A. Passian, A. Lereu, "Wood morphogenesis under abiotic stress at the nanoscale," 7ième journées du GDR bois, Cluny France November 20-22nd, 2018
- A. Lereu, A. M. Charrier, R. Farahi, B. Davison, **A. Passian**, " Inside nanomechanical properties of Populus plant cell walls, " 10ième Journées scientifiques de Porquerolles, C'Nano, Porquerolles, France, September 10-12th, 2018 (talk)

- A. L. Lereu, A. Charrier, R. H. Farahi, B. H. Davison, **A. Passian**, "Nanometrology of Populus plant cell walls," EUBCE 2018 - 26th European biomass conference and exhibition, Copenhagen, Denmark, May 14-18, 2018.
- A. L. Lereu, A. Charrier, R. H. Farahi, B. H. Davison, **A. Passian**, "Inside nanomechanical properties of Populus plant cell walls," International Conference on Plant and Molecular Biology (PMB 2018), Paris, France, February 22-24, 2018.

2017

- **A. Passian,** "Radiometric force measurements with MEMS" Invited presentation at the University of Alberta, Edmonton, Canada, June 2017.

2016

- V. Zaharov, A. Lambertt, and **A. Passian**, "Wireless Sensor Network Microcantilever Data Processing using Principal Component and Correlation Analysis," In Proceedings of the 13th International Joint Conference on e-Business and Telecommunications (ICETE 2016) - Volume 6: WINSYS, pages 97-105 ISBN: 978-989-758-196-0 (DOI: 10.5220/0005933200970105).
- **A. Passian**, "Nanomechanical spectroscopy and microscopy," Invited oral presentation at CNS-DOE, Oak Ridge, November 2, 2016.
- **A. Passian**, "Nanometrology with mechanical and optical probes," Invited talk, July 12, Université Paris – Sud 91405 ORSAY Cedex, France, (2016).
- **A. Passian**, R. H. Farahi, and B. H. Davison, "Optonanomechanical Spectroscopic Imaging," G.I.T. Verlag, Imaging & Microscopy, Vol.18, Issue 1, Pages: 46-47, March 2016.

2015

- **A. Passian,** R. H. Farahi, and B. H. Davison, "Exploring the nano-world of plant cells with hybrid photonic-mechanical forces," infocus Magazine, The Proceedings of the Royal Microscopical Society, Issue 40, Pages: 4-9, December 2015.

2014

- **A. Passian**, "Multifrequency nanomechanical and nanooptical imaging," Invited talk, 7th C'Nano PACA Scientific Days Conference, C'Nano PACA, June 23-25 2014, Porquerolles Island, France.
- **A. Passian**, "Multifrequency nanomechanical sensing and imaging," Invited talk, July 9, 2014, Institut Fresnel, Marseilles, France.
- **A. Passian**, Physical Sciences Oncology Centers Data Coordinating Center, National Cancer Institute Physical Sciences Oncology Centers annual network meeting, Bethesda, Maryland April 2014.
- **A. Passian**, Biomedical Science and Engineering Conference, Oak Ridge, Tennessee, May 6-8, 2014.

2013

- **A. Passian**, Physical Sciences Oncology Centers Data Coordinating Center, National Cancer Institute Physical Sciences Oncology Centers annual network meeting, Phoenix, Arizona, April 2013.
- **A. Passian,** "Thermal modulation in plasmonic nanoparticles" Invited presentation at the University of Alberta, Edmonton, Canada, February 2013.
- **A. Passian,** "Data analysis of multi-laser standoff spectral identification of chemical and biological compounds," Speaker Invitation, SPIE on Defense, Security, and Sensing, 29 April - 3 May Baltimore, Maryland, 2013.

2012

- **A. Passian**, Physical Sciences Oncology Centers Data Coordinating Center, National Cancer Institute Physical Sciences Oncology Centers annual network meeting, Tampa, Fl, March 2012.

- **A. Passian**, "Thermoplasmonic materials in biomedical applications," Speaker Invitation, EMRS Fall Meeting 2012 – Symposium D, Novel Materials in Biomedical Applications, Warsaw University of Technology – POLAND, 17-21 September 2012.
- **A. Passian**, "Surface modes of nanostructures and probes and their applications in the sub-micron realm," Invited seminar presentation, Department of Chemical and Biomolecular Engineering, UTK, Knoxville Tennessee, April 2012.
- **A. Passian,** "Vis-IR absorption spectroscopy with multilayer microcantilevers", Speaker Invitation, 9th International Workshop on Nanomechanical Sensing, Bombay Mumbai, India, June 6th to June 8th 2012.
- **A. Passian**, "How can physical sciences help cancer research? Invited seminar presentation, Department of Material Science and Engineering, UTK, Knoxville Tennessee, April 2012.
- L. Tetard, **A. Passian**, R. Farahi. Surface and subsurface physical and chemical characterization of materials at the nanoscale. Nature Winter Symposium: Nanotechnology in Biomedicine, Miami, FL, February 2012.

2011

- **A. Passian,** "Thermoplasmonics: From Basics to Applications," Invited lecture at the Summer School on Plasmonics 2: Porquerolles Island, Côte d'Azur, France, October 3-7, 2011.
- **A. Passian,** "Mode Synthesizing Atomic Force Microscopy of Intracellular nanoparticles," Invited presentation at the Workshop on Understanding the Organization of the Intracellular Region, The University of Memphis, Memphis, Tennessee, June 23-24, 2011.
- **A. Passian,** R. H. Farahi, L. Tetard, A. L. Lereu, S. Gleason, "Nanoplasmonics in energy and biomedical research, "Future of Instrumentation International Workshop (FIIW), 2011 pp.168,171, 7-8 Nov. 2011.
- **A. Passian,** "Mechanical and Optical Probe-based Imaging and Sensing: A Bridge to the Nanoworld," Oak Ridge Institute for Continued Learning (ORICL), Roane State Community College, Oak Ridge, Tennessee, February 16, 2011.
- L. Tetard, **A. Passian**, R. Farahi, B. Davison, T. Thundat. Surface and subsurface physical and chemical characterization of materials at the nanoscale. MRS meeting, Boston, MA, December 2011.

2010

- S. Eslami, N. Jalili, **A. Passian**, L. Tetard, T. Thundat, "Nonlinear Interaction Force Analysis of Microcantilevers Utilized in Atomic Force Microscopy," Proceedings Of The Asme Dynamic Systems And Control Conference, PTS A AND B, 781-788, 2010.
- A. L. Lereu, Ph. Dumas, M. F. Garcia-Parajo, **A. Passian**, R. H. Farahi, L. Tétard, N. F. van Hulst, "Evolution of Near Field Optical Microscopy," Future of Instrumentation International Workshop Instruments, Sensors and Measurements for a Sustainable Future, Oak Ridge National Laboratory, Oak Ridge, Tennessee, November 8-10, 2010.
- **A. Passian,** L. Tetard, R. H. Farahi, B. H. Davison, A. L. Lereu, T. Thundat, S. Gleason, K. Tobin, "Trends in High Spatial High Spectral Resolution Material Characterization," Future of Instrumentation International Workshop Instruments, Sensors and Measurements for a Sustainable Future, Oak Ridge National Laboratory, Oak Ridge, Tennessee, November 8-10, 2010.
- **A. Passian,** "Surface Modes and Probes in nanoscale characterization" Invited presentation, Institut Fresnel UMR 6133 - Université Aix-Marseille, Av. Escadrille Normandie 13397 MARSEILLE Cedex 20, France, 2010.
- **A. Passian,** "Mechanical and Optical Probes in Imaging and Sensing: A Bridge to the Nanoworld" Invited presentation at the Georgia BioBusiness Center symposium, University of Georgia, March 12, 2010.

- **A. Passian,** "Surface modes of nanostructures and probes and their applications in the submicron realm," Invited presentation at Birk Nanotechnology Center, Purdue University, March 26, 2010.
- L. Tetard, **A. Passian**, T. Thundat, "Underlying physical principles of subsurface force microscopy," Meeting of The American Physical Society, Portland, March 10, 2010.
- L. Tetard, **A. Passian**, R. H. Farahi, and T. Thundat, "Spectroscopy with microcatilevers," 7th International Workshop on Nanomechanical Cantilever Sensors, Banf, Canada, May 26-28, 2010.
- D. Brissinger, A. L. Lereu, L. Salomon, B. Cluzel, T. Charvolin, C. Dumas, **A. Passian**, and F. de Fornel, "A study of the angular distribution of the surface plasmon excitation induced by a metal/glass discontinuity," The 12th International Scanning Probe Microscopy Conference Sapporo, Japan, May 10-12, 2010.
- R. H. Farahi, **A. Passian**, A. L. Lereu, L. Tetard, T. L. Ferrell, T. Thundat, Nanoparticle thermoplasmonic modulation," The 12th International Scanning Probe Microscopy Conference Sapporo, Japan, May 10-12, 2010.
- A. L. Lereu, **A. Passian**, R. H. Farahi, Ph. Dumas, L. Tetard, and T. Thundat, "Nearfield excitation and polarization dependence of single nanorods," The 12th International Scanning Probe Microscopy Conference Sapporo, Japan, May 10-12, 2010.
- L. Tetard, **A. Passian**, R. H. Farahi, A. Lereu, T. Thundat, "Fourier transform infrared spectroscopy using mechanical oscillators," The 12th International Scanning Probe Microscopy Conference Sapporo, Japan, May 10-12, 2010.
- L. Tetard, **A. Passian**, R. H. Farahi, A. Lereu, T. Thundat, "Mode synthesizing atomic force microscopy of plant cells," The 12th International Scanning Probe Microscopy Conference Sapporo, Japan, May 10-12, 2010.

2009

- S. Eslami, N. Jalili, **A. Passian**, L. Tetard and T. Thundat, "Nonlinear interaction force analysis of microcantilevers utilized in atomic force microscopy," The 2nd Annual Dynamic Systems and Control Conference, October 12-14, 2009, Hollywood, CA, USA, ASME Dynamic Systems and Control.
- **A. Passian**, L. Tetard, and T. Thundat, "On the mechanism of subsurface force microscopy," Invited presentation at the 2nd Multifrequency AFM Conference, Madrid, Spain, June 15-16th, 2009.
- E. Lesniewska, **A. Passian**, T. Tetard, T. Thundat, "Investigation of living cells by near-field ultrasound holography," presented at the 11th International Scanning Probe Microscopy Conference (ISPM), Madrid, Spain, June 17-19th, 2009.
- L. Tetard, **A. Passian**, R. Fairbank, R. H. Farahi, and T. Thundat, "Characterization of biomass at the nanoscale," presented at the 11th International Scanning Probe Microscopy Conference (ISPM), Madrid, Spain, June 17-19th, 2009.
- L. Tetard, **A. Passian**, R. H. Farahi, and T. Thundat, "Scanning probe microscopy of nanoparticles in biological cells," presented at the 11th International Scanning Probe Microscopy Conference (ISPM), Madrid, Spain, June 17-19th, 2009.
- L. Lereu, **A. Passian**, R. H. Farahi, and T. Thundat "Plasmon-induced thermal modulation in thin films" NANOMETA 2009, Seefeld, Autriche, January 5-8, 2009.

2008

- R. H. Farahi, **A. Passian**, A. L. Lereu, T. Thundat, "Nanoparticle thermoplasmonic modulation," AVS 55th International Symposium, Boston, Massachusetts, October 2008.
- R. Desikan, Rangaprasad D., **A. Passian**, R. H. Datar, T. Thundat, "Effect of Fluid Flow on the Sensitivity of Microcantilever Sensors" AVS 55th International Symposium, Boston, Massachusetts, October 2008.
- R. H. Farahi, **A. Passian**, A. L. Lereu, T. Thundat, "Nanoparticle thermoplasmonic modulation," AVS 55th International Symposium, Boston, Massachusetts, October 2008.

- **A. Passian**, A. L. Lereu, T. Thundat, "Geometric optimization of light-actuated radiometric microcantilevers" International Workshop on Nanomechanical Cantilever Sensors, Mainz, Germany, May 19-21, 2008.
- E. Finot, A. Krause, V. Rouger, C. Finot, **A. Passian**, M.-H Nadal, T. Thundat, "The surface stress as a link between the bending and the frequency response of microcantilevers," International Workshop on Nanomechanical Cantilever Sensors, Mainz, Germany, May 19-21, 2008.

2007

- R. Datar, **A. Passian**, R. Desikan, and T. Thundat, "Microcantilever biosensors," The 6th Annual IEEE Conference on Sensors, IEEE SENSORS, October 28 - 31, 2007.
- **A. Passian**, A. L. Lereu, R. H. Farahi, N. F. van Hulst, T. Thundat, "Thermoplasmonic Processes in Continuous and Nanostructured Metallic Thin Films," AVS 54th International Symposium & Exhibition, Seattle, Washington, October 14-19, 2007.
- **A. Passian**, T. Thundat, G. M. Brown, "Receptor-free nanomechanical sensing," Novel Sensors for Use in Radiological and Harsh Environments, Analytical Chemistry in Nuclear Technology, 234th ACS National Meeting, Boston, MA, August 19-23, 2007.
- R. M. Lynch, B. H. Voy, D. F. Glass, S. Mahurin, B. Zhao, L. Tetard, **A. Passian**, K. T. Venmar, T. Thundat, and M.-D. Cheng, "In-Vivo Exposure Characterization and Visualization of SWNH Aggregates," the 3rd International Symposium on "Nanotechnology, Occupational and Environmental Health," Taipei, Taiwan, Aug. 29-Sept. 1, 2007.
- A. L. Lereu, P. Ghenuche, G. Sanchez-Mosteiro, **A. Passian**, J. P. Hoogenboom, R. Quidant, and N. F. van Hulst, "Probing local field at individual metallic antennas by near-field microscopy and single particle luminescence," International Conference on Nano Science and Technology, Stockholm, Sweden, July 02-06, 2007.
- A. L. Lereu, **A. Passian**, R. H. Farahi, T. G. Thundat, and N. F. van Hulst, "Optical antennas and near field," Colloquium presented at the Oak Ridge National laboratory, Oak Ridge Tennessee, USA, January 18, 2007.

2006

- A. L. Lereu, **A. Passian**, R. H. Farahi, S. Zahrai, and T. Thundat, "Plasmonic Marangoni manipulations at the microscale," The European Optical Society Annual Meeting (TOM 3: Nanophotonics, Metamaterials and Optical Microcavities), Paris, France, October 16-19, 2006.
- **A. Passian**, P. G. Evans, and T. L. Ferrell, "Nanoparticle growth and spectroscopy on roughened surfaces" presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Montpellier, France, June 3-6, 2006.
- **A. Passian**, D. Yi, and T. Thundat, "Dynamics of microsensors," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Montpellier, France, June 3-6, 2006.
- A. L. Lereu, **A. Passian**, J. P. Goudonnet, and N. F. van Hulst, "Surface Plasmons Assisted Thermal Couplings," The European Optical Society: EOS Topical Meeting on Molecular Plasmonic Devices, Engelberg, Switzerland, April 27-29, 2006.
- A. L. Lereu, **A. Passian**, S. Zahrai, and N. F. van Hulst, "Surface Plasmons Based Thermo-optic Couplings," Colloquium presented at the Royal Institute of Technology, Stockholm, Sweden, April 07, 2006.
- A. L. Lereu, **A. Passian**, S. Zahrai, and N. F. van Hulst, "All-optical Modulation Processes Employing Surface Plasmons," Colloquium presented at ABB Sweden, Västerås, Sweden, April 05, 2006.

2005

- **A. Passian**, "Thermal phenomena at small scale: friendly or hostile? Can they be both?" Colloquium presentation Institute de Ciencies Fotoniques, Barcelona, Spain, September 14, 2005.
- **A. Passian,** S. Zahrai, A. L. Lereu, R. H. Farahi, T. L. Ferrell, and T. Thundat,

"Microscale Marangoni actuation via nonradiative surface plasmon decay," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Cancun, Mexico, June 5-8, 2005.

- D. Yi, **A. Passian,** A. L. Lereu, and T. Thundat, "An experimental investigation of analog delay generation for dynamic control of microcantilevers," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Cancun, Mexico, June 5-8, 2005.
- A. L. Lereu**, A. Passian,** S. Zahrai, T. L. Ferrell, and T. Thundat, "All-optical modulation processes in thin metal films using thermo-plasmonics," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Cancun, Mexico, June 5-8, 2005.
- **A. Passian**, "Surface modes and their applications in the submicron realm," Colloquium presentation, University of South Alabama, Mobile, February 24, 2005.
- A. L. Lereu, **A. Passian**, T. Thundat, J. P. Goudonnet, T. L. Ferrell, "Modulation processes employing nonradiative surface plasmon decay," Colloquium presentation, University of Twente, Netherland, April 05, 2005.

2004

- **A. Passian,** A. L. Lereu, S. Zahrai, T. L. Ferrell, and T. Thundat, "Thermal forces at the microscale," presented at the Université de Bourgogne, Dijon, France, September 15, 2004.
- **A. Passian,** A. L. Lereu, S. Zahrai, T. L. Ferrell, and T. Thundat, "An investigation of the microscale radiometric forces," presented at the Royal Institute of Technology, Stockholm, Sweden, September 21, 2004.

2003

- **A. Passian,** A. Wig, A. L. Lereu, F. Meriaudeau, T. Thundat, and T. L. Ferrell, "Plasmon interference," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Oxford, U.K., May 23-26, 2003.
- F. Tian, J. H. Pei, **A. Passian**, G. M. Brown, and T. Thundat, "Detection of Cu^{2+} with electrochemically-controlled microcatilever sensors," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Oxford, U.K., May 23-26, 2003.
- A. Wig, **A. Passian,** E. T. Arakawa, T. L. Ferrell, and T. Thundat, "Interference effects in optically activated microcantilevers," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Oxford, U.K., May 23-26, 2003.
- **A. Passian,** A. L. Lereu, T. L. Ferrell, and T. Thundat, "Near field surface plasmons interference," presented at the Université de Bourgogne, Dijon, France, September 12, 2003.
- **A. Passian,** A. L. Lereu, T. L. Ferrell, and T. Thundat, "An investigation of Knudsen effect with microcantilever," presented at the International micro and nanotechnology meeting (Rencontres internationales des micro et nanotechnologies, MINATEC 2003), Grenoble (Alpes congrès), France, September 22-26, 2003.

2002

- **A. Passian,** R. J. Warmack, A. Wig, F. Meriaudeau, T. L. Ferrell, and T. Thundat, "Observation of Knudsen effect with microcantilevers," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Las Vegas, Nevada, May 28, 2002.
- **A. Passian**, G. Muralidharan, A. Mehta, T. L. Ferrell, and T. Thundat, "Manipulation of microcantilever oscillations," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Las Vegas, Nevada, May 26-29, 2002.
- A. Wig, **A. Passian,** T. L. Ferrell, and T. Thundat, "Optical activation of microcantilevers with applications for coatingless chemical detection," presented at the Scanning Probe Microscopy Sensors and Nanostructures Conference, Las Vegas, Nevada, May 26-29, 2002.

- A. Mehta, G. Muralidharan, **A. Passian**, S. Cherian, T. L. Ferrell and T. Thundat, "A self-locking technique with fast response and high sensitivity for micro-cantilever based sensing of analytes," presented at the Material Research Society spring meeting, March 2002.
- N. M. Aguirre, **A. Passian**, A. Wig, T. L. Ferrell, "Measurements of the dielectric function of allotropic water using absorption spectra of gold (Au) islands at the surface plasmon resonance," CSI 2002 9th International Meeting on Chemical Sensors Boston, USA, July 7-10, 2002.
- N. M. Aguirre, **A. Passian**, A. Wig, L. Martinez Perez, T. L. Ferrell, "Room temperature gas response of evaporated $Sn0_2$ thin films using total internal reflection," CSI 2002 9th International Meeting on Chemical Sensors Boston, USA, July 7-10, 2002.

2000

- F. Meriaudeau, A. Wig, **A. Passian**, T. R. Downey, M. Buncick, and T. L. Ferrell, "Gold island fiber optic sensor," (tenative number 3860-27) The American Diabetes Association, 60th Scientific Sessions, 2000.

1999

- T. L. Ferrell, C. L. Britton, W. L. Bryan, L. G. Clonts, M. S. Emery, N. M. Ericson, F. Meriaudeau, G. W. Morrison, **A. Passian**, S. F. Smith, T. D. Threatt, G. W. Turner, and, A. L. Wintenberg, "Telesensors integrated circuits," Proc.Nat. Inst. Health Conf. On Microdevices in Medicine (Cambridge Healthcare Institute, Newton Upper Falls, MA) (San Jose, CA), April 19-21, 1999.
- F. Meriaudeau, A. Wig, **A. Passian**, T. R. Downey, M. Buncick, and T. L. Ferrell, "Gold island fiber optic sensor," SPIE International Symposium on Environmental and Industrial Sensing, Vol. 3860, p214-23, September 1999.

1998

- T. R. Downey, F. Meriaudeau, **A. Passian**, A. Wig, P. B. Crilly and T. L. Ferrell, "Development of a fiber optic sensor based on gold island surface plasmon resonance," Oral presentation at IEEE/SPIE/OSA 1998 International Conference on Applications of Photonic Technology (ICAPT'98), Ottawa, Canada (ICAPT98T219); Proc. SPIE. Vol. 3491, July 30, 1998.
- F. Meriaudeau, T. R. Downey, **A. Passian**, P.I. Oden, A. Wig, P. B. Crilly and T. L. Ferrell, "Thin metal island plasmon sensor," Oral presentation at ICAPT'98, (ICAPT98T206); Proc. SPIE Vol. 3491, July 29, 1998.
- J. C. De Priest, F. Meriaudeau, P. I. Oden, T. R. Downey, **A. Passian**, A. Wig and T. L. Ferrell, "Chemically sensitive surface plasmon devices employing a self-assembled composite monolayer film," Oral presentation at ICAPT'98, (ICAPT98T217); Proc. SPIE Vol. 3491, July 28, 1998.
- T. L. Ferrell, P. B. Crilly, S. F. Smith, A. L. Wintenberg, C. L. Britton, G. W. Morrison, N. M. Ericson, D. Hedden, D. Bouldin, **A. Passian**, T. R. Downey, A. Wig and F. Meriaudeau, "Medical telesensors," Oral presentation at SPIE Photonics West, BiOS'98, Proc. SPIE Vol. 3253, January 1998.
- F. Meriaudeau, T. R. Downey, **A. Passian**, A. Wig, S. Mangeant, P. B. Crilly, T. L. Ferrell, "Development of a fiber optics sensor based on gold island plasmon resonance," #ICAPT98T219 (1998).

Selected Patents, Inventions, Technology Transfers (~ 30 Invention disclosures)

1. **A. Passian**, T. Thundat, R. H. Farahi, "Microscale fluid transport using optically controlled marangoni effects," US 2009/0020426 A1
2. **A. Passian**, L. Tetard, T. Thundat, "Mode synthesizing atomic force microscopy (MSAFM)."
3. **A. Passian**, L. Tetard, T. Thundat, "Mode synthesizing sensing (MSS)."

4. **A. Passian**, L. Tetard, T. Thundat, B. Davison, "Scanning nearfield acoustic photothermal spectroscopy (SNAPS)," **patent pending**.
5. T. L. Ferrell, Gong Gu, V. Khullar, and **Ali Pasian**, "Surface plasmon scanning-tunneling chemical mapping (SPSTM) system," U.S. Patent Appl. No. 15/975,228.
6. **A. Passian**, Infrared Remote Spectroscopy with Interferometric Multilaser Pump-Probe Excitation-Detection," **patent pending**. (Technology transfer via licensing to startup)
7. J. Dawson, S. Prowell, and **A. Passian**, "Noise-Free Data Retrieval and Aggregation of Periodic OS Function Invocation Power Consumption for Rootkit Detection," **patent filed.**

Selected projects and contracts

- ORNL-DOE LDRD, 2019

Multi-laser interferometric standoff sensor for the detection of illicit drugs
Objective: Development of an eye-safe, fast, and portable sensor for the trace amount detection of drugs and contraband
Role: Principal Investigator

- ORNL-DOE LDRD, 2017-2018

A novel plasmon-assisted few-to-single electron nanotip source for nanoscale dynamic imaging and magnetometry
Objective: plasmonic electron field emission is explored toward the development of a nano-optic electron gun for electron point projection microscopy (ePPM) and electron interferometry
Role: Principal Investigator

- ORNL-DOE LDRD 2016-2018

Dissipation Driven Quantum State Engineering On-Chip
Objective: exploiting the coherence and field enhancement of plasmonic nanoparticles near quantum emitters to generate entangled states
Role: Co-Investigator

- NIH/LEIDOS contract, 2015-2016

Physical Sciences Oncology Data Coordinating Center
The goal of this contract was to continue to develop an infrastructure to collect, annotate, archive, disseminate and coordinate heterogeneous data from numerous physical measurements conducted in cancer research for the NIH.
Notable data types: Scanning probe microscopy data including SEM, AFM, and Fluorescence super resolutions microscopy (TIRF etc).
Role: Principal Investigator

- BioEnergy Science Center (BESC), Characterization instrumentation 2010-2017

Development of the Hybrid-photonic nanomechanical force microscopy (HPFM) for simultaneous subsurface high-resolution non-destructive imaging and chemical mapping.
Role: Principal Investigator

- ORNL DOE

Data Acquisition and Software Interface Development for Mode synthesizing atomic force microscopy and sensing
The objective of this project was to streamline the frequency domain operation of the subsurface capabilities of the MSAFM.
Role: Principal Investigator

- BioEnergy Science Center (BESC), Characterization instrumentation 2009-2017

Development of the Mode Synthesizing atomic force microscopy (MSAFM) for subsurface high- resolution non-destructive imaging.
Role: Principal Investigator

- BioEnergy Science Center (BESC), 2010-2017

Nanoscale molecular characterization and Imaging
The purpose of this project is to develop AFM-based measurement technologies for molecular level biomass characterization. The goal of this study is to conduct spectroscopic studies on Populus samples in order to analyze lignin, cellulose and hemicellulose content in an effort to find solutions for biomass recalcitrance.
Role: Principal Investigator

- NIH/LEIDOS contract, 2012-2015

Physical Sciences Oncology Data Coordinating Center
The purpose of this project was to define, build and host a pilot informatics infrastructure data center to support the twelve NIH Physical Sciences-Oncology Centers (PS-OC). The goal of this 3-year contract is to design and develop an infrastructure to collect, annotate, archive, disseminate and coordinate heterogeneous data from numerous physical measurements conducted in cancer research for the NIH. Work included novel metadata scheme to annotate data covering many disciplines in the physical sciences (physics, chemistry, biology, mathematics, computational modeling, engineering, etc.) and medicine.
Role: Principal Investigator

- DHS SERRI

Objective: development of an integrated sensor system for real-time monitoring of metabolites of organophosphorus chemical warfare agents, pesticides, and e. coli in food and water.
The sensors include both MEMS and optical types with the final objective of achieving molecular recognition.
Role: Principal Investigator

- DOE LDRD

Objective: phase change material detectors for single-photon detection in the UV-Vis region
Role: Co-Investigator

- DARPA contract

Venous Imaging
Objective: demonstrate a semi-robotic infra-red (IR) imaging device to elucidate blood vessels on the forearm to aid medical practitioners in inserting catheters on the battlefield.
Role: Co-Investigator

- ORNL-DOE LDRD

An All-Optical Plasmonic Pump for Integrated Applications
Objective: obtaining proof-of-principle of an all-optical nanoscale pump for use with miniaturized sensors and devices for developing applications in lab-on-chip.
Role: Principal Investigator

- ORNL-DOE LDRD

A Nonlinear Plasmonic Nano-Circuit for Data Communications
Objective: demonstration of a light-by-light modulation with a thermo-plasmonic nanocircuit toward achieving fast communications, utilizing the nonlinear dependence of plasmonic systems.
Role: Principal Investigator

- ORNL-DOE LDRD

Chemical Identification of Material Using Remote and Standoff Detection
Objective: development of a novel spectroscopic photothermal detection technique for chemical identification of adsorbed chemicals on remote surfaces using quantum cascade lasers (QCL).
Role: Principal Investigator

- Colgate-Palmolive 2009

Microcantilever-based sulfur compound detection in breath
Objective: development of sensors capable of trace detection of hydrogen sulfide for the physiological detection of malignancies in breath
Role: Co-Investigator

- ORNL-DOE LDRD

A new form of photon scanning tunneling microscopy (PSTM)
Objective: development of a new plasmon enhanced PSTM where photon tunneling and plasmon coupling drives the signal for image formation.
Role: Principal Investigator

Teaching/Research Advising and Mentoring Experience

1996 – present Supervising/mentoring students from the following selected institutions:

UTK, Department of Physics, Université de Bourgogne, Dijon, France, Département de Physique, Ecole Supérieure d' optique, Orsay cedex, France, Denison University, Cornell University, Eastern Illinoise University, Virginia Polytechnic Institute and State University, Tennessee Technological University, Polytechnic University of Puerto Rico, San Juan, Puerto Rico, Alcorn State University, Maryville College, Purdue University, Northern Arizona University, University of New Mexico, Florida State University, University of Southern Florida

1996 – 1999 Teaching Assistant, University of Tennessee (UTK), Knoxville

Selected advised/mentored students and faculty:

Dissertation:

- **2002 - 2005**
  Aude Lereu, Université de Bourgogne. PhD dissertation topic: Couplages Assistes par Plasmons de Surface
- **2002 - 2007**
  Philip Evans, UTK, Department of Physics. PhD dissertation topic: Surface Plasmon Enhanced Heating of Gold Nanoparticles: A Plasmonic Optical Switch
- **2006 - 2010**
  Laurene Tetard, UTK, Department of Physics. PhD dissertation topic: Surface and Subsurface Physical and Chemical Characterization of Materials at the Nanoscale
- **2011 - 2013**
  Ghaneshwar Gautam, UTK, Department of Physics. PhD dissertation topic: Interferometry in the Nearfield microscopy. Expected graduation 2015.
- **2011 - 2016**
  Marouane Salhi, UTK, Department of Physics. PhD dissertation topic: Plasmon excitation and decay in toroidal spaces. Expected graduation 2016.

Dissertation Advisory Committee Member/co-major professor:

- Maryam Bagherian, Dissertation Topic: "Modeling of quantum plasmonics in nanoparticles" Expected graduation date: 2019, Department of Mathematics, University of South Florida, Tampa, USA
- Kumar Vijay Garapati, Dissertation Topic: "Toroidal and poloidal plasmon eigenmodes and fields" Graduation date: 2017, Department of Mathematics, University of South Florida, Tampa, USA
- Eric Hawk, Dissertation Topic: "Nanoscale material charcterization with scanning probe microscopy" Expected graduation 2018, Department of Chemical and Materials Engineering, The university of Alberta, Edmonton, Canada
- Younes Sina, Dissertation Topic: "The effect of Zr implantation and

transformation in metal oxides," Graduation date: 2014, Department of Material Science and Engineering, UTK, USA

- Muamer Kadic, Dissertation Topic: "Metamaterials for surface plasmons," Graduation date: 2012, Institut Fresnel and Université Aix-Marseille, MARSEILLE, France

Other Contribution to Dissertation

- Sohrab Eslami, Dissertation Topic: "Modeling and boundary force control of microcantilevers utilized in atomic force microscopy for cellular imaging and characterization," Graduation date: 2011, Department of Mechanical and Industrial Engineering, Northeastern University, USA

Mentor:

- **2008 Summer**
  Department of Energy (DOE), Office of Science, Faculty and Student Teams (FaST) Program
  (Institution: Polytechnic University of Puerto Rico, San Juan, PR)
  - Alejandro Suarez (Professor)
    Project: The Measurement of Knudsen Forces on Microcantilevers
  - Marissa Morales (Student)
    Project: Characterization of Platinum Nanoelectrodes with Atomic Force Microscopy and Conductivity Measurements
  - Raquelimar Rodriguez (Student)
    Project: The Measurement of Knudsen Forces on Microcantilevers
  - Jimmy Zahra (Student)
    Project: Detection Of Explosive By Photothermal Deflection Spectroscopy

- **2009 Summer**
  Department of Energy (DOE), Office of Science, Faculty and Student Teams (FaST) Program
  (Institution: Alcorn State University, Mississippi)
  - Yolanda Jones (Professor)
    Project: Multiphysics sensors
  - Shonique Adams (Student)
    Project: Quartz crystal microbalance sensors
  - Anthony McCarthy (Student)
    Project: Quartz crystal microbalance sensors

- **2011 Summer**
  Department of Energy (DOE), Office of Science, Faculty and Student Teams (FaST) Program
  (Institution: Polytechnic University of Puerto Rico, San Juan, PR)
  - Viktor Zaharov (Professor)
    Project: Laser spectroscopy
  - Daniel Webster (Student)
    Project: Compound detection using a Standoff Photothermal Infrared Spectroscopy Technique
  - Julio Irizarry Benejam (Student)
    Project: Open Architecture Reflective Spectroscopy

- **2011 Summer**
  Summer Research Fellowship Program for Outstanding Physics Majors
  (University of Tennessee, Department of Physics, Knoxville, TN)

- Caleb Redding
  Project: Confocal and nearfield spectroscopy with Nearfield Scanning Optical Microscope (NSOM)
- Steven Crawford
  Project: Confocal and nearfield spectroscopy with Nearfield Scanning Optical Microscope (NSOM)
- Lisa Agle
  Project: Broadband photothermal standoff spectroscopy

➢ **2012, 2013, and 2015 Summers**
Department of Energy (DOE), Office of Science, Faculty and Student Teams (FaST) Program
(Institution: Polytechnic University of Puerto Rico, San Juan, PR)
- Viktor Zaharov (Professor)
  Project: Statistical analysis of spectroscopic data

➢ **2016 Summer**
Department of Energy (DOE), Office of Science, Science Undergraduate Laboratory Internships (SULI) Program
(Institution: University of South Florida)
- Edward Mitchell
  Project: Temperature gradient driven fluid flow in confined spaces

➢ **2020 Summer**
Illinois physics REU program (NSF REU, DOD)
(Institution: University of Illinois)
- Benjamin Frey
  Project: Computational studies of Fiber Brag Grating sensors

Other advised/mentored students, and postdocs:

- Serena Pham, Florida State University (2013-2015 Sponsored Project employee: Development of a cyber infrastructure for cancer data)
- Aaron Allen, The University of New Mexico (2014 ORNL Sponsored Internship, Research project: Plasmonics)
- Patrick Snyder, Eastern Illinoise University (2012, and 2013 Science Undergraduate Laboratory Internship, SULI, Research project:
- Benjamin Thiesing, Northern Arizona University (2012 University Sponsored Internship, Research project: High resolution holography)
- Patrick Snyder, Eastern Illinoise University (2012, and 2013 Science Undergraduate Laboratory Internship, SULI, Research project: Nanomechanical frequency mixing and coupling)
- Katherine Nadler, Maryville College (2010 Department of Homeland Security (DHS) Internship, Research project: Detection of vaporized explosive molecules)
- Adam Krause, UTK (2009, Research project: Dynamics of MEMS microoscillators)
- Jeremy Nabeth, Purdue University (2008 University Sponsored Internship, Research project: Knudsen forces at the microscale)
- Rachel Fairbank, Cornell University (2008 Science Undergraduate Laboratory Internship, SULI, Research project: Atomic Force Microscopy)
- Jessica White, University of Tennessee (2007, Research project: Spectroscopy)

- Natasha Strande, Denison University (2007 Science Undergraduate Laboratory Internship, SULI, Research project: Biosensing of DNA hybridization using MEMS microoscillators)
- Hari Krishna, Virginia Polytechnic Institute and State University (2007 Science Undergraduate Laboratory Internship, SULI, Research project: Dynamics of frequency shift Atomic Force Microscopy)
- Dechang Yi, Tennessee Technological University (2007 ORAU Postdoctorate, Research project: Delay stochastic oscillations and coupling in microoscillators)
- Katherine Venmar, Denison University (2006 Science Undergraduate Laboratory Internship, SULI, Research project: Atomic Force Microscopy)
- Vanessa Chauveau, Université de Bourgogne (2006 ORNL Sponsored Internship, Research project: Nearfield Scanning Optical Microscopy)
- Eric Hawk, University of Tennessee, Memphis (2004, Research topic: Delayed self-excitation of micro-oscillators)
- Sarah Armel, ORNL, (2005, Research project: Novel sensors)
- Ramya Desikan, ORNL, (2007, Research project: Biosensing of DNA hybridization using MEMS microoscillators)
- Ivan Rothstein, Virginia Tech, (2005, Research project: Computational physics)

Selected collaborations

- Prof. Thomas Thundat: University of Alberta, Edmonton, Canada
- Dr. E. Le Moal, Université Paris-Sud, Orsay, France
- Prof. Alina Alexeenko: Purdue University, West Lafayette, USA
- Dr. Fabrice Meriaudeau: Université de Bourgogne, 71200 Le Creusot, France
- Prof. Sherwin Kouchekian: University of South Florida, FL, USA
- Prof. Eric Finot: Université de Bourgogne, 21011 Dijon, France
- Dr. Aude Lereu: Institut Fresnel UMR 7249 - Université Aix-Marseille, Marseille Cedex 20, France
- Dr. R. Alaee, Max Planck Institute for the Science of Light, Erlangen, Germany
- Professor H. Batelaan, University of Nebraska, Lincon, Nebraska, USA
- Prof. M. Kadic, CNRS, Institut FEMTO-ST, Besançon Cedex, France
- Dr. C. Amra, Aix Marseille Univ, CNRS, Centrale Marseille, Institut Fresnel, Marseille, France
- Prof. V. Zaharov, Polytechnic University of Puerto Rico, USA
- Dr. M. Yazdanpanah, NaugaNeedles LLC, Louisville, Kentucky, USA
- A. Ragauskas, Georgia Institute of Technology, Atlanta, Georgia, USA
- Dr. Robert A. Gatenby, MD, Moffitt Cancer Center, Tampa, Florida, USA

Software and programming experience

Fortran, Pascal, C, C^{++}, IDL, SIMULA, Labview, MATLAB, MAPLE, COMSOL, FlexPDE, MATHCAD, Igor, Origin, Tex, Latex, Java, Python

Languages

English, Swedish, Persian, French (basic)

Professional Activities, Honors, Awards

- Proposal Review Panel Member:

  National Science Foundation (NSF), National Health Institute (NIH), EU, Partner University Fund (PUF)

Department of Energy (DOE), Laboratory Directed Research and Development (LDRD)

Selected Panels:

- **NSF**, Explosives and Related Threats: Frontiers in Prediction and Detection (EXP) for MPS/BIO/IDP (05/17/2007 – 05/18/2007).
- **NIH/NCI**, Physical Sciences Oncology Centers (U54), RFA-CA-09-009 (06/28/2009 – 06/30/2009).
- **NIH/NIGM**, Biomedical Instrumentation Special Emphasis Panel (SEP) for Instrument Development for Biomedical Applications (R21), RFA-RR-11-005 (02/21/2012 – 02/22/2012).
- **NIH/NIGM**, Biomedical Instrumentation Special Emphasis Panel (SEP) for Instrument Development for Biomedical Applications (R21), RFA-GM-13-010 (03/13/2013).
- **NIH/NIGM**, Biomedical Instrumentation Special Emphasis Panel (SEP) for Instrument Development for Biomedical Applications (R21), RFA-GM-14-014 (03/06/2014).
- **NIH/NCI**, Expert review panel conducted by The National Cancer Institute (NCI) Division of Cancer Biology (DCB) to assess the impact and innovativeness of research funded by NCI's Physical Sciences - Oncology Centers (PS-OC) Program, NCI's Integrative Cancer Biology Program (ICBP), and NCI R01 awards, (2016).
- **DOE/ASCR**, Smart Sensors and Devices for Science, Engineering, and Manufacturing, (01/22/2018 - 01/23/2018).
- **NIH/NIGM**, Biomedical Technology Research Resource Centers (BTTR), (08/15/ 2018).
- **DOE/BER**, FY2019 SBIR/STTR topic 27. Bioimaging Technologies for Biological Systems, Sub-Topic: a. New Instrumentation and Bioimaging Devices for Non-destructive metabolic imaging of plant and Microbial Systems, (2019).

- Selected journal refereeing:

  Nature Nanotechnology, Nature, Scientific Reports, Physical Review Letters, Physical Review A, B, and E, ACS Nano, ACS Photonics, Ultramicroscopy, Sensors and Actuators A and B, J. MEMS, Optics Letters, Optical Engineering, Review of Scientific Instruments, Solid-State Electronics, J. Appl. Phys., and Appl. Phys. Lett., Optics Express, Appl. Opt., Nanotechnology, Nature Communications etc.

- Member of APS; American Physics Society
- Member of Sigma Pi Sigma, National Physics Honor Society, Chapter at the University of Tennessee, Knoxville
- 2007 FLC Southeast Region Awards RePAS: Reverse Photo-Acoustic Spectroscopy
- 2010 R&D 100 award for the development of Mode synthesizing atomic force microscopy
- 2015 Mentor Certificate of Appreciation, Appalachian Regional Commission/ORNL 2015 High School Summer Math-Science-Technology Institute.

- 2021- Present: Editorial Board Member of *Sensors* (ISSN 1424-8220; CODEN: SENSC9).