

Boston Section

Supporting students, working engineers and retirees through professional development, education and resources.

THE Reflector

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Who are IEEE Life Members and How Can you Join Them?

By Lori Jeromin, Boston Section Life Members Chair

IEEE has a wonderful reward for longtime members - membership in the Life Members Affinity Group (LM). This group provides ongoing networking opportunities, seminars, and outreach activities with a wider variety of engineers than we often encounter earlier in our careers.

Membership is automatic for experienced engineers (65+) who have been long-time IEEE members. Of course, there's an equation for determining membership. Life Members are notified when eligible. IEEE annual dues is waived, and many societies waive fees or provide discounts to LM. And, as with most chapters/ affinity groups, there are newsletters, seminars, and other activities.

Life Members are power engineers, computer scientists, engineers familiar with bioengineering, RF hardware, photons, AI, or information theory; so activities are varied and wide ranging. Annual fields trips have ranged from learning about development and evolution of field rations (MREs) and wearables at Natick Army Labs to comparing stained glass techniques at the Worcester Art Museum. Many LMs are still working or continue technical consulting after 'retirement', and some provide mentorship or participate in IEEE member elevation events. This fall, we hope to learn more about local IEEE Milestones (check them out on the Boston Section website), and contribute to planning for upcoming Milestone events.

Boston Section Life Members group holds a number of seminars each year. Topics tend to be general technical topics that appeal to our varied membership as well as spouses, technical neighbors, children, and sometimes even grandchildren. A recent topic was AI for everyday, and was held at a local retirement community. We are eager to co-host meetings with technical chapters, and we cohost events with the NH Life Members. Seminars are open to all. They have proven fruitful to younger engineers interested in new areas and wider networking opportunities. We're eager to hear new topics of interest and seek opportunities for collaboration with other groups.

Boston Life Members welcome participation and ideas from longtime, recent, or future members - It's a great way to continue to broaden your network and knowledge.

Lori Jeromin is the Chair of the IEEE Boston Section Life Members Affinity Group, and serves on the IEEE Boston Section Executive Committee. She is a past Chair of the IEEE Boston Section, and past Chair of the local IEEE Communications Chapter, which won an award for Chapter of the Year under her tenure. Lori has been a member or chair of the technical program committees for a number of related conferences, such as the Military Communications Conference (MILCOM), Globecom, and ICC.

Lori worked as a communications systems engineer and program lead at MIT Lincoln Lab, supporting RF and optical wireless communications standards and development programs. She holds a B.S. in Mathematics from Bucknell University, and an S.M. in Electrical Engineering and Computer Science from Massachusetts Institute of Technology, where she continues to support alumni activities.

If you're interested in working with the IEEE Boston Section Life Members on a presentation or other event, please contact Lori Jeromin at lorilee@ieee.org.

IEEE Life members

IEEE
Advancing Technology for Humanity

IEEE International Conference on AI & Data Analytics (ICAD 2027)

June 2027, Boston, Massachusetts, USA

CALL FOR PAPERS

Submission Deadline: January 15, 2027
Notification of Acceptance: March 12, 2027
Publication-Ready Submission: April 20, 2027

More information and submissions:
IEEE-ICAD.org

ICAD 2027 invites original research papers and posters spanning foundations, emerging frontiers, and applications of Artificial Intelligence (AI)* and Data Analytics. The conference features oral and poster presentations, invited talks, and Best Paper Awards recognizing outstanding research. We welcome submissions on topics including, but not limited to:

Track 1: Foundations of AI, Data Science & Analytics	Track 2: Applied AI & Analytics in Industry and Enterprise
1. Core Machine Learning & Deep Learning Methods 2. Computer Vision & Multimodal Perception 3. Natural Language Processing, Speech, Audio & Voice AI 4. Retrieval-Augmented AI, Knowledge Grounding & Memory 5. Reinforcement Learning, Preference Optimization & Feedback 6. Reasoning Models, Inference-Time Scaling & Test-Time Compute 7. Statistical & Predictive Analytics 8. Recommender Systems & Personalization 9. Data Visualization & Causal Inference 10. Explainable AI (XAI) & Model Interpretability 11. Synthetic Data for Training & Evaluation 12. ML Systems & Infrastructure: Serving & Orchestration 13. Autonomous, Self-Healing Data Pipelines	1. AI in Finance, Business Intelligence & Customer Experience 2. AI in Manufacturing, Supply Chain & Industry 4.0 3. AI for Climate, Environment & Sustainability 4. AI in Medicine, Healthcare & Assistive Technologies 5. AI in Media, Entertainment & Creative Industries 6. AI for Cybersecurity: Vulnerability Discovery, Analysis & Defense 7. AI in Education & Workforce Development 8. AI in Law, Justice, Legal Tech & Government 9. AI in Agriculture & Food Systems 10. AI in Transportation, Mobility & Smart Cities 11. Digital Twins & Simulation 12. AI in Software Engineering, Testing & DevOps
Track 3: Frontiers in AI and Data Analytics	**Track 4: Responsible AI, Safety & Governance**
1. Generative & Multimodal AI, Foundation & World Models 2. Agentic AI Systems, Frameworks, Tools & Protocols 3. AI Alignment, Control & Human Oversight 4. AI Evaluation, Benchmarks & Assurance 5. Robotics, Embodied AI & Vision-Language-Action Models 6. AI for Science & Autonomous Experimentation 7. Human-in-the-Loop AI & Human-AI Collaboration 8. Edge AI & Federated Learning 9. Efficiency & Energy-Aware AI 10. Open-Weight & Accessible AI Models 11. Neuromorphic, Brain-Inspired & Quantum AI/ML	1. AI Governance, Regulation & Policy 2. AI Safety Infrastructure, Sandboxes & Assurance 3. Ethics, Fairness & Bias Mitigation 4. Privacy-Preserving & Trustworthy AI 5. Transparency, Auditing & Risk-Based Compliance 6. AI Security, Adversarial Attacks & Red Teaming 7. AI for Social Impact 8. Green AI & Sustainable AI Development

Submission Guidelines

All submissions must go through the Conference Management Tool. Complete paper and poster specification guidelines are at ieee-icad.org.



Technical Program Co-Chairs:

Cristina Maier, cristina.maier@bc.edu | Surbhi Kanthed, skanthed@redhat.com

Conference Co-Chairs:

Shankar Krishnan, shanky.krish06@gmail.com | Joseph P. Campbell, jpc@ll.mit.edu

* Consistent with IEEE terminology, this Call for Papers uses the broad term Artificial Intelligence (AI), including technologies referred to as Super Intelligence (SI) under U.S. Executive Order 14434 (2026).

Sponsored by IEEE Boston's Computational Intel. Society and AI Local Group

Upcoming Member Event Meetings

October Topic: **Agentic coding and Spec-Driven Development in Practice**
13Oct2026, 6:00-8:00pm, virtual/WebEx



As AI software engineering moves toward context engineering, Spec-Driven Development (SDD) is key for predictable code. This talk explores three open-source SDD frameworks—BMAD, OpenSpec, and SpecKit—analyzing how each structures specs and handles edge cases. We will also examine enriched vs. lean context trade-offs, showing where additional detail prevents hallucinations and where it simply degrades performance.

Register here: https://events.vtools.ieee.org/m/575332

Subhash Kovela

November Topic: **Building a Production-Grade Retrieval Augmented Generation (RAG) Pipeline**
09Nov2026, 6:00-7:30pm, in-person + virtual *(Hands-on Workshop)*



Naive RAG patterns—chunking, embedding, and injecting top matches—frequently fail in real-world scenarios by retrieving irrelevant context or generating unverified assertions. In this hands-on workshop, we move beyond basic implementations to construct a robust, production-ready pipeline. Attendees will learn to design resilient architectures that handle complex, domain-specific documents and deliver reliable, verified outputs.

Register here: https://events.vtools.ieee.org/m/575323

Nutan Sahoo

December Topic: **The Hard Part of Voice AI Is Not the Voice: Engineering Voice Agents That Take Action**
08Dec2026, 6:00-8:00pm, in-person + virtual



Modern voice agents now take autonomous action across enterprise systems. However, real engineering complexity lies in the underlying agentic loop, which must reason, call tools, and act under strict millisecond latency budgets. Drawing on enterprise-scale experience, this session covers agent architecture, latency distribution, key failure modes like barge-in, evaluation strategies, and human handoffs.

Register here: https://events.vtools.ieee.org/m/575329

Shankar Krishnan

1Q2027 Topic: **Requirements Engineering for Autonomous AI Agents**
Date and Time TBD



Standard user stories break down when executed by autonomous agents capable of triggering real-world actions. This session introduces four essential artifacts for agent specifications: autonomy boundaries, tool contracts, escalation paths, and traceability records. Learn how to define testable predicates, elicit requirements, and establish verifiable governance before deployment to ensure safe, accountable runtime execution.

Register here: Coming soon!

Mohan Namasivayam

IEEE Boston Chapter of the Nuclear & Plasma Sciences & Social Implications of Technology - 10:30AM, Tuesday, November 3

Lessons Learned and Open Questions on using GNSS Radio Occultation to Monitor Sporadic-E

Time: 10:30AM, Tuesday, November 3

Location: 885 Centre St. Newton, MA. Building: Kenny Cottle Conference. Room Number: Room 202

Registration: https://events.vtools.ieee.org/m/589215

Speaker: Dan Emmons

While Global Navigation Satellite System (GNSS) radio occultation (RO) has shown promise for global monitoring of ionospheric disturbance such as sporadic-E, the integrated nature of the observations makes extracting physical parameters such as the peak layer density difficult. In this talk, the standard measurement approaches for sporadic-E using ionosondes and GNSS-RO are introduced. Forward modeling of GNSS-RO signals through sporadic-E are discussed to provide physical insight into the observations and unknowns. Finally, GNSS-RO and ionosonde observations are compared and contrasted to discuss lessons learned and open questions on using GNSS-RO to monitor sporadic-E.

Lt Col Daniel J. Emmons is Senior Military Faculty and Associate Professor of Physics at the Air Force Institute of Technology, Wright-Patterson Air Force Base, Ohio. He attended San Diego State University where he received a commission from the Reserve Officer Training Program, Detachment 075. After graduation, he led collateral hazards analysis efforts for the 711th Human Performance Wing at Brooks City Base, Texas before attending the Air Force Institute of Technology (AFIT) for a Master's in Applied Physics with an emphasis in Space Weather. Subsequently, he was assigned to the Space Vehicles Directorate of the Air Force Research Laboratory at Kirtland Air Force Base, New Mexico where he directed ionospheric research in support of the Intelligence Community. Following Kirtland, he attended AFIT for a PhD in Applied Physics with an emphasis in Plasma Physics in support of high energy lasers. In 2017, he was assigned to AFIT as an Assistant Professor of Physics directing the DoD's only space weather graduate program and leading technical efforts in support of DoD challenges. Recently, he was promoted to Associate Professor and selected as a member of AFIT's Senior Military Faculty to provide long-term leadership and mentoring to students and faculty.



IEEE Boston Signal Processing and Education Societies - 11:00AM, Tuesday, November 10 – 5:00PM,

Noise in Imaging: Focus on Correlation and Nonlinearity

Time: 5:00PM, Tuesday, November 10
Location: Boston University, 8 St. Mary's Street, Boston, Massachusetts. Building: ECE Dept. Room Number: Room PHO339
Registration: https://events.vtools.ieee.org/m/581088
Speaker: Prof. Alessandro Foi, IEEE SPS Distinguished Lecturer

Understanding and characterizing noise is fundamental to the design and analysis of imaging systems and to the development of their image-processing components. This lecture examines broad classes of heteroskedastic image observations, with emphasis on noise correlation, noise anisotropy, and nonlinear effects arising from low signal-to-noise ratio (SNR), limited bit depth, and the need to maximize coverage of a narrow dynamic range. Special attention is given to the largely overlooked case of spatially correlated heteroskedastic noise subject to clipping, including extreme underexposure and overexposure. We highlight several unexpected and counterintuitive phenomena that can significantly compromise noise analysis and other stages of an image-processing pipeline unless they are properly modeled and addressed. Examples are drawn from imaging and image-processing systems used in biomedical, defense, security, and consumer applications. These include X-ray tomography, infrared thermography, video streaming, confocal fluorescence microscopy, as well as scanning electron microscopy. In addition to conventional random noise in extremely low SNR conditions, the models presented can describe various forms of structured noise and artifacts, including streak and ring artifacts in tomography, cutting artifacts introduced during volume sectioning with a diamond microtome or an ion beam, and fixed-pattern noise.

Alessandro Foi (pictured right) received the M.Sc. degree in Mathematics from the Università degli Studi di Milano, Italy, in 2001, the Ph.D. degree in Mathematics from the Politecnico di Milano in 2005, and the D.Sc.Tech. degree in Signal Processing from Tampere University of Technology, Finland, in 2007. He is a Professor of Signal Processing at Tampere University, Finland, and the Director of Tampere University Imaging Research Platform. He is also the CTO of Noiseless Imaging, a company specialized in noise-removal, restoration, and enhancement technology for the imaging industry.
His research interests include mathematical and statistical methods for signal processing, functional and harmonic analysis, and computational modeling of the human visual system. His work focuses on spatially adaptive algorithms for the restoration and enhancement of digital images, on noise modeling for imaging devices, and on the optimal design of statistical transformations for the stabilization, normalization, and analysis of random data. He is a Fellow of the IEEE for his contributions to image restoration and noise modeling. He was the Editor-in-Chief of the IEEE Transactions on Image Processing from 2021 to 2023. He previously served as a Senior Area Editor for the IEEE Transactions on Computational Imaging and as an Associate Editor for the IEEE Transactions on Image Processing, the SIAM Journal on Imaging Sciences, and the IEEE Transactions on Computational Imaging. He was the Lead Technical Program Chair of the 2026 IEEE International Conference on Image Processing.



IEEE Boston Photonics Society – 6:00PM, Thursday, November 12

Design and Demonstration of the Airborne Concurrent Artificially-intelligent Spectrometry and Adaptive Lidar System

Time: 6:00PM, Thursday, November 12
Location: MIT Lincoln Laboratory, 244 Wood St, Lexington, Massachusetts. Building: A Café
Registration: https://events.vtools.ieee.org/m/583913
Speaker: Dr. Guangning Yang

The Boston Chapter of the IEEE Photonics Society invites you to a Tech talk on " Design and Demonstration of the Airborne Concurrent Artificially-intelligent Spectrometry and Adaptive Lidar System (CASALS)" by Dr. Guangning Yang, from NASA, Goddard Space Flight Center

6:00 pm - Meeting starts with light food
6:30 pm - Chapter Elections
7:00 pm - Speaker Presentation
8:00 pm - Meeting ends

Space laser altimeters provide high precision global elevation data needed for a broad range of science objectives, including determining ice sheet and glacier heights, sea ice thickness, vegetation structure and land flight (ToF) of laser pulses and the return laser pulse energy, to retrieve surface height and reflectivity at the laser wavelength. NASA has a 30-year history of operating laser altimeters in orbit to measure the elevation of the Earth's surface and its change. We present the lidar design and airborne demonstration of a concurrent artificially-intelligent spectrometry and adaptive lidar system (CASALS). A 1040 nm seed laser cycles through 256 wavelength steps while pulsing at 144 kHz. The wavelength stepped pulse train is efficiently amplified by fiber amplifiers and subsequently diffracted by a grating to illuminate 256 resolvable footprints on the surface. High laser peak power is retained for each footprint to improve performance. The footprints are imaged by a receiver (RX) telescope onto an entrance slit and reimaged onto an exit slit by a grating monochromator that rejects solar photons spatially and spectrally for all footprints. The footprints are subsequently relayed onto a 2x8 linear HgCdTe avalanche photodiode detector array whose 8 outputs are time-division multiplexed to two fast digitizers. The digitized waveforms are range-gated and streamed to a solid-state drive for post processing. The design increases coverage while reducing the power consumption owing to the fast non-mechanical steering of the efficiently generated laser beam, imaging the footprints across the nearly noiseless



Guangning Yang (pictured right) received his Ph.D. degree in Electrical Engineering from Drexel University, USA. For the past 18 years he has worked at NASA Goddard Space Flight Center on lidar and laser ranging. He was the Product Development Lead on photon counting detector for the ATLAS laser altimeter instrument on the ICESat-2 mission, Principal Investigator (PI) for the Laser Communications Relay Demonstration (LCRD) Optimetrics Experiment, and PI for the CASALS lidar development. He co-invented the CASALS lidar system. Prior to joining NASA, he worked at telecommunication industries for terminal hardware design and development for both submarine and terrestrial applications.

IEEE Boston Consultants Network and co-sponsored by Worcester Consultants Network - 6:30PM, Monday, November 16

Consultant Series - Consulting 101 and 201 Beginning Consulting and Advanced Consulting Includes Hiring

Time: 6:30PM, Monday, November 16
Location: Zoom and in-person at Stevens Memorial Library - CR, 345 Main Street North Andover
Registration: here
Speakers: Mark Fitzgerald and Larry Nelson Sr.

Two for One Night!

Beginning Consulting with Mark

- Consultants Value Add
- Finding the Proper Consultant
- Retaining a Consultant
- Getting started in the consulting business / headhunters
- Contracts 101 Potential Liability
- W2 work, direct C2C, Headhunters, Rates
- General: Incorporation, Insurance
- Presenting Your Company, Networking! Networking!

Advanced Consulting with Larry

- General Business Practices including some Truths and Lies
- Going it alone - The one person shop.
- Partnerships and associations. How to do more while keeping control and not having to do it all yourself.
- Working with Agencies. The Good, Bad, and Ugly.
- Diversification of your business. Adding services to keep a steady cash flow.

This session is a more advanced look at what you can and should do to grow your business and keep it healthy. Larry will show how he has made his consulting business stronger over the years, and how he modified his offerings to keep things moving forward and protect cash flow during good times and bad. Plus tips on hiring a consultant.



Larry Nelson Sr (pictured right) has been a consultant since 1980. He has over forty years of electronic and computer engineering design experience managing engineering projects and teams. Experience also includes production, prototyping, technical training, problem solving, and customer relations. Licensed PE in MA. Massachusetts

Mark Fitzgerald (pictured below) works electronics design in both hardware and software, and project management / Agile ScrumMaster, specializing in medical devices (IEC-62304), safety standard designs (IEC-61508). Networking and Control Systems (PLCs) too. He is an IEEE senior member and CNET board member as Chairman.



IEEE Boston Nuclear & Plasma Sciences & Social Implications of Technology – 10:30AM, Tuesday, November 17

Radio Wave Scintillation Propagation Models and Applications

Time: 10:30AM, Tuesday, November 17
Location: Boston College Newton Campus, 885 Centre St, Newton MA), Newton, MA, Massachusetts. Building: Kenny Cottle Conference Room 202
Speaker: Professor Ted Beach of Boston College
Registration: https://events.vtools.ieee.org/m/586406

When ionospheric plasma becomes turbulent, radio signals that pass through it experience scintillation. Scintillation manifests as random fluctuations in phase and amplitude (and potentially in other quantities like polarization angle). The effect is similar to the optical twinkling of starlight that passes through lower-atmosphere turbulence. Ionospheric scintillation has the potential to impact systems like synthetic aperture radar (SAR), direct-to-device (D2D) satellite communications and Global Navigation Satellite System (GNSS) observations.

This talk will first present an overview of the propagation physics that leads to the practical model of the ionosphere as a phase changing screen ("phase screen"). We will then explore selected deterministic and random phase screen examples to gain some intuition for amplitude and phase scintillation impacts. Finally, we examine some recent applications of scintillation observations to deducing the physical state of the ionosphere, such as the decay of equatorial plasma bubble (EPB) turbulence. Not only does scintillation allow us to track when and where ionospheric irregularities develop, careful analysis may yield more quantitative physical details of the irregularity processes.

Dr. Theodore Beach (pictured below) is a senior research engineer in the Institute for Scientific Research at Boston College. He has studied ionospheric scintillation since his doctoral research. He has also worked with spaceflight projects, including the Communication/Navigation Outage Forecasting System (C/NOFS) at the Air Force Research Laboratory and several CubeSat sensor and subsystem projects in the private sector. He received his Ph. D. in electrical engineering from Cornell University in 1998. He is a Senior Member of the IEEE and incoming Vice Chair of Commission G for the United States National Committee for the International Union of Radio Science (USNC-URSI).



Want to Get Involved?

Check out our Chapters, Affinity Groups and Local Groups

ieeeboston.org

IEEE Boston Reliability Society & Women in Engineering - 5:30PM, Wednesday, November 18

Robust AI with the Coupled Entropy

Time: 5:30PM, Wednesday, November 18
Location: In-person attendance is encouraged. MIT Lincoln Laboratory, 244 Wood St, Lexington, MA, Building: Main Cafeteria. In case you cannot attend in person, a Zoom link will be posted before the event.
Speaker: Kenric Nelson
Registration: https://events.vtools.ieee.org/m/586917

This event will be hybrid, but we encourage in-person attendance. Registration is free, but is required so that we can plan pizza, salad, and beverages. When arriving Wednesday evening, please be prepared to show a government-issued photo ID, such as a Massachusetts driver's license, at the main gate at Wood Street. Tell the guard that you would like to attend the IEEE Reliability meeting in the Main Cafeteria.

After parking, walk towards the main building near the flagpole. Before entering, look left, and walk down the steps. At the bottom of the steps, turn right. Walk straight through the double set of double doors and straight into the Main Cafeteria.
Looking forward to seeing you in person!
Dan Weidman - Chair, Reliability Chapter

Traditional statistical methods assume that physical and artificial systems exist in thermodynamic equilibrium, where uncertainty follows exponential distributions. However, real-world complex adaptive systems, such as hydro-meteorological hazards, biological population shifts, epidemiological outbreaks, and volatile financial markets—operate far from equilibrium. In these systems, heavy tails with extreme fluctuations often result in divergent variance. Artificial intelligence (AI) algorithms are trained to minimize variations on the cross-entropy between a learned distribution and a training set. In linear, non-fluctuating systems, the learning process is optimizing the configurational DOF (degrees of freedom); however, in nonlinear, fluctuating systems, the nonlinear DOF dominates.
The coupled entropy addresses this issue by separating linear scale (known unknowns) from non-linear tail shape (unknown unknowns). By taking mathematical expectations over a modified probability space called the independent-equals distribution, coupled entropy increases the penalty on rare outliers while dampening their sampling frequency. This keeps sampling variance finite during training while still capturing the dynamics of the original complex system. The coupled entropy has been proven to be the only function that reduces the nonlinear DOF to zero, when matched to the nonlinearity of the system.
Building directly on an empirical foundation, we propose the Active inference with Coupled free Energy (ACE). This work offers a framework for autonomous agents operating in extreme environments.

Dr. Kenric Nelson (pictured below) is the Founder and President of Photrek, Inc., which is developing novel approaches to Risk Governance, including



risk-aware machine intelligence, particularly for environmental risks, and governance policies for decentralized communities. Nelson is the inventor of the Coupled Entropy and its application to learning extreme models. Prior to launching Photrek, Nelson was a Research Professor with Boston University's Electrical & Computer Engineering Department (2014-2019) and a Sr. Principal Systems Engineer with Raytheon Company (2007-2019). His education in electrical engineering includes a B.S. degree Summa Cum Laude from Tulane University, an M.S. degree from Rensselaer Polytechnic Institute, and a Ph.D. degree from Boston University. His management education includes an Executive Certificate from MIT Sloan and participation in NSF's I-Corps program.

IEEE Boston Microwave Theory & Technologies Society/Antennas & Propagation & Young Professionals - 5:00PM, Thursday, November 19

Joint MTT/AP-S Outstanding Young Professionals Seminar & Chapter Elections

Time: 5:00PM, Thursday, November 19
Location: 1 Analog Way, Wilmington, Massachusetts, Room Number: Hubble Auditorium
Speaker: Damla Dimioglu of Cornell University
Registration: https://events.vtools.ieee.org/m/586924

Please join the IEEE Boston MTT/AP-S Chapter for a free in-person Joint MTT/AP-S Outstanding Young Professionals seminar with Damla Dimlioglu "VSWR Sensitivity of the mmWave PA Performance in Integrated Transmit Phased Arrays " and Maede Chavoshi "Microwave Dielectric Spectroscopy from a Biomedical Perspective: Current Trends Towards Future Applications".

We will have a brief social period from 5:00-5:15pm, followed by the staggered technical seminars from 5:15-5:45pm and 5:45-6:15pm. Elections, Q/A, and social period follows until 7pm. Details regarding the room location will be provided to registered attendees shortly prior to the seminar.
Refreshments will be provided. Please note if you have any dietary restrictions.

Topic 1: VSWR Sensitivity of the mmWave PA Performance in Integrated Transmit Phased Arrays

Details TBA

Topic 2: Microwave Dielectric Spectroscopy from a Biomedical Perspective: Current Trends Towards Future Applications

The analysis of chemical and biological samples is essential for the diagnosis and treatment of diseases. In many bio-laboratories, this analysis relies on methods that require bulky optical setups, labeling and chemical manipulation, or direct contact with the samples, which can be invasive or prone to contamination. However, because biological samples contain a high water content, they can be characterized more intelligently and efficiently.

Microwave dielectric spectroscopy (MDS) offers a non-invasive, label-free, contactless, and rapid alternative. The unique interaction between water molecules and electromagnetic waves at microwave frequencies forms the foundation of MDS. Using sensitive sensors that tightly confine electromagnetic fields, MDS enables the characterization of samples with volumes as small as nanoliters. At higher power levels, microwaves can also provide rapid, contactless, and material-specific heating. These properties create new opportunities for simultaneous sensing and thermal actuation at microscales.



This talk presents recent advances in microwave dielectric spectroscopy for biomedical applications, spanning innovations in sensor design, material platforms, and machine-learning techniques that support both device development and biological characterization. The presentation will also discuss future perspectives of MDS in emerging areas such as neuroscience and next-generation materials for healthcare.

Damla Dimlioglu (pictured above) received the B.S. degree in Electrical & Electronics Engineering with a minor in Solid-State Physics from Middle East Technical University, Turkey, in 2012, and the M.S. degree in Electrical Engineering with a minor in Semiconductor Devices and Physics from the University of California, Davis, CA, in 2015. Her M.S. research focused

on novel high-speed and low-power SAR ADC architectures based on time-to-digital conversion. She is currently pursuing her Ph.D. degree at Cornell University, NY, focusing on Out-of-Band Interference-Tolerant mmWave Receivers on CMOS, SiGe, and GaN technologies for high-data-rate wireless communications and sensing. In 2023, she demonstrated the first GaN N-path passive mixer ever reported to date in a mixer-first downconverter prototype and presented it to the Director of NIST, who oversees the CHIPS Act under the U.S. Secretary of Commerce. Before joining Cornell in 2020, she was an R&D mmWave IC design intern at Next Generation Radio Integration Lab at Intel Labs, OR, working on Nonlinear Distortions in mmWave Phased Array Transceivers. She worked on tunable PLLs at Analog Devices, CA (2015), high-speed optical modulator drivers at Bell Laboratories, NJ (2016), and bandwidth extension techniques for broadband amplifiers at Intel Labs, OR (2017).

Damla is a reviewer for the IEEE Journal of Solid-State Circuits (JSSC), IEEE Solid-State Circuits Letters (SSC-L), IEEE Transactions on Circuits and Systems-I (TCAS-I), IEEE Journal of Microwaves (JMW), IEEE Microwave Magazine, IEEE Microwave and Wireless Technology Letters (MWTL), and IEEE Transactions on Microwave Theory and Techniques (T-MTT). She has been an editor for the IEEE Microwave Magazine since 2025. She serves as a TE on the Editorial Board of the IEEE Journal of Microwaves (JMW) for the technical tracks Microwave and mmWave Integrated Circuits and RF/Mixed-Signal Integrated Circuits and Signal Processing.

She has been a member of the MTT-S TC-14 Microwave and Millimeter-Wave Integrated Circuits Committee and the IEEE International Microwave Symposium Technical Program Review Committee (IMS TPRC) since 2021. She also served on the 2023 IEEE IMS Early Career Paper Competition Review Committee. Since 2025, she has served on the technical review committees of the European Microwave Integrated Circuits (EuMIC), European Microwave Conference (EuMC), German Microwave Conference (GeMiC), IEEE Space, Aerospace and Defense (IEEE SPACE), IEEE Microwaves, Antennas, and Propagation (IEEE MAPCON), and IEEE BiCMOS and Compound Semiconductor Integrated Circuits and Technology Symposium (IEEE BCICTS) conferences. She is the TPC Co-chair for the 2026 IEEE Texas Symposium on Microwave and Wireless Circuits and Systems (IEEE MWCS).
Damla is the recipient of the 2024 IEEE Solid-State Circuits Society Rising Stars Award.

She has been named one of the 2026 IEEE MTT-S Outstanding YP Lecturers in the global cohort of 8 newly selected speakers.

Maede Chavoshi (pictured below) received her Ph.D. in Electrical Engineering from KU Leuven, Belgium, in 2025, where her research focused on microwave sensing and heating technologies for life-science applications. She is currently Head of R&D at Glaucus Inc., where she leads multidisciplinary research and development efforts focused on advanced biosensing technologies and their translation into integrated biomedical systems.

She is a 2026 IEEE MTT-S Outstanding Young Professionals Lecturer and a recipient of the ARFTG Roger Pollard Student Fellowship and IEEE MTT-S Graduate Fellowship. She served as Local Arrangements and Publication Co-Chair of IMBioC 2023, Publication Co-Chair of IMBioC 2024 and 2026, and Chair of the IEEE AP/COM/MTT Student Branch Chapter at KU Leuven. She is also an affiliate member of IEEE MTT-S Technical Committee 28 (Biological Effects



IEEE Boston Power & Energy Society – 6:00PM, Thursday, November 19

Interconnection of Distributed Energy Resources (DERs) and Grid Modernization

Time: Refreshments start at 6pm, talk begins at 6:30pm, Thursday, November 19
Location: Wentworth Institute of Technology. Building: Ira-Allen Building, 540 Parker St, Roxbury, MA
Speaker: Babak Enayati, VP, Grid Integration
Registration: here

Pre-Event Happy Hour with Young Professionals in Energy (YPE) Boston

Pre-Event: Puddingstone Tavern
Event begins at 5pm

As Distributed Energy Resources (DERs) continue to grow, engineers face new challenges integrating them into a grid not originally designed for decentralized energy. This seminar provides a comprehensive look at DER interconnection, protection strategies, and the evolving standards like IEEE 1547. Participants will also explore grid modernization technologies, battery storage, and real-world microgrid case studies to understand the full scope of transformation in today's power systems. The audience is expected to:
• Understand the technical and regulatory requirements for interconnecting DERs, including IEEE 1547 standards.
• Analyze protection challenges and solutions associated with inverter-based resources and microgrids.
• Evaluate grid modernization technologies and strategies, including battery storage and non-wires alternatives.

Babak Enayati (pictured right) serves as Nexamp's Vice President of Grid Integration. In this role, he leads a team responsible for managing renewable generation applications submitted to utilities and grid operators, ensuring strict compliance with technical and regulatory requirements. Under Babak's leadership, the Grid Integration team strives to set the standard for clean energy integration through innovative technical solutions, policy advocacy, strategic stakeholder engagement, and a steadfast commitment to safety, reliability, and affordability. These efforts enable Nexamp to lead the industry and thrive in the clean energy transition.

Prior to joining Nexamp, Babak spent 14 years in the utility industry, holding various engineering and managerial roles focused on distributed energy resource (DER) interconnections. From 2022 to 2023, he served as the Director of Engineering at New Leaf Energy, where he oversaw a team providing technical support for wind, solar, and energy storage developments.

Babak is a Senior Member of IEEE and a licensed Professional Engineer in Massachusetts. He also served as Vice Chair of the IEEE 1547 and IEEE 2800 standards for interconnecting generation onto the distribution and transmission networks.

Parking Directions:

Address: 540 Parker St, Roxbury, MA 02120. Please Park in the green area shown in the following map. Free and Open to the Public; RSVP is appreciated Visit our web page to RSVP and for further details – IEEE PES Boston



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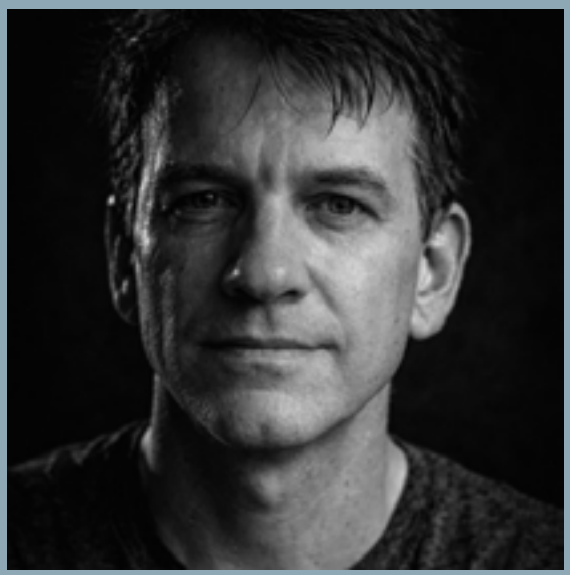
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IEEE Boston Section

IEEE Boston Section Volunteers Wanted!

Are you passionate about technology and eager to contribute to the advancement of your field? The IEEE Boston Section is excited to announce a call for volunteers to join our dynamic team of professionals and enthusiasts. By becoming a volunteer, you'll have the opportunity to collaborate with like-minded individuals, develop new skills, and make a meaningful impact on the local technology community.

About IEEE Boston Section:

The IEEE Boston Section is a thriving community of engineers, researchers, students, and industry professionals dedicated to promoting technological innovation and knowledge sharing. Our section hosts a variety of events, workshops, seminars, and conferences throughout the year, providing members with opportunities to learn, network, and stay updated on the latest developments in their fields.

Volunteer Opportunities:

We are currently seeking volunteers to help on the following committees:

The Fellow and Awards Committee - activities include recommending qualified members of the Section for advancement to Fellow grade and for receipt of the various IEEE (IEEE/Region/MGA/Section) awards. Identifying and building a database of the various IEEE awards available for nomination and searching out qualified candidates, for preparing the necessary written recommendations, and for assembling all required supporting documentation and submit its recommendations directly to the appropriate IEEE body.
Time Commitment: Meets 4 times a year for 1 – 2 hours per meeting (virtual or in person)

Local Conferences Committee - activities include identifying timely topical areas for conference development. Identify champions of these conferences to run the identified conference organizing committees. The section local conference committee is not charged with organizing and executing individual conferences.
Time Commitment: Meets 4 times per year 1 – 2 hours per meeting (virtual or in person)

Professional Development & Education Committee - activities include identifying topics, speakers, and/or organizers for appropriate technical lecture series or seminars. The subject matter should be timely, of interest to a large segment of the membership, and well organized with regard to speakers and written subject matter.
Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

The Membership Development Committee - activities include actively promoting membership in the IEEE and shall encourage members to advance to the highest grade of membership for which they are qualified. To these ends this committee shall include wide representation within the Section territory, shall maintain lists of prospects and members qualified for advancement, and shall provide information and assistance to preparing applications.
Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

Student Activities Committee - activities include attracting a broad and diverse group of undergraduate and graduate students to IEEE and to engage them in activities that promote their own professional development as well as the ongoing growth of IEEE. The Student Activities Committee shall include among its members the IEEE Counselors at the universities, colleges, and technical institutes that lie within the Section territory. It shall be responsible for liaison with the Student Branches at these institutions and advise the Executive Committee on all other matters affecting the Student Members of the Section.
Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

Young Professionals Affinity Group - activities include organizing programs, and initiatives aimed to address the needs of early-career professionals pursuing technology-related careers in engineering, business, management, marketing, and law. This committee is committed to helping young professionals evaluate their career goals, polish their professional image, and create the building blocks of a lifelong and diverse professional network.
Time Commitment: meets 4 times per year, 1 – 2 hours per meeting (virtual or in person)

Benefits of Volunteering:

Volunteering with IEEE Boston Section offers numerous benefits, including:

- Networking opportunities with professionals in your field.
- Skill development and enhancement through hands-on experience.
- Contribution to the local technology community and its growth.
- Access to cutting-edge information and discussions.

How to Get Involved:

If you're enthusiastic about technology and want to make a difference, we invite you to join us as a volunteer. To express your interest and learn more about specific roles, please visit our website and fill out the volunteer application form. Our team will get in touch with you to discuss opportunities that align with your interests and skills.

Thank you for considering this opportunity to contribute to the IEEE Boston Section. Your dedication and passion are what drive the success of our community and its impact on the world of technology.

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