

BOSTON



2022 IEEE INTERNATIONAL
SYMPOSIUM ON
TECHNOLOGIES FOR
HOMELAND SECURITY (HST)

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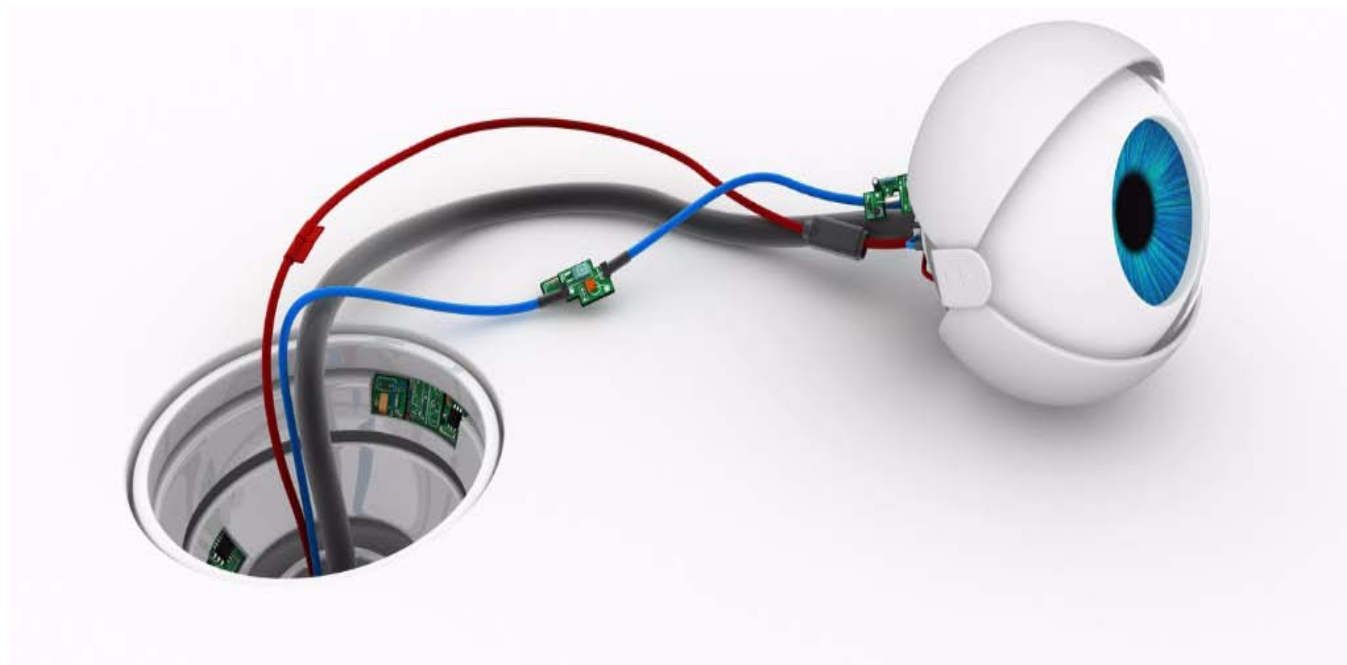


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The IEEE – An Amazing Organization

By Arthur Winston, IEEE Boston Section Executive Committee

I have entitled this editorial, “The IEEE – An Amazing Organization”. I will give a few examples as to why this is so. You are most likely to be aware of IEEE’s attributes but haven’t stopped to appreciate its greatness.

I have been a member of the IEEE for 67 years. Actually, I was originally a member of the IRE (the Institute of Radio Engineers) which merged with the AIEE (the American Institute of Electrical Engineers) in 1963 to become the IEEE (the institute of Electrical and Electronic Engineers).

I consider the IEEE to be an amazing organization and would like to give a few reasons why. The examples are in addition to the activities of the numerous societies; organizational units; the Foundation and HKN; the creation of conferences, publications and standards. The IEEE has 395,000 members in 160 countries. It is an international organization with headquarters in the US. Its mission is to “advance technology for humanity”. It is the world’s largest technical professional organization.

I attended a Region 8 meeting in Europe. It was at a time when there was some strife in the Middle East. The UN was unable to cool the situation and get the countries to engage in peaceful dialect and action. But at the IEEE meeting., the representatives from Iran, Iraq, Israel, and Jordan sat next to one another. Here was friendship and a working together – something the UN could not accomplish.

Several countries have engineering societies, and it is common for them to enter unto a formal agreement with IEEE. During my presidency, I visited Warsaw with the intent of signing such an agreement. The Polish committee had set up a very nicely decorated place for the signing. There was a Polish flag and the Stars and Stripes of the United States. I explained that they should remove the US flag which they had placed there

because they considered that the Polish organization was entering an agreement with a US organization. I explained that the IEEE was an international organization with headquarters in the US. They then removed both flags. I had them replace the Polish flag. Now, they understood that the IEEE was an international organization.

Sometimes it is necessary to educate a group or association in depth about IEEE. Case in point:

The US State Department identifies a list of countries with which it wants to restrict business relations. The action is implemented through the Office of Foreign Asset Control (OFAC). The restrictions impacted the IEEE and publishers globally. The major publishers got together and decided to sue the US Government. IEEE was included in the group. This event was occurring when I became President. In reviewing the situation, I believed suing the Government was not the way to proceed. I visited OFAC, spent time with them and educated them on the workings of IEEE and how it contributes to the US and the world. The end result was that they modified their restrictions so IEEE could operate with countries on the list (exception Cuba). The value of the IEEE and how it conducts its business was now understood and appreciated. The modification extended to all companies in addition to the IEEE and we became heroes globally.

Another example of this amazing organization is the case of an intelligent engineering woman student, upon graduation, had hoped to work for a specific technical company. But they had just ruled that they were no longer hiring or interviewing candidates. The student got her successful interview because of the IEEE network.

In summary, it should be no wonder why I consider the IEEE to be an amazing organization that is accomplishing what governments and countries have difficulty doing.



What + If = IEEE

420,000+ members in 160 countries.
Embrace the largest, global, technical community.

People Driving Technological Innovation.

iee.org/membership

#IEEEmember



KNOWLEDGE

COMMUNITY

PROFESSIONAL DEVELOPMENT

CAREER ADVANCEMENT

IEEE Boston Section Online Courses:

(Students have 180 day access to all online, self-paced courses)

Electronic Reliability Tutorial Series

Full course description and registration at ,
<http://ieeeboston.org/electronic-reliability/>

High Performance Project Management

Full course description and registration at ,
<http://ieeeboston.org/high-performance-project-management-online-course/>

Introduction to Embedded Linux Part I

Full course description and registration at ,
<http://ieeeboston.org/introduction-to-embedded-linux-part-i-el201-online-course/>

Embedded Linux Optimization - Tools and Techniques

Full course description and registration at ,
<http://ieeeboston.org/embedded-linux-optimization-tools-techniques-line-course/>

Embedded Linux Board Support Packages and Device Drivers

Full course description and registration at ,
<http://ieeeboston.org/embedded-linux-bsps-device-drivers-line-course/>

Software Development for Medical Device Manufacturers

Full course description and registration at ,
<http://ieeeboston.org/software-development-medical-device-manufacturers-line-course/>

Fundamental Mathematics Concepts Relating to Electromagnetics

Full course description and registration at ,
<http://ieeeboston.org/fundamental-mathematics-concepts-relating-electromagnetics-line-course/>

Reliability Engineering for the Business World

Full course description and registration at ,
<http://ieeeboston.org/reliability-engineering-business-world-line-course/>

Design Thinking for Today's Technical Work

<http://ieeeboston.org/design-thinking-technical-work-line-course/>

Fundamentals of Real-Time Operating Systems

<http://ieeeboston.org/fundamentals-of-real-time-operating-systems-rt201-on-line-course/>



IEEE HST Virtual Symposium Coming in November!

**COMPLIMENTARY
REGISTRATION AVAILABLE!**

HST Symposium Coming 14 – 15 November 2022

The 21st IEEE Symposium on Technologies for Homeland Security (HST '22) will be held November 14 - 15, 2022 as a virtual symposium. This symposium brings together innovators from leading academic, industry, businesses, Homeland Security Centers of Excellence, and government agencies to provide a forum to discuss ideas, concepts, and experimental results.

Produced by IEEE with technical support from IEEE, IEEE Boston Section, and IEEE-USA and organizational support from MIT Lincoln Laboratory and Raytheon, this year's event will once again showcase selected technical papers and posters highlighting emerging technologies in:



**Cyber
Security**



**Frontier and Emerging
Technologies**



**Climate and Homeland
Resilience**



**Border Security, Critical
Infrastructure Protection
& Law Enforcement**

See IEEE-HST.ORG for more details!

Consumer Technology Society Call for Volunteers!

We are currently looking for volunteers who would be interested in pushing forward the mission of the Consumer Technology (CT-S), Boston Chapter. The chapter is looking for volunteers to help organize chapter meetings and help meet the needs of the local CT-S member needs.

The Boston Section is organizing chapters into groups of similar technical interest areas to pool their resources for easier and better chapter collaboration in planning the chapter events.

If you have interest in volunteering for a chapter leadership position or are interested in learning more about what these volunteer positions may entail, please send an email to Karen Safina in the IEEE Boston Section office at, ieeebostonsection@gmail.com

Aakash Deliwala, Chair, IEEE Boston Consumer Technology Chapter

Engineering in Medicine & Biology Society Call for Volunteers!

We are currently looking for volunteers who would be interested in pushing forward the mission of the Engineering in Medicine & Biology Society (EMBS), Boston Chapter. The EMBS - Boston Chapter was recently approved in July 2021, and we're looking to make a significant impact in the area of Biomedicine, Bioengineering, and Biotechnology in the region. The chapter is looking for volunteers to help organize chapter meetings and help meet the needs of the local EMBS members.

The Boston Section is organizing chapters into groups of similar technical interest areas to pool their resources for easier and better chapter collaboration in planning the chapter events.

If you have interest in volunteering for a chapter leadership position or are interested in learning more about what these volunteer positions may entail, please send an email to Karen Safina in the IEEE Boston Section office at, ieeebostonsection@gmail.com.

Aseem Singh, Marie Tupaj, Co-Chairs, Boston EMBS Chapter

IEEE Video Series

A collaborative discussion panel featuring esteemed members from the Institute of Electrical and Electronics Engineers has convened in 2021 to produce educational video presentations that embrace IEEE's mission of advancing technology for humanity.

Among the programs they've produced include "Electric Vehicles: Fun Saving Our Planet", "Greener Power For More Electric Vehicles", "Overcoming Nuclear Fears To Achieve Net Zero CO2 By 2050" and "Achieving a Net Zero Carbon Future", "Green Energy's Economic Progress", and "Net-Zero CO2 with Nuclear, Hydrogen and Geothermal". Projects currently in production include the expansive topic of futurology, with a focus on increasing the efficiency and transformation of aging electrical power generating stations and infrastructure to accommodate nuclear power; reviewing the viability of alternative energy (such as geothermal, wind and solar); and focusing on 'cleaner' fossil fuels that are more environmentally-friendly to slow the rate of climate change.

These shows are produced and directed by Lennart E. Long, IEEE Senior Life Member from the Executive Committee and Past Chair of the Boston Section; Dr. Paul H Carr, BS, MS, MIT; PhD Brandeis U, IEEE Life Fellow; Dr. Ted Kochanski, SB (MIT), Ph.D (U.Texas, Austin), IEEE Global Education for Microelectronic Systems and former Boston Section Chair; and Dr. Ken Laker, B.E. (Manhattan College), M.S. and Ph.D. (New York University), IEEE Life Fellow and past President of IEEE.

The panel is moderated by five-time Boston/New England Emmy Award-winner and television personality and star of "The Folklorist," John Horrigan. These video programs with presentations and discussions can be accessed at the IEEE Boston Section video portal at <https://vimeo.com/user18608275>.

We are looking for any IEEE members that would like to appear on the program in the role of presenter or discussion expert. Simply reach out to Robert Alongi at the Boston Section at, ieeebostonsection@gmail.com.

Call for Course Speakers/Organizers

IEEE's core purpose is to foster technological innovation and excellence for the benefit of humanity. The IEEE Boston Section, its dedicated volunteers, and over 8,500 members are committed to fulfilling this core purpose to the local technology community through chapter meetings, conferences, continuing education short courses, and professional and educational activities.

Twice each year a committee of local IEEE volunteers meet to consider course topics for its continuing education program. This committee is comprised of practicing engineers in various technical disciplines. In an effort to expand these course topics for our members and the local technical community at large, the committee is publicizing this CALL FOR COURSE SPEAKERS AND ORGANIZERS.

The Boston Section is one of the largest and most technically diverse sections of the IEEE. We have over 20 active chapters and affinity groups. If you have an expertise that you feel might be of

interest to our members, please submit that to our online course proposal form on the section's website (www.ieeeboston.org) and click on the course proposal link (direct course proposal form link is

<http://ieeeboston.org/course-proposals/> . Alternatively, you may contact the IEEE Boston Section office at ieeebostonsection@gmail.com or 781 245 5405.

- **Honoraria can be considered for course lecturers**
- Applications oriented, practical focused courses are best (all courses should help attendees expand their knowledge based and help them do their job better after completing a course)
- Courses should be no more than 2 full days, or 18 hours for a multi-evening course
- Your course will be publicized to over 10,000 local engineers
- You will be providing a valuable service to your profession
- Previous lecturers include: Dr. Eli Brookner, Dr. Steven Best, Colin Brench, to name a few.

Entrepreneurs' Network – 6:00PM, Tuesday, October 4

Structuring Your Company

Location: Microsoft Technology Center, 5 Wayside Rd, Burlington, MA

Registration: <https://bostonenet.org/events/structuring-your-company/>

Attendees will have the option to join us in-person at the Microsoft Technology Center in Burlington, MA or online via Zoom.

ENET's panel of legal experts will discuss fundamental legal issues that founders and executives of early-stage companies must address to insure vital protections and the building of value. These issues are compounded by changes in technology, commerce, and the law.

What is the preferred form of entity and where should it be established?

What is the preferred method to protect the company's Intellectual Property by use of various forms of patent, copyright, trademark, and trade secrets, either alone or in combination?

How should founders' equity be apportioned through stock options and what restrictions should apply?

What compensation and benefits should be included in employee agreements including consideration of Non – Disclosure Agreements, the changing environment for Non – Compete Agreements, as well as Assignment of Invention Agreements?

These issues and their benefits and pitfalls will be discussed and presented with you, the business professional, in mind.

More information: This is a hybrid event. You may choose to participate in-person or online.

In-person Participation (check-in begins at 6:00 PM):

LOCATION: Microsoft Technology Center, 5 Wayside Road, Burlington, MA 01803. **PARKING:** Free parking is available. **REFRESHMENTS:** Pizza will be served.

COVID POLICY: You are required to provide proof of vaccination or self-attest to having received a negative COVID-19 test within the previous week via HealthCheck. Attendees who do not upload proof of vaccination must wear a face covering onsite.

Online Participation: Zoom links will be sent to all registrants after registration.

COST AND RESERVATIONS: This event is free for ENET members and \$10 for non-members. Click here to learn how to become a member. To expedite sign-in for the event, we ask that everyone — members as well as non-members — pre-register. Pre-registration is available until midnight the day before the meeting. If you cannot pre-register, you are welcome to register in person at the door while seats are available.

Registration: <https://bostonenet.org/events/structuring-your-company/>

Event Schedule

6:00 pm	Networking
7:00 pm	Introduction, ENET Chairperson's announcements
7:10 pm	eMinute Pitch, up to 3 startup pitches
7:25 pm	Expert Panel, 4 expert speakers on the night's topic
8:10 pm	Q & A Moderator and Audience Q & A with the speakers
8:30 pm	Networking, panelists will be available afterward for responses to individual questions.

Speakers:

Kent Gregoire, Founder and CEO of Symphony Advantage, serial entrepreneur, angel investor.



Kent Gregoire is one of the first certified conscious capitalism global consultants and he is the Founder and CEO of Symphony Advantage, which has provided advisory and consulting services to executive level managers for over 35 years. In addition, Mr. Gregoire is also a serial entrepreneur and an angel investor in purpose-driven companies. Mr. Gregoire launched his first manufacturing company at age 14. Since then, he founded or led more than a dozen organizations. He has been involved in all phases of their business cycle from startup to growth to repositioning. He also led many of these to successful exits and raised tens of millions of dollars in capital.

In his consultancy work, Mr. Gregoire is known as the 'CEO to 'CEOs' who focuses on a win-win approach that delivers exponential value to all stakeholders, including leaders, shareholders, employees, customers, suppliers, and the environment. Mr. Gregoire is a cov-

eted speaker who has shared his powerful insights in venues such as the United Nations, FintechSouth, and many others. Mr. Gregoire is a published author in the Harvard Business Review as well as in Inc.com and Forbes. He is also the incoming president of the Entrepreneurs' Organization U.S. East Bridge chapter and a member of the Conscious Capitalism Senior Leadership Network.

<https://www.linkedin.com/in/kentgregoire/>



David Powsner, Intellectual Property attorney, Davis, Malm & D'Agostine, P.C., Boston Harbor Angels Angel Investor

Attorney Powsner is an Intellectual property attorney and Boston Harbor Angel Investor. He is an active angel investor and advisor to high-tech companies on a range of complex matters. His physics degree from MIT and experience in computer programming, combined with his legal experience, enables him to understand, analyze and provide practical guidance on patent, copyright, trade secret, trademark, licensing and litigation matters.

Attorney Powsner represents companies with products in a variety of tech markets, from medical devices to computer software to networking to consumer electronics.

<https://www.linkedin.com/in/davidpowsner/>



Mary Beth Cicero, MBA, CLP, Co-Founder & CEO of 3Daughters, Inc.

Mary Beth Cicero is Co-Founder and CEO of 3Daughters, Inc., Evolutionary Women's Healthcare for Women, developing a newly designed nonhormonal intrauterine device (IUD) for contraception. She has over 40 years of executive leadership skills and was formerly the President of MarketSense Ltd., with prior business development, marketing, pharmaceutical sales at both smaller and large biotech/pharmaceutical firms. Ms. Cicero has an extensive network of C-suite, high level corporate development professionals and investors, thought leaders, clinicians and patients, as well as patient advocacy groups. Her educational background includes a BS in Biology cum laude from Boston College and an MBA from Babson College. Ms. Cicero is a Certified Licensing Professional™ (CLP).

<https://www.linkedin.com/in/mary-beth-cicero-2209323/>

Moderator and Co-Organizer:

Kristin King, MBA. Vice President, Corporate Develop-



ment & Strategy, Defibtech, LLC

Ms. King is an accomplished MedTech executive, serial intrapreneur, investor and strategic advisor to startups developing biotech solutions. With over 20 years of experience spanning technical topics, marketing topics, and investing as she is a proud member of Boston Harbor Angels, she offers multi-disciplinary expertise in transforming technologies from early concept to successful global divisions at leading Medical Device companies and startups.

<https://www.linkedin.com/in/kristin-king-mba/>

Co-organizer:



William Mansfield, Esq., Secretary of Boston ENET, Member of Boston ENET's Executive Committee and Managing Attorney at Mansfield Law

Attorney Mansfield is a registered patent attorney licensed by the USPTO in all 50 states and he is an attorney in Massachusetts and

New York and his high bar exam scores in those two states have allowed him to waive into the D.C. Circuit. He won the prestigious CALI Award for perfect grades in an IP course, and he has passed the Fundamentals of Engineering Exam covering all types of engineering. He assists clients with corporate and intellectual property law using trademarks, trade dress, copyrights, licensing, patents, trade secret protection (including non-disclosure agreements, non-solicitation agreements, non-compete agreements, and assignments of IP rights), strategic partnerships, and succession planning. He also creates and review leases, employment contracts, term sheets involved in raising capital for his clients, and other contracts. From 2004, he has worked on legal matters and he has counseled entrepreneurs and startups since 2009 through Mansfield Law. He has worked on patent prosecution, especially business method, business process, electrical, mechanical, fintech, AI, telecommunications, life science and medical device, and e-commerce patents. He has filed for global IP protection and works with a network of foreign IP professionals. His Twitter handle is @patentmansfield, his telephone number is 857-333-1876, his website is <https://www.protectyourpassionalways.com/>, and his e-mail address is hello@protectyourpassionalways.com.

<https://www.linkedin.com/in/protectyourpassion/>

Registration: <https://bostonenet.org/events/structuring-your-company/>

New Hampshire - Microwave Theory & Techniques/Antennas & Propagation Societies -
6:00PM, Tuesday, October 11

From Engineering Electromagnetics to Electromagnetic Engineering: Teaching/Training Next Generations

Speaker: Prof. Dr. Levent Sevgi

Hybrid Presentation

Registration is required in order to receive link via e-mail for the live video if attending virtually.

Location: Nashua Public Library, 2 Court Street,
Nashua, NH 03060. Room Number: Theater Room

Agenda:

6:00PM to 6:15PM: Meet and greet

6:15PM to 7:15PM: Presentation

7:15PM: Optional dinner with speaker at a nearby restaurant

Come hear, in-person or virtually, IEEE AP-S Distinguished Lecturer (DL) Dr. Levent Sevgi's broad presentation on the importance of and challenges in teaching electromagnetics in electrical engineering today. His presentation is meant for a general audience and has been well-received throughout the world in his travels as the 2020 - 2023 IEEE AP-S DL. Dr. Sevgi brings over 40 years of electromagnetics experience, in both academic R&D and industry, to his role as an IEEE AP-S DL. **See the full presentation abstract and register at <https://events.vtools.ieee.org/m/323548>.** Everyone is welcome, from practitioner to retiree, and even undergrad students will especially enjoy it. (Don't worry if you can't remember all of Maxwell's Equations!). IEEE events are open to all; you do not have to be an IEEE member to attend.

Parking at the Nashua Public Library's parking lot is paid by the hour, via parking meters; see the lot's \$/hr rates and location along the southern bank of the Nashua River at <https://www.nashuanh.gov/DocumentCenter/View/6306/Downtown-ParkingBrochure-PDF?bidId=>.

The role of Electromagnetic (EM) fields in our lives has been increasing. Communication, remote sensing, in-

tegrated command/ control/surveillance systems, intelligent transportation systems, medicine, environment, education, marketing, defense are only a few areas where EM fields have critical importance. We have witnessed the transformation from Engineering Electromagnetics to Electromagnetic Engineering for the last few decades after being surrounded by EM waves everywhere. Among many others, EM engineering deals with broad range of problems from antenna design to EM scattering, indoor-outdoor radiowave propagation to wireless communication, radar systems to integrated surveillance, subsurface imaging to novel materials, EM compatibility to nano-systems, electroacoustic devices to electro-optical systems, etc. The range of the devices we use in our daily life has extended from DC up to Terahertz frequencies. We have had both large-scale (kilometers-wide) and small-scale (nanometers) EM systems. Large portion of these systems are broadband and digital, and have to operate in close proximity that results in severe EM interference problems. Engineers have to take EM issues into account from the earliest possible design stages. This necessitates establishing an intelligent balance between strong mathematical background (theory), engineering experience (practice), and modeling and numerical computations (simulation).

This keynote lecture aims at a broad-brush look at certain teaching / training challenges that confront wave-oriented EM engineering in the 21st century, in a complex computer and technology-driven world with rapidly shifting societal and technical priorities.

The lecture also discusses modeling and simulation strategies pertaining to complex EM problems and supplies several user-friendly virtual tools, most of which have been presented in the IEEE AP Magazine and which are very effective in teaching and training in

lectures such as EM Wave Theory, Antennas and Radiowave Propagation, EM Scattering and Diffraction, Guided Wave Theory, Microstrip Circuit Design, Radar Cross Section Prediction, Transmission Lines, Metamaterials, etc.

Prof. Dr. Levent Sevgi is a Fellow of the IEEE (since 2009) and the recipient of IEEE APS Chen-To Tai Distinguished Educator Award (2021). He received his B. Eng., M. Eng., and PhD degrees in Electronic Engineering from Istanbul Technical University (ITU) in 1982, 1984 and 1990, respectively. In 1987, while working on his PhD, he was awarded a fellowship that allowed him to work with Prof. L. B. Felsen at Weber Research Institute / New York Polytechnic University York for two years. His work at the Polytechnic concerned the propagation phenomena in non-homogeneous open and closed waveguides.

He was with Istanbul Technical University (1991–1998), TUBITAK-MRC, Information Technologies Research Institute (1999–2000), Weber Research Institute / NY Polytechnic University (1988–1990), Scientific Research Group of Raytheon Systems Canada (1998 – 1999), Center for Defense Studies, ITUV-SAM (1993 – 1998 and 2000–2002) and with University of Massachusetts, Lowell (UML) MA/USA as a full-time faculty (2012 – 2013), with DOGUS University (2001-2014) and with Istanbul OKAN University (2014 - 2021). He has been with Istanbul ATLAS University Since Sep 2022.

He has been an IEEE AP-S Distinguished Lecturer for the term 2020-2022. He served one-term in the IEEE AP-S AdCom (2013-2015) and one-term and as a member of IEEE AP-S Field Award Committee (2018-2019). He has been the writer/editor of the “Testing ourselves” Column in the IEEE AP Magazine (since Feb 2007), a member of the IEEE AP-S Education Committee (since 2006), He has also served in several editorial boards (EB) of other prestigious journals / magazines, such as the IEEE AP Magazine (since 2007), Wiley’s International Journal of RFMiCAE (2002-2018), and the IEEE Access (2017-2019 and 2020 - 2022). He is the founding chair of the EMC TURKIYE International Conferences (www.emcturkiye.org).

He has been involved with complex electromagnetic problems and complex communication and radar systems for nearly three decades. His research study has focused on propagation in complex environments; electromagnetic scattering and diffraction; RCS prediction and reduction; EMC/EMI modelling, simulation, tests and measurements; multi-sensor integrated wide area surveillance systems; surface wave HF radars; analytical and numerical methods in electromagnetics; FDTD, TLM, FEM, SSPE, and MoM techniques and their applications; bio-electromagnetics. He is also interested in novel approaches in engineering education, teaching electromagnetics via virtual tools. He also teaches popular science lectures such as Science, Technology and Society.

He has given dozens of seminars, invited/keynote talks, organized/presented several tutorials, training sessions and short courses from half-day to three-days in universities/institutes all around the World. He has published more than a dozen special issues / sections in many journals as a guest editor and/or a co-guest editor.

His recent keynote talks / distinguished lectures are: (i) From Engineering Electromagnetics towards Electromagnetic Engineering: Teaching, Training Next Generations, MIT Massachusetts Institute of Technology, Nov 9, 2021, MA-USA (ii) Radiowave Propagation Modeling and Simulation, University of Toronto, Oct 29, 2021, ON-CA, and (iii) Electromagnetic Diffraction Modeling and Simulation, University of Syracuse, Nov 11, 2021 NY-USA.

He has published many books/book chapters in English and Turkish, over 180 journal/magazine papers/tutorials and attended nearly 100 international conferences/symposiums. His three books Complex Electromagnetic Problems and Numerical Simulation Approaches, Electromagnetic Modeling and Simulation and Radiowave Propagation and Parabolic Equation Modeling were published by the IEEE Press - WILEY in 2003, 2014, and 2017, respectively. His fourth and fifth books, A Practical Guide to EMC Engineering (Sep 2017) and Diffraction Modeling and Simulation with MATLAB (Feb 2021) were published by ARTECH HOUSE.

His h-index is 37, with a record of more than 4750 citations (source: Google Scholar, Aug 2022).

Photonics Society – 7:00PM, Thursday, October 13

Advances in Flat Optics: From Metalenses to High-Volume Manufacturing for Consumer Electronics and Communications

Prof. Federico Capasso, Harvard University, Cambridge, MA



Since the demonstration of the generalized laws of refraction for metasurfaces[1] and the first high performance metalenses[2], metaoptics has rapidly progressed from the laboratory to manufacturing, propelled by the vision that the foundries that manufacture ICs will manufacture CMOS compatible flat optics using the same semiconductor technology based on deep-UV lithography.[3,4] This will impact the consumer electronics market in areas such as smart phones and wearable displays for AR/VR. Metasurfaces are now on the market through its partnership with STMicroelectronics, marking the introduction of this revolutionary optical technology in real-world devices. [5] I will also present advances in cm scale achromatic RGB metalenses for VR by inverse design[6] and 10 cm metalenses for space optics consisting of 20 billion metatoms.[7] A compact and highly integrated metasurface-based inverse designed mode multiplexer that takes three single-mode fiber inputs and converts them into the first three linearly polarized spatial modes of a few-mode fiber with high fidelity the C-band (1530–1565 nm) of fiber optics will be presented.[8] I will conclude with the report of hybrid silicon-organic electrooptic metasurface modulators that use Mie resonances for efficient electro-optic modulation at GHz speeds for free-space communications.[9]

1. Nanfang Yu, et al. *Science*, 334, 333 (2011)
2. Mohammadreza Khorasaninejad, et al. *Science*, 352, 1190 (2016)
3. Federico Capasso, *Nanophotonics*, 7, 953 (2018)
4. Alan She et al., *Optics Express*, 26, 1573 (2018)
5. <https://newsroom.st.com/media-center/press-item.html/t4458.html>; <https://www.metalenz.com>
6. Zhaoyi Li et al. *Nature Communications*, 13, 2409 (2022)
7. Joon-Suh Park et al. "All-Glass, Mass-Produced, Large-Diameter Metalens at Visible Wavelength for 100 mm Aperture Optics and Beyond" *CLEO 2022*
8. Jaewon Oh et al. *ACS Photonics* 9, 929 (2022)

9. Ileana-Cristina Benea-Chelms et al. *Nature Communications*, 13, 3170 (2022)

Federico Capasso is the Robert Wallace Professor of Applied Physics at Harvard University, which he joined in 2003 after a 27 years' career at Bell Labs where he did research, became Bell Labs Fellow and held several management positions including Vice President for Physical Research. His research has spanned a broad range of topics from applications to basic science in the areas of electronics, photonics, nanoscale science and technology including plasmonics, metamaterials and the Casimir effect. He is a co-inventor of the quantum cascade laser; he recently performed the first measurement of the repulsive Casimir force and has been involved in research on plasmonic metasurfaces aimed at engineering the wavefront of light. He is a member of the National Academy of Sciences, the National Academy of Engineering, a fellow of the American Academy of Arts and Sciences; his awards include the King Faisal Prize for Science, the APS Arthur Schawlow Prize, the IEEE Edison Medal, the Franklin Medal, the Berthold Leibinger Zukunftspreis (the future prize), the Julius Springer Prize for Applied Physics, the Jan Czocharlski Award of the European Material Research Society for lifetime achievements in Materials Science.

This meeting begins at 7 PM Thursday, October 13, 2022 and will be online only.

The registration link will be posted two days prior to the seminar.

After registering, you will receive a confirmation email containing information about joining the webinar. This webinar will take place on Zoom and will be started 15 minutes early (at 6:45 EDT) to allow for technical troubleshooting. The seminar will begin at 7:00PM. For more information contact Keisuke Kojima, IEEE Boston Photonics Society chair at keisukekojima@ieee.org, or visit the IEEE Boston Photonics Society website at www.bostonphotonics.org.

Location: Online Seminar

Directions: This meeting will take place online

Entrepreneurs' Networking – 6:00PM, Tuesday, October 18

Friends and Family and Other Seed Funding

Location: Cambridge Innovation Center, Cambridge, MA and Online

ENET is pleased to present this meeting and online webinar! Attendees will have the option to join us in-person at the Cambridge Innovation Center (CIC) in Kendall Square, Cambridge, MA or online via Zoom. Use the link below to pre-register!

Register Here: <https://bostonenet.org/events/essential-tips-for-startup-networking-and-communications/>

You want to start a company, but even if you forego your own salary, other startup expenses add up. Beyond your own savings, where do you go to get your first funding?

Some studies show that each year between 35-40% of startup ventures receive capital from friends and family. This can include not only your relatives but also neighbors, colleagues from work, social and sports clubs, teachers and classmates, from grade school right through to grad school, and others you've met on your life's journey. Some also call this varied investor group "friends, family, and fools" – because being the first in investors can be so risky to one's pocket book.

The October 18 ENET meeting will explore this important and often critical source of financing for startup company – do's and don'ts, tips and lessons learned, how best to prepare if you are now or will soon embark on your own effort to raise friends and family financing.

That night, we will begin with the "ask". How to approach friends and family on what can be a touchy subject – warming them up, feeling out financial ability and interest in possible investment. We move to using of the simple pitch deck, setting a clear value proposition and rehearsing your elevator pitch. Part of this will include determining your use of proceeds and the amount needed to take you to a series A or other funding. Then you will need to translate that into how much to seek per investor and setting a stage where you can

make a presentation and finally creating a cap table for your company.

Moving beyond that initial pitch to investors, you will need to know and our speakers will discuss your plan for what forms investment will take – whether equity, the form of equity, loans, convertible loans and how convertibility would work or gifts and if gifts what might be offered to those who might make a gift. Then you will need to plan out the documentation for investment which would take this includes setting out what you want to do, how you plan to do it and how you will use the money. Documentation would also include protecting yourself against future claims of misrepresentation by setting out challenges you face, risks of loss for investors and competition. As part of your planning, you will want to be sure to nothing that will harm your chances for later angel or VC financing... and we will cover that too.

Other speakers will address special issues involving biotech and life science companies and still other special issues involving intellectual property – both key protections you want to put into place for IP but also opportunities your IP can offer you.

Among our four speakers are active angel investors and serial entrepreneurs including experiences with both tech and life science startup companies they founded. The presentations will then be followed with a fireside chat, with audience and moderator questions for each of the speakers on the panel. There will be also be a half hour of post-meeting networking available to the attendees giving you the chance to meet the speakers and moderator.

More information

In-person Participation (check-in begins at 6:00 PM):
LOCATION: CIC, One Broadway, Cambridge, MA 01803.

TRANSPORTATION: Across the street from Kendall Square T station on the Red Line.

PARKING: Low flat rate parking available after 5pm.

REFRESHMENTS: Pizza will be served.

Online Participation: Zoom links will be sent to all registrants after registration.

COST AND RESERVATIONS: This event is free for ENET members, \$5 for CIC members and \$10 for non-members. ENET members will also have the opportunity to view a recording of this webinar if you are unable to attend or wish to view it again. Click [here](#) to learn how to become a member.

To expedite sign-in for the event, we ask that everyone — members as well as non-members — pre-register. Pre-registration is available until midnight the day before the meeting. If you cannot pre-register, you are welcome to register in person at the door while seats are available.

Agenda

6:00 – 7:00 PM Registration and Networking

7:00 - 7:10 PM - ENET Chairperson's announcements

7:10 - 7:25 PM – eMinute Pitch - Up to 3 Startup companies' presentations

7:25 - 8:10 PM - expert speakers on the night's topic

8:10 - 8:30 PM – Moderator and Audience Q & A with the speakers

8:30 – 9:00 PM - Networking – your chance to “meet” our three speakers and moderator

(all times are USA Eastern Daylight time)

Register Here: <https://bostonenet.org/events/essential-tips-for-startup-networking-and-communications/>

Speakers:



Sal Daher, CFA, Active Angel Investor

Sal is an angel investor helping academic founders bring their biotechnologies to market. He looks for platform technologies that are proprietary and have the potential of enabling strategic players in existing businesses. Sal studied engineering at MIT and Stanford but worked in international finance for decades. Since the early 1990s he has invested in more than seventy technology ventures. He is on the board of Savran Technologies, a biotech specializing in ultra-rare cells.

<https://www.linkedin.com/in/sal-daher-cfa-3354a05/>

J. Peter Fasse - Principal at Fish & Richardson P.C.



Peter also has experience in opposing and defending patents in U.S. litigation and post-grant proceedings and before the European Patent Office. Peter has experience in various fields including medical therapeutics, diagnostics, devices, imaging, microfluidic systems, nucleic acid sequence analysis systems and software, molecular biology, complex biomedical systems, optics, machine tools, RNAi and CRISPR therapeutics, dendritic cell- and DNA- based vaccines, liquid biopsy, engineered AAV systems, next generation sequence analysis, nanoparticle and vector-based delivery, cell culturing and bioprocessing, optics, and lasers.

<https://www.linkedin.com/in/peter-fasse-2207911/>



Lisa Frusztajer, Active Angel Investor.

Lisa is an active early stage investor focusing on companies led by under-represented founders. Lisa got her start in the field as a Pipeline Fellow, an LP with Converge Venture Partners and as a Lead Partner with the Portfolia Enterprise Fund.

She also invests independently. Lisa is currently Investor in Residence at The Capital Network (TCN), where she built a mentorship program, works on organizational and fundraising strategy and speaks frequently on the founder journey. Lisa is a certified coach who helps founders overcome obstacles to growing their businesses and becoming effective leaders. Lisa spent most of her career in technology, working in marketing, finance, engineering and project management. She has served on non-profit boards, mainly for educational institutions, and currently chairs the board for a Cape Cod library. Lisa studied Russian Literature, Soviet and Russian Politics, and Finance, and holds degrees from the University of Chicago, London School of Economics and Columbia Business School.

<https://www.linkedin.com/in/lisa-frusztajer-518a388/>



Ulrik B. Nielsen, Ph.D. is a serial life science entrepreneur and company founder. Ulrik was co-founder and CEO of Tidal Therapeutics which was acquired by Sanofi in 2021. He serves on the boards of Alloy, Merrimack, Unikum, and Notch Therapeutics. He was previously co-founder, President and CEO of Torque (now Repertoire Immune Medicines) from 2015 until 2018. Prior to Torque, Ulrik was

co-founder and CSO of Merrimack (NASDAQ: MACK) until 2015. Ulrik trained at University of California, San Francisco and MIT, and holds a Ph.D. in molecular biology from the University of Copenhagen.
<https://www.linkedin.com/in/ulrikbjerlnielsen/>

Organizer and Moderator



Robert A. Adelson, Principal, Business and Tax attorney @ Adelson & Associates, LLC. Chair Emeritus @ Boston Entrepreneurs' Network (ENET).

Rob has been an attorney for over 30 years specialized in business, tax, stock and options, employment, contracts, financing, trademarks and intellectual property. Rob began as an associate at major New York City law firms before returning home to Boston in 1985 where he has since been a partner in small and medium sized firms before joining Engel & Schultz LLP where he was a partner from 2004 to 2019. When the senior partners retired, he moved his law practice to his own firm, effective 1/1/2020. Rob represents entrepreneurs, startups and small companies, independent contractors and employees and executives. Rob is a frequent speaker on business law topics and author of numerous articles published in Boston Business Journal, Mass High Tech and other publications, plus more than thirty articles since 2016 on executive employment topics published by CEOWorld magazine. He has been named among

the "Top 20 Boston Startup Lawyers" by ChubbyBrain.com, a website that provides tools for entrepreneurs. Rob has been on the ENET Board since 2002, was Vice Chair 2005-2009, and ENET Chairman 2009-2019. He was also a Co-Founder and Board member of the 128 Innovation Capital Group (2004 -2015). In 2016, he received the IEEE USA Professional Achievement award for "extreme dedication to the entrepreneurship community." He holds degrees from Boston University, B.A., summa cum laude, Northwestern University (Chicago), J.D., Law Review, and New York University, LL.M. in Taxation.

<https://www.linkedin.com/in/robert-adelson-b8a1557/>
www.executiveemploymentattorney.com

Register Here: <https://bostonenet.org/events/essential-tips-for-startup-networking-and-communications/>

Venue Sponsor:



CIC believes in the entrepreneur. We recognize that invention propels innovation, density spurs collaboration, and a shared purpose drives a thriving community. CIC provides a home from which to work, allowing innovators to easily access resources and create substantive, positive global impact. Request to chat with a workspace expert about CIC's flexible workspace offering, or try out a complimentary, one-time day of coworking.

IEEE Boston Section Social Media Links:

Twitter: <https://twitter.com/ieeeboston>

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YouTube: <https://www.youtube.com/user/IEEEBostonSection>

LinkedIn: <https://www.linkedin.com/groups/IEEE-Boston-Section-3763694/about>

Power & Energy Society – 6:00PM, Wednesday, October 19

Big Changes in the Power Industry: Highlights of What is Coming

Speaker: Chris Root, President of US National Committee of CIGRE, CIGRE USNC

Come and join us for an evening of fun and networking!!! First In-person IEEE PES Boston Event After Two Years!

Featuring: Buffet style dinner, cash bar and live music

Time: Pre-dinner drinks at 6:00 pm, program commences at 6:30 pm

Location: Embassy Suites Boston-Waltham 550 Winter Street Waltham, MA 02451

Registration Details: Price: \$55 per person || \$430 per table of 8 || \$25 per student.

Online Registration: <https://www.eventbrite.com/e/419684225817> *A small convenience fee will apply to online ticket transactions.

Checks are also acceptable.

Please make the check payable to IEEE PES Boston Chapter and mail it to: Jack Martin, IEEE PES Boston Treasurer 50 Church Street, Westwood, MA 02090

Registration Closing: Date and Time: 3 PM on Monday Oct 17, 2022

Visit IEEE PES Boston Chapter's website for details! <https://site.ieee.org/boston-pes/>

Call for Course Speakers/Organizers

IEEE's core purpose is to foster technological innovation and excellence for the benefit of humanity. The IEEE Boston Section, its dedicated volunteers, and over 8,500 members are committed to fulfilling this core purpose to the local technology community through chapter meetings, conferences, continuing education short courses, and professional and educational activities.

Twice each year a committee of local IEEE volunteers meet to consider course topics for its continuing education program. This committee is comprised of practicing engineers in various technical disciplines. In an effort to expand these course topics for our members and the local technical community at large, the committee is publicizing this CALL FOR COURSE SPEAKERS AND ORGANIZERS.

The Boston Section is one of the largest and most technically diverse sections of the IEEE. We have over 20 active chapters and affinity groups.

If you have an expertise that you feel might be of

interest to our members, please submit that to our online course proposal form on the section's website (www.ieeeboston.org) and click on the course proposal link (direct course proposal form link is

<http://ieeeboston.org/course-proposals/> . Alternatively, you may contact the IEEE Boston Section office at ieeebostonsection@gmail.com or 781 245 5405.

- **Honoraria can be considered for course lecturers**
- Applications oriented, practical focused courses are best (all courses should help attendees expand their knowledge based and help them do their job better after completing a course)
- Courses should be no more than 2 full days, or 18 hours for a multi-evening course
- Your course will be publicized to over 10,000 local engineers
- You will be providing a valuable service to your profession
- Previous lecturers include: Dr. Eli Brookner, Dr. Steven Best, Colin Brench, to name a few.

Computer Society and GBC/ACM – 7:00PM, Thursday, October 20

KUtrace: Where Does Every Nanosecond go in Complex Latency-sensitive Software?

Richard L. Sites, ex-DEC

Register in advance for this webinar at:

https://acm-org.zoom.us/webinar/register/6316631329041/WN_XKN5R8FUSR6w3DC-Qk7a3Jg

After registering, you will receive a confirmation email containing information about joining the webinar.

Observation tools for understanding occasionally-slow performance in large-scale distributed transaction systems are not keeping up with the complexity of the environment. The same is true for large database systems, real-time control systems, and operating systems themselves.

KUtrace is a low-overhead tracing tool that reveals the true execution and non-execution (waiting) dynamics of such software, running in situ with live traffic. It is based on small FreeBSD or Linux kernel patches recording and timestamping every transition between kernel- and user-mode execution across all CPUs. The resulting postprocessed display shows exactly what each action/response is doing every nanosecond, and hence shows the root cause(s) for unpredictably-slow responses, including interference between programs. Tracing overhead is well under 1%.

Even without a similar observation tool for GPU execution, CPU-only tracing shows GPU delays and CPU-GPU interaction delays. The net result is deep insight

into the dynamics of complex software, leading to often-simple changes to improve performance.

Dr. Richard L. Sites wrote his first computer program in 1959 and has spent most of his career at the boundary between hardware and software, with a particular interest in CPU/ software performance. His past work includes VAX microcode, DEC Alpha co-architect, and inventing the performance counters found in nearly all processors today. He has done low-overhead microcode and software tracing at DEC, Adobe, Google, and Tesla. Dr. Sites earned his PhD at Stanford in 1974; he holds 66 patents and is a member of the National Academy of Engineering. His book *Understanding Software Dynamics* was published by Addison-Wesley in late 2021.

This joint meeting of the Boston Chapter of the IEEE Computer Society and GBC/ACM will be online only due to the COVID-19 lockdown.

Up-to-date information about this and other talks is available online at <https://ewh.ieee.org/r1/boston/computer/>. You can sign up to receive updated status information about this talk and informational emails about future talks at <https://mailman.mit.edu/mailman/listinfo/ieee-cs>, our self-administered mailing list.

Nuclear & Plasma Sciences and Social Implications of Technology Societies (co-sponsored by BU IEEE-HKN) – 7:00PM, Wednesday, October 26

Plasma Based Green Technologies

Speaker: Professor Min-Chang Lee, ECE Department, Boston University

Location: Photonics Building, ECE Department, Boston University, via zoom meeting:

To Register:

<https://events.vtools.ieee.org/m/325551>

Research and teaching some “Plasma Green Energy Technologies” at Boston University will be discussed. The addressed work is a portion of our integrated research and academic programs established at Boston University, including plasma photonics and nanotechnology, plasma medicine, spacecraft propulsion, solar and plasma fusion as green energy sources and technologies. The focused discussion will center on electromagnetic wave-plasma interactions applicable to plasma fusion and solar powered microwave transmissions systems as well as generation of surface plasma modes in gaseous plasmas. These academic and research activities are highlighted in our IEEE paper entitled “Teaching and Research on Plasma Based Green Technologies and Some Environmental Issues”

by Min-Chang Lee, published in Proceedings of 2019 IEEE International Symposium on Technology and Society (ISTAS 2019), ISBN: 978-1-7281-5480-0.

Professor Min-Chang Lee has been teaching and conducting research in the Department of Electrical & Computer Engineering at Boston University (BU) since 1991. He has developed an integrated educational and research program at Boston University in plasma-based green technologies, including theoretical study, experiments, and laboratory simulation experiments. Professor Lee is the current Chair of Nuclear and Plasma Science Society (NPSS), Chair of Society on Social Implications of Technology in IEEE Boston Section, and Faculty Advisor of BU IEEE-HKN.

Location: Photonics Building, ECE Department, Boston University, via zoom meeting:

To Register: <https://events.vtools.ieee.org/m/325551>

Call for Articles

Now that the Reflector is all electronic, we are expanding the content of the publication. One of the new features we will be adding are technical, professional development, and general interest articles to our members and the local technology community. These will supplement the existing material already in our publication.

Technical submissions should be of reasonable technical depth and include graphics and, if needed, any supporting files. The length is flexible; however, a four to five page limit should be used as a guide. An appropriate guide may be a technical paper in a conference proceeding rather than one in an IEEE journal or transaction.

Professional development or general interest articles should have broad applicability to the engineering community and should not explicitly promote services for which a fee or payment is required.

A maximum length of two to three pages would be best.

To ensure quality, technical submissions will be reviewed by the appropriate technical area(s). Professional/interest articles will be reviewed by the Publications Committee for suitability. The author will be notified of the reviewers' decision.

The Reflector is published the first of each month. The target submission deadline for the articles should be five weeks before the issue date (e.g., June 1st issue date; article submission is April 27). This will allow sufficient time for a thorough review and notification to the author.

We are excited about this new feature and hope you are eager to participate!

Submissions should be sent to;
ieeebostonsection@gmail.com

2022 IEEE International Symposium on Phased Array Systems and Technology

Revolutionary Developments in Phased Arrays



11–14 October 2022
The Westin Waltham Boston
Waltham, Massachusetts, USA



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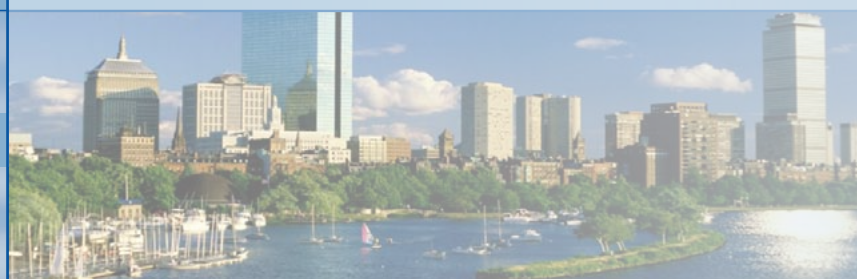
BAE SYSTEMS



Technical



Media



Conference Registration

see www.array2022.org for details

About the Symposium

Phased array systems continue to be a rapidly evolving technology with steady advances motivated by the challenges presented to modern military and commercial applications. This symposium will present the most recent advances in phased array technology and present a unique opportunity for members of the international community to interact with colleagues in the field of Phased Array Systems and Technology.

Note: there will be a virtual component of the conference to accommodate potential travel restriction or concerns due to COVID19

Plenary Speakers

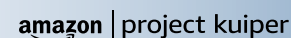
- Alfonso Farino – Consultant to Leonardo S.p.A.
- Tom Dalrymple – Air Force Research Laboratory Sensors Directorate
- Gabriel Rebeiz – University of California San Diego
- Robert Palmer – Oklahoma University Advanced Radar Research Center
- Israel Lupa – Elta
- Ellen Ferraro – Raytheon

Special Sessions

- European Phased-Arrays Systems and Technology
- Low Frequency Arrays
- Intelligent Arrays
- SATCOM Arrays
- Weather Arrays
- Wideband 3D-Integrated mmWave Array Tiles

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IEEE Boston Section is the largest, most active, and technically diverse section in the U.S. Comprised of Engineers, scientists and professionals in the electrical and computer sciences and engineering industry

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- Courses should be no more than 2 full days, or 18 hours for a multi-evening course
- Your course will be publicized to over 10,000 local engineers
- You will be providing a valuable service to your profession
- Previous lecturers include: Dr. Eli Brookner, Dr. Steven Best, Colin Brench, to name a few.

Digital Signal Processing (DSP) for Software Radio

Dates & Times: Live Workshops: 1:00 - 2:30PM EST; Saturdays, Jan. 28, Feb. 4, 11, 18, 25
First Video Release, January 21, 2023, additional videos released weekly in
advance of that week's live session!

Speaker: Dan Boschen

Location: Zoom

Course Information will be distributed on Wednesday, January 21, 2023 in advance of and in preparation for the first live workshop session.

Attendees will have access to the recorded session and exercises for two months (until April 25) after the last live session ends!

This is a hands-on course providing pre-recorded lectures that students can watch on their own schedule and an unlimited number of times prior to live Q&A/Workshop sessions with the instructor. Ten 1.5 hour videos released 2 per week while the course is in session will be available for up to two months after the conclusion of the course.

Course Summary This course builds on the IEEE course "DSP for Wireless Communications" also taught by Dan Boschen, further detailing digital signal processing most applicable to practical real-world problems and applications in radio communication systems. Students need not have taken the prior course if they are familiar with fundamental DSP concepts such as the Laplace and Z transform and basic digital filter design principles.

This course brings together core DSP concepts to address signal processing challenges encountered in radios and modems for modern wireless communications. Specific areas covered include carrier and timing recovery, equalization, automatic gain control, and considerations to mitigate the effects of RF and channel distortions such as multipath, phase noise and amplitude/phase offsets.

Dan builds an intuitive understanding of the underlying mathematics through the use of graphics, visual demonstrations, and real-world applications for mixed signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges, rather than a tutorial on implementations with DSP processors.

Now with Jupyter Notebooks! This long-running IEEE Course has been updated to include Jupyter Notebooks which incorporates graphics together with Python simulation code to provide a "take-it-with-you" interactive user experience. No knowledge of Python is required but the notebooks will provide a basic framework for proceeding with further signal processing development using that tools for those that have interest in doing so.

This course will not be teaching Python, but using it for demonstration. A more detailed course on Python itself is covered in a separate IEEE Course routinely taught by Dan titled "Python Applications for Digital Design and Signal Processing".

All set-up information for installation of all tools used will be provided prior to the start of class.

Target Audience: All engineers involved in or interested in signal processing for wireless communications. Students should have either taken the earlier course "DSP for Wireless Communications" or have been sufficiently exposed to basic signal processing concepts

if you are uncertain about your background or if you would like more information on the course.

Benefits of Attending/ Goals of Course:

Attendees will gain a strong intuitive understanding of the practical and common signal processing implementations found in modern radio and modem architectures and be able to apply these concepts directly to communications system design.

Topics / Schedule:

Class 1: DSP Review, Radio Architectures, Digital Mapping, Pulse Shaping, Eye Diagrams

Class 2: ADC Receiver, CORDIC Rotator, Digital Down Converters, Numerically Controlled Oscillators

Class 3: Digital Control Loops; Output Power Control, Automatic Gain Control

Class 4: Digital Control Loops; Carrier and Timing Recovery, Sigma Delta Converters

Class 5: RF Signal Impairments, Equalization and Compensation, Linear Feedback Shift Registers

Speaker's Bio:

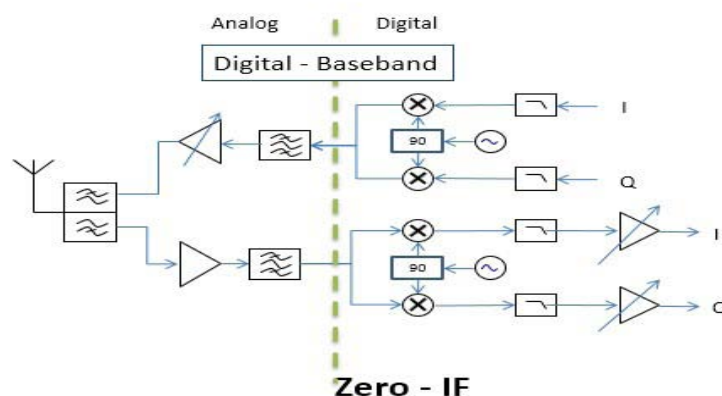
Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing and developing transceiver hardware from baseband to antenna for wireless communications systems and has taught courses on DSP to international audiences for over 15 years. Dan is a contributor to Signal Processing Stack Exchange <https://dsp.stackexchange.com/>, and is currently at Microchip (formerly Microsemi and Symmetricom) leading design efforts for advanced frequency and time solutions.

**Decision (Run/Cancel) Date for this Course is
Monday, January 16, 2023**

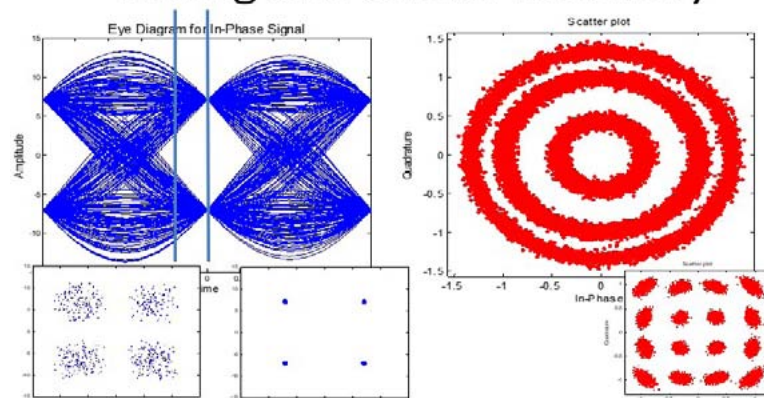
IEEE Members	\$190
Non-members	\$210

For more background information, please view Dan's Linked-In page at: <http://www.linkedin.com/in/dan-boschen>

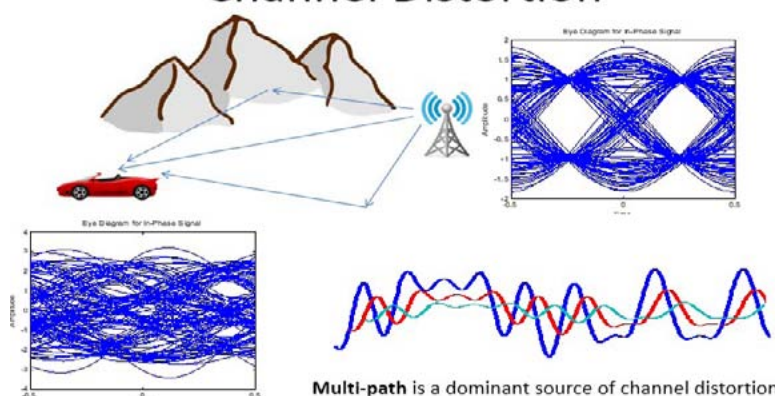
Radio Architectures



Timing and Carrier Recovery



Channel Distortion



DSP for Wireless Communications

Dates & Times: Live Workshops: 1:00 - 2:30PM ET, Saturdays, Oct. 22, 29, Nov. 5, 12, 19
First Video Release, October 15, 2022, additional videos released weekly in advance of that week's live session!

Speaker: Dan Boschen

Location: Zoom Webinar

**Last Notice Before Course Begins,
Please Register Now!!!**

New Format Combining Live Workshops with Pre-recorded Video - This is a hands-on course providing pre-recorded lectures that students can watch **on their own schedule** and an **unlimited number of times** prior to live Q&A/Workshop sessions with the instructor. Ten 1.5 hour videos released 2 per week while the course is in session will be available for up to two months after the conclusion of the course...until January 19, 2023.

Course Summary

This course is a fresh view of the fundamental and practical concepts of digital signal processing applicable to the design of mixed signal design with A/D conversion, digital filters, operations with the FFT, and multi-rate signal processing. This course will build an intuitive understanding of the underlying mathematics through the use of graphics, visual demonstrations, and applications in GPS and mixed signal (analog/digital) modern transceivers. This course is applicable to DSP algorithm development with a focus on meeting practical hardware development challenges in both the analog and digital domains, and not a tutorial on working with specific DSP processor hardware.

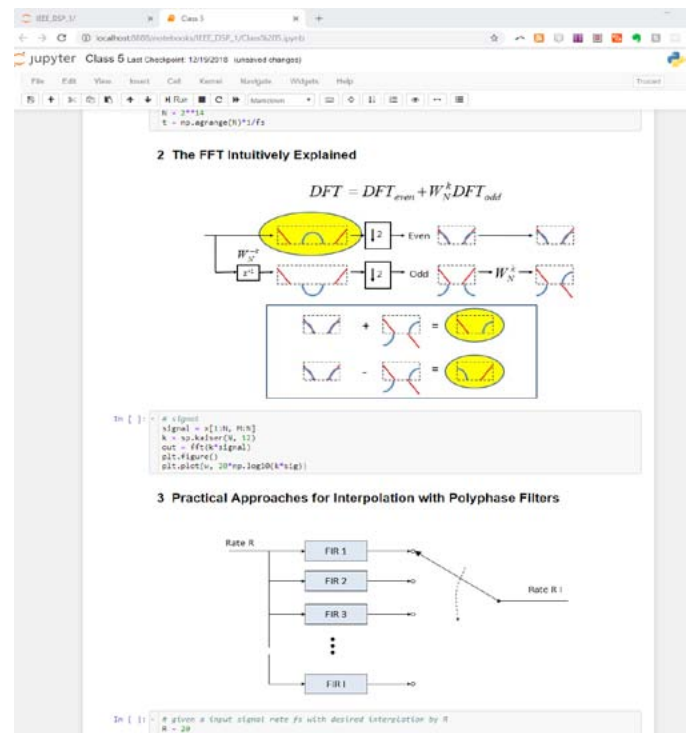
Now with Jupyter Notebooks!

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This course will not be teaching Python, but using it for demonstration. A more detailed course on Python itself

is covered in a separate IEEE Course "Python Applications for Digital Design and Signal Processing".

Students will be encouraged but not required to load all the Python tools needed, and all set-up information for installation will be provided prior to the start of class.



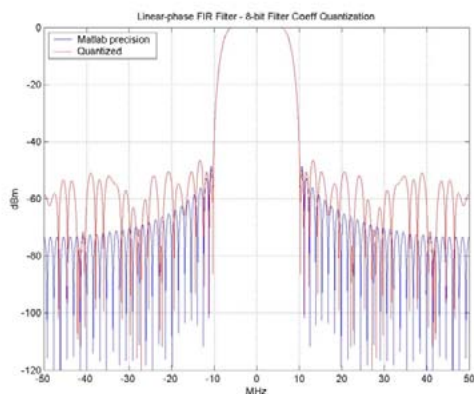
Target Audience:

All engineers involved in or interested in signal processing applications. Engineers with significant experience with DSP will also appreciate this opportunity for an in-depth review of the fundamental DSP concepts from a different perspective than that given in a traditional introductory DSP course.

Benefits of Attending/ Goals of Course:

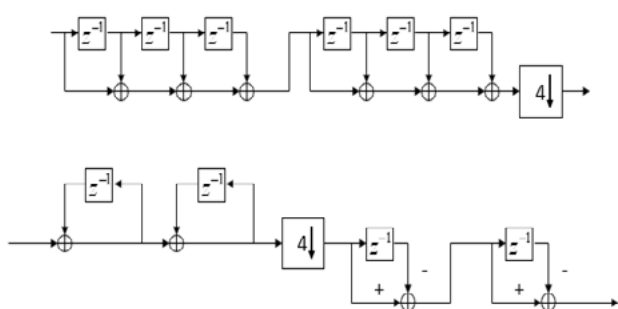
Attendees will build a stronger intuitive understanding of the fundamental signal processing concepts involved

Linear Phase FIR Filter (8-bit quantized filter coefficients)



with digital filtering and mixed signal analog and digital design. With this, attendees will be able to implement more creative and efficient signal processing architectures in both the analog and digital domains. The knowledge gained from this course will have immediate practical value for any work in the signal processing field.

Multi-stage CIC

**Topics / Schedule:**

Class 1: Correlation, Fourier Transform, Laplace Transform

Class 2: Sampling and A/D Conversion, Z –transform, D/A Conversion

Class 3: IIR and FIR Digital filters, Direct Fourier Transform

Class 4: Windowing, Digital Filter Design, Fixed Point vs Floating Point

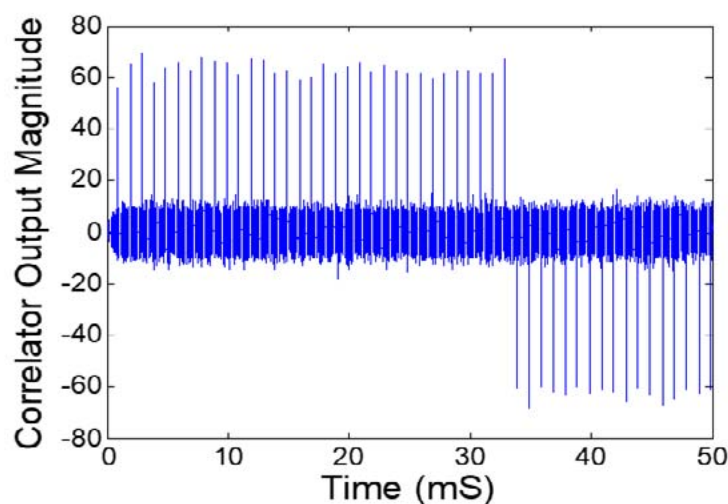
Class 5: Fast Fourier Transform, Multi-rate Signal Processing, Multi-rate Filters

Speaker's Bio:

Dan Boschen has a MS in Communications and Signal Processing from Northeastern University, with over 25 years of experience in system and hardware design for radio transceivers and modems. He has held various positions at Signal Technologies, MITRE, Airvana and Hittite Microwave designing and developing transceiver hardware from baseband to antenna for wireless communications systems. Dan is currently at Microchip (formerly Microsemi and Symmetricom) leading design efforts for advanced frequency and time solutions.

For more background information, please view Dan's Linked-In page at: <http://www.linkedin.com/in/dan-boschen>

Sliding Correlation



**Decision (Run/Cancel) Date for this Course is
monday, october 10, 2022**

IEEE Members	\$190
Non-members	\$210

https://ieeeboston.org/event/digital-signal-processing-webinar/?instance_id=3297

Practical RF PCB Design, Wireless Networks, Products and Telecommunications

Time & Date: 9:00AM - 4:30PM, Wednesday & Thursday, January 4 & 5, 2023
(13 hours of instruction!)

Speaker: Henry Lau, Lexiwave Technology

Location: Crowne Plaza Hotel, 15 Middlesex Canal Park Road, Woburn, MA

Overview: One of the most demanding consumer products in the market is the wireless telecommunication product. A well-designed Radio Frequency Printed Circuit Board (RF PCB) contributes significantly to the success of any wireless product as the layout of the PCB greatly affects the performance, stability and reliability of the product. In today's highly competitive wireless products market with increasingly compressed development time-frame, there is a strong demand for RF professionals who possess the knowledge and experience to design top-performing RF PCBs in less number of iterations. What matters is whether your level of competence is up to the required standard to meet such demand.

Audience: RF Designers, Wireless Product Designers, Field Application Engineers, Design Managers and related professionals.

Benefits: This course aims to provide participants with an insightful training on RF PCB design from a practical, industrial perspective. Participants will be led through a systematic, theoretical presentation with case studies on commercial products in the training. The course will be conducted by an RF expert with rich industrial experience. It is suitable for RF professionals who want to keep up-to-date their skills and knowledge in RF PCB design and stay competitive.

OUTLINE

1. Printed circuit board design for RF circuits

From product design, circuit design to PCB design
Layer stack-up assignment
Grounding methods and techniques
Interconnects and I/O
Bypassing and decoupling
Partitioning methods

2. Printed circuits board design for other circuits

Clock circuits
Base-band circuits
Audio circuits
Power supplies
Impedance-controlled circuits

3. PCB design for EMC/EMI compliance

EMC/EMI compliance
Grounding methods
Decoupling methods
Shielding methods

4. Additional Design Techniques

Production concerns
Systematic product design approach
RF Modules
Evaluation boards
Other RF concerns
Casing design

5. Case studies

Expertise:

Henry Lau received his M.Sc. and MBA degrees from UK and USA respectively. He has more than 25 years of experience in designing RF systems, products and RFICs in both Hong Kong and US. He worked for Motorola and Conexant in US as Principal Engineer on developing RFICs for cellular phone and silicon tuner applications. Mr Lau holds five patents all in RF designs. He is currently running Lexiwave Technology, a fables semiconductor company in Hong Kong and US designing and selling RFICs, RF modules and RF solutions. He has also been teaching numerous RF-related courses internationally.

*notes, lunch and coffee breaks
included with registration*

**Decision (Run/Cancel) Date for this Courses is
Friday, December 27, 2022**

Payment received by Dec. 23

IEEE Members \$415

Non-members \$445

Payment received after Dec. 23

IEEE Members \$445

Non-members \$465

https://ieeeboston.org/event/practical-rf-pcb-design/?instance_id=3308

Additional Courses Planned for later in 2023

Python for Signal Processing and Digital Design – April 1, 2023

DSP for Wireless Communications – July 22, 2023

DSP for Software Radio – October 14, 2023

Look in future Reflector issues and our website for more details

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