

IEEE AP-S DL Workshops Tour Northern Europe & USA

Dr. Levent Sevgi

Istanbul Technical University (Retired)
IEEE AP-S DLPC Chair (2024-2026)
IEEE AP-S DL (2020-2023)
Email: lsevgi@ieee.org



The third long and successful tour within the IEEE Antennas and Propagation Society (AP-S) Distinguished Lecturer (DL) Program included 7 cities/universities in Norway, Sweden, Finland, and USA, and was between Sep 20 - Oct 10, 2026.

On Monday, Sep. 21, 2026, **Oslo Metropolitan University** (OsloMet), Norway, hosted the first one. The organization and coordination of the workshop in Oslo was led by Prof. Jianhua Zhang and supported by Profs. Bernt Andre Brodtkorb and Lothar Fritsch, all from OsloMet. The three lectures are introduced briefly as follows:

◆ **Computational Electromagnetics:**

Prof. Özlem Özgün, IEEE AP-S DL from Hacettepe University, Turkey, delved into the computational electromagnetics (CEM), with emphasis on advanced methods (including AI, machine learning and digital twins) for modeling and analyzing complex electromagnetic problems that go beyond traditional numerical and simulation methods.



◆ **Electromagnetic Scattering and Diffraction:**

Prof. Levent Sevgi, IEEE Fellow and the former IEEE AP-S DL, from Istanbul Technical University, Turkey, delivered a talk entitled “Electromagnetic scattering and diffraction modeling and simulation”. He outlined the contemporary electromagnetic engineering and stressed the importance of educating the young talents in the interdisciplinary field.



◆ **Number of Spatial Degrees of Freedom:**

Prof. Mats Gustafsson, former IEEE AP-S DL (Lund University, Sweden) discussed a key theoretical problem in electromagnetic system and illustrated the importance of analytical approach to finding the number of spatial degrees of freedom (NDoF), which quantifies the fundamental limits of an electromagnetic system.



Here is the report of Prof. Zhang: <https://lnkd.in/dM3Q9yc6>. Here is the link for a 3min videoclip of the Oslo workshop: <https://lnkd.in/dF5uFFNe>

On September 23, 2026, **Chalmers University of Technology** and the WITECH Competence Centre hosted the second one, the Gothenburg workshop, organized by the Antenna Systems Group at Chalmers and the IEEE Sweden Section Joint MTT/AP Chapter, under the local leadership of Professor Marianna Ivashina. The speakers and their presentations were:

◆ **Computational Electromagnetics: From Basics to Mastery:** Prof. Özlem Özgün, IEEE AP-S DL (Hacettepe University, Türkiye) introduced the foundations of computational

electromagnetics and discussed the methods used to formulate and solve increasingly complex electromagnetic problems. Her lecture connected fundamental concepts with the practical considerations involved in developing reliable numerical models.

◆ **Electromagnetic Scattering & Diffraction Modeling and Simulation:** Prof. Levent Sevgi, IEEE Fellow, IEEE AP-S Former DL (Istanbul Technical University, Türkiye) examined the modeling and simulation of electromagnetic scattering and diffraction. He discussed the physical interpretation of these phenomena and the analytical and computational tools used to study how waves interact with objects and their surroundings.

◆ **How Many Spatial Degrees of Freedom Are There? From Antennas and Near-Field Communications to Imaging and Computation:** Prof. Mats Gustafsson, IEEE AP-S Former DL (Lund University, Sweden) explored the number of independent spatial channels that electromagnetic fields can support. His lecture connected this fundamental question with antenna systems, near-field communications, imaging, and computational methods.

◆ **Metamaterials and Composites: Electromagnetic Description and Unexpected Effects:** Prof. Ari Sihvola, IEEE AP-S DL (Aalto University, Finland) discussed the electromagnetic description of metamaterials and composite media. He explained how material composition and structure can produce effective properties and wave phenomena that may appear counterintuitive when viewed from the perspective of conventional materials.



◆ **Physics-oriented Statistical Wave Analysis Integrating Order and Chaos:** Assoc. Prof. Zhen Peng, IEEE AP-S DL (University of Illinois Urbana-Champaign, USA) presented a physics-oriented approach to statistical wave analysis. His lecture considered how deterministic structure and chaotic wave behavior can be treated within a common framework for analyzing complex electromagnetic environments.



Here is the link for a 3min videoclip of the Gothenburg workshop: <https://lnkd.in/daixPycu>.

The third workshop was at **KTH - Royal Institute of Technology**, School of EE & CS, Sweden, on September 25, 2026, and was co-organized by IEEE Sweden Section Jt AP-S / MTT-S Chapter and hosted by Prof. Oscar Quevedo-Teruel. It was the first ever DL workshop in Northern Europe with 7 distinguished lecturers, all from IEEE AP Society:

◆ **Ray Tracing for Antenna Modelling: Balancing Accuracy & Speed:** Prof. Oscar Quevedo-Teruel, KTH Royal Institute of Technology, - Sweden



◆ **How Many Spatial Degrees of Freedom Are There? From Antennas and Near-Field Communications to Imaging and Computation:** Prof. Mats Gustafsson, Lund University, Sweden

◆ **Scientific Machine Learning for EM Field Computations:** Prof. Costas Sarris, University of Toronto, Canada



◆ **Electromagnetic Diffraction Modeling and Simulation:** Prof. Levent Sevgi, Istanbul Technical University (ITU), Türkiye

◆ **Decomposition Methodology for Solving Maxwell Equations at Scale:** Prof. Zhen Peng, University of Illinois Urbana-Champaign (UIUC), USA.

◇ **The Fascinating World of Lorenz-Mie Scattering:** Prof. Ari Sihvola, Aalto University, Helsinki - Finland

◇ **Computational Electromagnetics: From Basics to Mastery:** Prof. Ozlem Ozgun, Hacettepe University, Ankara - Türkiye

Here is a 3.5min video of the day: <https://lnkd.in/dJfwMxftp>

The fourth workshop was in **Oulu University**, Finland. The Centre for Wireless Communication (CWC) and 6G Flagship hosted the Workshop. The local organization of this one-day program was coordinated by Prof. Jack Soh and Adj. Prof. Pekka Kyösti, with the support of the staff from CWC and 6G Flagship, and students from the IEEE Student Branch Oulu. The event is technically sponsored by the IEEE Finland AP/ED/MTT Chapter and sponsored by the PLM Group. Five speakers and their lectures are:

◇ **Metamaterials and Composites: Electromagnetic Description and Unexpected Effects:** Prof. Ari Sihvola from Aalto University, Finland, in this segment the variety of ways how one is able to characterize the macroscopic dielectric and magnetic behavior of composite materials with given properties of the constituents and the geometrical microstructure.

◇ **Magic World of Transformation Electromagnetics: Invisibility and Beyond:** Prof. Ozlem Ozgun from Hacettepe University, Türkiye, delved into the transformation electromagnetics (TEM), with particular emphasis on clarify the underlying physics and design principles. This was followed by the presentation of a set of representative and surprising applications that highlight the versatility of transformation-based approaches in both electromagnetics and computation.

◇ **Non-Hermitian Electromagnetics and Its Applications:** Prof. Pai-Yen Chen from the University of Illinois Chicago, presented non-Hermitian physics and its unique singularities have redefined wave engineering, which has facilitating breakthroughs in signal generation, routing, and sensing. This includes a discussion of its recent advancements and applications in the RF and microwave domains.



◇ **How Many Spatial Degrees of Freedom Are There? From Antennas and Near-Field Communications to Imaging and Computation:** Prof. Mats Gustafsson from Lund University, Sweden, lectured on a topic about the spatial degrees of freedom, which relates to how much independent information can be transmitted, received, or represented by an electromagnetic system. It also reviews fundamental results on spatial degrees of freedom and introduces an analytical approach for estimating the NDoF between arbitrarily shaped transmitting and receiving regions.

◇ **Electromagnetic Wave Propagation: Modelling and Simulation:** Prof. Levent Sevgi from Istanbul Technical University, Türkiye, focused on electromagnetic wave propagation for medium and long-range communication as well as radar systems. Besides that, he also presented a numerical propagation tool that calculates path losses between any two points marked on their digital maps which account various EM effects, such as, the irregular terrain

profile, the vegetation, the Earth's curvature, the atmospheric refractivity, the presence of buildings, cars, and other obstacles, etc.

Here is a short video of the Oulu Workshop: <https://lnkd.in/ddnCNta6>. The whole workshop was recorded for those who would like to watch it: <https://lnkd.in/eD6b9YHy>

The fifth workshop was in **Aalto University**, School of Engineering, Espoo, Finland, on September 30, 2026, hosted by Prof. Ari Sihvola, with the following four DLs:

◇ **Computational Electromagnetics: From Basics to Mastery**; Prof. Ozlem Ozgun, IEEE SM, IEEE AP-S DL, Hacettepe University, Ankara - Türkiye

◇ **From Engineering Electromagnetics to Electromagnetic Engineering**: Teaching, Training Next Generations: Prof. Levent Sevgi, IEEE Fellow, IEEE AP-S DL, Istanbul Technical University (ITU), Türkiye

◇ **How Many Spatial Degrees of Freedom Are There?** From Antennas and Near-Field Communications to Imaging and Computation: Prof. Mats Gustafsson, IEEE Fellow, IEEE AP-S DL, Lund University, Sweden

◇ **Ray Tracing for Antenna Modelling: Balancing Accuracy and Speed**: Oscar Quevedo-Teruel, IEEE Fellow, IEEE AP-S DL, KTH Royal Institute of Technology, Stockholm - Sweden

◇ **Metamaterials and Composites: Electromagnetic Description and Unexpected Effects**: Prof. Ari Sihvola, IEEE Fellow, IEEE AP-S DL, Aalto University, Helsinki - Finland

◇ **From Metamaterials to Metasurfaces and Metadevices**: Prof. Pai-Yen Chen, IEEE Fellow, IEEE AP-S DL, University of Illinois, Chicago, USA

Here is the link for a short video from Helsinki workshop: <https://lnkd.in/drG9aM9r>

The sixth workshop within the IEEE AP-S Distinguished Lecturer (DL) Program Northern Europe & Western USA Tour was held at **SCU – SANTA CLARA University's** Sobrato Campus for Discovery and Innovation, Frugal Innovation Hub, between 18:00 – 20:00, on Oct 7, 2026. It was the first AP-S DL event for the last six years in Santa Clara Valley. Dr. Kurt Schab, from SCU and Darin Phelps, IEEE SCV Joint Chapter MTT, AP-S Chair, from Keysight Technologies were the hosts. The speakers and their titles were:

◇ **Exploring new frontiers: the Mars Helicopter Ingenuity's groundbreaking journey**: Dr. Nacer CHAHAT, IEEE Fellow, IEEE AP-S DL, NASA - JPL, Caltech, USA.

◇ **From Engineering Electromagnetics to Electromagnetic Engineering: Teaching, Training Next Generations**: Prof. Levent SEVGİ, IEEE Fellow, IEEE AP-S DL, Istanbul Technical University (ITU), Türkiye



Here is the link for a 3min-video of the event: <https://lnkd.in/dwGCy2Mb>

The seventh and last workshop within IEEE AP-S Distinguished Lecturer Northern Europe & USA Tour was held at **Stanford University**, CA - USA between 09:00AM – 12:30PM. The venue was Allen 101X, 330 Jane Stanford Way, Stanford, CA. The hosts were Prof. Constantine Sideris, Stanford University and Austin Xavier Rothschild, Chair, IEEE AP-S/MTT-S Stanford Jt. Student Branch Chapter. The speakers and their titles were:

◇ **From Engineering Electromagnetics to Electromagnetic Engineering: Teaching, Training Next Generations:** Prof. Levent SEVGİ, IEEE Fellow, IEEE AP-S DL, Istanbul Technical University (ITU), Türkiye

◇ **Exploring new frontiers: the Mars Helicopter Ingenuity's groundbreaking journey:** Dr. Nacer CHAHAT, IEEE Fellow, IEEE AP-S DL, NASA - JPL, Caltech, USA.

◇ **Biofriendly Antennas: Antennas made of Recyclable Materials:** Dr. Sima NOGHANIAN, IEEE AP-S DL, CRN, California, USA.

◇ **Empowering Smart Radio Environments with Quantum Computing and Machine Intelligence:** Prof. Zhen PENG, IEEE Fellow, IEEE AP-S DL, University of Illinois Urbana-Champaign (UIUC), USA.



Here is the link for a 3min-video of the event: https://lnkd.in/d4F_v8dJ

Between Northern Europe and USA workshops we had the 2-day, Winter IEEE AP-S AdCom meeting in Salt Lake City, on October 3 & 4, 2026. Right after the AdCom, we attended RF & Wireless Day, in the **University of Utah**, hosted by Prof. Dr. Cynthia Furse with experts all around the world, mostly from IEEE AP-S, either AdCom members (President, Past-Presidents, President-Elect, committee chairs, ...) or distinguished lecturers. Here is a 3min video of the day: <https://lnkd.in/dQPBVWNe>

Below are few selections of photos and selfies from the tour, AP-S AdCom, and Utah Wireless day.



Picture 1: The Flyer and selection of photos and selfies from Oslo workshop.



Picture 2: The Flyer and selection of photos and selfies from Gothenburg workshop.



Picture 3: Selection of photos and selfies from Stockholm day.



Picture 4: The Flyer and selection of photos and selfies from Oulu workshop.



Picture 5: The Flyer and selection of photos and selfies from Aalto workshop.



Picture 6: A collection of photos from Santa Clara Workshop.



Picture 7: A collection of photos from Stanford Workshop.



Picture 8: A group photo from IEEE AP-S Utah AdCom meeting.



Picture 9: A collection of photos from Utah University Wireless Day.