

IEEE AP-S DL Workshop – Chalmers Edition

Topic: Modern Computational and Analytical Analysis Methods and Electromagnetic Structures

Date: September 23, 2026

Location: Chalmers University of Technology, Johanneberg campus, EDIT building, Hörsalsvägen 11, 412 96 Gothenburg, Sweden

Attendance: 35 participants in person

Audience Profile: M.Sc. and Ph.D. students, academic researchers, industrial representatives from local companies.

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Executive Summary

On September 23, 2026, Chalmers University of Technology and the WiTECH Competence Centre hosted the Gothenburg workshop of the IEEE AP-S Distinguished Lecturer Northern Europe Tour 2026. The workshop was part of a wider initiative coordinated by Professor Levent Sevgi, Chair of the IEEE Antennas and Propagation Society Distinguished Lecturer Program.

The Gothenburg event was organized by the Antenna Systems Group at Chalmers, the WiTECH Competence Centre, and the IEEE Sweden Section Joint MTT/AP Chapter, under the local leadership of Professor Marianna Ivashina.

Professor Ivashina opened the workshop by welcoming the five distinguished lecturers and more than 35 participants. In her opening remarks, she highlighted the value of international scientific exchange and the importance of maintaining strong links between the local research community and the wider IEEE AP-S network.

The programme brought together researchers from Türkiye, Sweden, Finland, and the United States. Over five lectures, the speakers addressed computational electromagnetics, scattering and diffraction, spatial degrees of freedom, metamaterials and composites, and statistical wave analysis.

Scientific Program

The workshop featured five IEEE AP-S Distinguished Lecturers. Their presentations covered complementary aspects of electromagnetic theory, modeling, and computation, ranging from

established numerical methods to emerging questions in near-field communication and complex wave environments.

- 1) **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.
- 2) **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.
- 3) **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.
- 4) **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.
- 5) **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.

Taken together, the five lectures offered a broad view of contemporary electromagnetic research. The program moved naturally from numerical foundations and classical wave phenomena to physical bounds, engineered materials, and the statistical behavior of complex systems. Recommendation for the future DL events would include limiting the number of lecturers to a maximum of 3 to maximize interactions between them and the audience, in particular, the students and external participants.

Interaction and Participation

More than 35 participants attended the workshop. Questions followed each lecture, and several discussions continued during the breaks, giving participants time to examine particular methods and ideas in greater depth with the speakers.

The range of topics encouraged connections across areas that are often considered separately. Computational techniques were discussed alongside physical interpretation, fundamental limits, material modelling, and statistical methods. This gave participants several perspectives on how complex electromagnetic problems can be formulated and understood.

The presence of lecturers from four countries also brought different research traditions and experiences into the room. The resulting discussions were open and engaged, with participants contributing questions throughout the program. The atmosphere remained informal and welcoming while allowing for substantial technical exchange.

Beyond the individual presentations, the workshop created an opportunity for members of the local community to meet leading researchers in the field, establish new contacts, and strengthen existing links within IEEE AP-S.

Conclusion

The Gothenburg workshop was a successful stage of the IEEE AP-S Distinguished Lecturer Northern Europe Tour 2026. Its five lectures gave participants a focused overview of important developments in electromagnetic modeling, computation, materials, and wave physics.

The strong attendance and active discussions demonstrated the value of bringing distinguished lecturers and the regional research community together in person. The event strengthened connections among Chalmers University of Technology, the WiTECH Competence Centre, the IEEE Sweden Section Joint MTT/AP Chapter, and the wider IEEE AP-S community.

The workshop concluded with new ideas to consider, useful contacts to continue, and a shared interest in further scientific exchange.



Picture 1: The flyer of the Workshop.



Picture 2: Workshop participants.



Picture 3: A collection of photos from the workshop.