
SEMINAR**Field Quantities - a Geometrical Perspective****Speaker:** Prof. Ioan E. Lager*(Delft University of Technology, Netherlands)***Date:** 16 February 2017 @ 11:00 AM**Location:** Room Ofek – Polo Scientifico F. Ferrari – Povo**Note:** The seminar will be held in English**Contact:** Prof. Giacomo Oliveri (giacomo.oliveri@unitn.it)

There seems to be a wide consensus in the antenna community that the most adequate (the only?) representation of the electromagnetic (EM) field quantities is as three-dimensional (3D) vectors. However, this representation of the field quantities is not free of inconsistencies, as pointed out already at the time of the introduction of the vector algebra in the EM theory (the end of the XIX-th century). These inconsistencies seem to have little (if any) impact in antenna engineering and, hence, they are (intentionally) overlooked.

The situation is different in computational EM, where ignoring the inconsistencies was shown to be at the origin of fundamentally wrong results and, thus, made conceptual revisions mandatory. As a result, the entire view on the computational approaches to solving the field equations has changed.

This seminar will look deeper into this (apparent) discrepancy. It will review the various modalities of representing EM field quantities and will assess the opportunities and deficiencies of their vector representation. A twofold objective is aimed at: (i) Bringing some conceptual clarifications that the author deems expedient for the antenna community. (ii) Providing means for understanding the fine details in the solutions obtained via (commercial) EM analysis software in the case of highly inhomogeneous configurations. The account will intentionally avoid technical detail, the employed mathematical apparatus being stripped to the basics needed for understanding the discussed aspects. All (mathematical) instruments are well covered in the literature, with relevant bibliographic sources being provided during the talk.

• About the Speaker

Ioan E. Lager was born in Brasov, Romania, on September 26, 1962. He received the M.Sc. degree in electrical engineering (1987) from the University of Brasov, Romania, the Ph.D. degree in electrical engineering (1996) from Delft University of Technology, Delft, the Netherlands, and a second Ph.D. degree in electrical engineering (1998) from the University of Brasov.

He successively occupied research and academic positions with the University of Brasov and the Delft University of Technology, where he is currently Associate Professor. In 1997 he was Visiting Scientist with Schlumberger-Doll Research, Ridgefield, CT. He has a special interest in bridging the gap between electromagnetic field theory and the design, implementation and physical measurement of wireless systems. His research interests cover computational electromagnetics and antenna engineering, with an emphasis on pulsed-field electromagnetic propagation and non-periodic (interleaved) array antenna architectures.