

**Wave–Material Interaction in Electromagnetics:  
Effects of Homogenization of Mixtures and Classification of Complex Media Responses**

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***5 & 6 Nov 2012 (Mon-Tue), 2:30 - 5:30 pm, Room 5620 (5/F via Lifts 31-32)***

**Abstract:**

The learning objectives of this set of lectures include that the attendees shall understand qualitatively and be able to analyze quantitatively the manner how complex materials interact with electromagnetic fields, including the phenomena of dispersive properties of media and the effect of heterogeneities, and also the peculiarities that so-called metamaterials bring into the electromagnetic analysis. A short syllabus reads:

1. Introduction: principles of wave-material interaction, basic dispersion models
2. Homogenization principles and mixing formulas for structurally non-uniform media
3. Anisotropic, bi-anisotropic, and extreme-parameter materials
4. Philosophy of metamaterials

Presentation style will be interactive lectures and discussions. Depending on the number and expectations of the participants, also other types of instruction (group work, etc.) may be possible.

**About the speaker:**

Prof Ari Sihvola received the degrees of Diploma Engineer in 1981, Licentiate of Technology in 1984, and Doctor of Technology in 1987, all in Electrical Engineering, from the Helsinki University of Technology (TKK), Finland. Prof Sihvola is professor of electromagnetics in Aalto University School of Electrical Engineering (formerly known as TKK) with interest in electromagnetic theory, complex media, materials modelling, remote sensing, and radar applications. Besides working for TKK and the Academy of Finland, he held visiting appointments at Massachusetts Institute of Technology, Pennsylvania State University, Lund University, the Swiss Federal Institute of Technology and University of Paris XI, France. He is Chairman of the Finnish National Committee of URSI (International Union of Radio Science), official member for Finland of URSI Commission B (Fields and Waves), and Fellow of IEEE. He was awarded the five-year Finnish Academy Professor position starting August 2005. He is also director of the Finnish Graduate School of Electronics, Telecommunications, and Automation (GETA).

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