ECE Speaker Series

Department of Electrical and Computer Engineering

Robert Magnusson

Texas Instruments Distinguished University Chair
Department of Electrical Engineering
University of Texas - Arlington

Guided-mode resonance nanophotonics: Fundamentals and applications

We review principles and applications of nanophotonic devices based on fundamental electromagnetic resonance effects in thin periodic films. We discuss design and optimization with rigorous mathematical methods and review typical fabrication processes. Theoretical and experimental results for representative devices are furnished. These include single-layer wideband reflectors, nonfocusing spatial filters, nanogrid reflectors and polarizers, and resonant biosensors. The compact nature and high-efficiency operation of this device class motivates many applications where minimal, robust, and lightweight devices are desired. Indeed, the fundamental resonance effects discussed are operative in many current 1D and 2D "meta"-surfaces and metamaterials with an attendant resurgence of publications. The guided-mode resonance concept applies in all spectral regions, from the visible band to the microwave domain, with available low-loss materials.

February 13, 2016 at 10:00am in Egr Bldg 2, Rm W122

Robert Magnusson is the Texas Instruments Distinguished University Chair in Nanoelectronics and Professor of Electrical Engineering at the University of Texas at Arlington. He directs the UT-Arlington Nanophotonics Device Group conducting theoretical and experimental research on periodic nanostructures, nanophotonics, nanoelectronics, nanoplasmonics, and optical bio- and chemical sensors. He is a Fellow of SPIE, the Optical Society, IEEE, and the National Academy of Inventors.

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