

Computational ElectroMagnetics

- The work in the CEM Lab focuses on the development and implementation of new and efficient computational algorithms and modeling techniques in electromagnetics.
- The research projects combine deep understanding of the physics of the problem and ability to borrow novel mathematical tools from areas such as signal processing and approximation theory.
- The research projects involve both fundamental and applied aspects. The computational techniques are brought to bear on practical problems such as wave propagation and scattering, novel antennas, microwaves, and optical guiding structures.
- Research Subjects include:
 - Low-profile directional antennas for satellite communications.
 - Multiresolution expansions for efficient wave scattering analysis.
 - Hollow-core and solid-core photonic crystal fibers.
 - Optical and millimeter wave near-field microscopy.
 - Analysis of photonic band gap guiding structures, filters, and couplers.
 - Time-domain analysis of transient wave scattering.
 - Design technologies for UWB antennas based on Genetic Algorithms.

