

Electromagnetics and Applications

Graduate Research and Courses
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Research Areas in Electromagnetics and Applications

- **Antennas and Radiation**
 - Advanced antenna design: high efficiency, wide-angle steering arrays, antenna miniaturization
 - New materials: artificial materials, metamaterials
 - Printed and integrated antennas and phased arrays.
- **Microwave Circuits and Devices**
 - Advanced RF/microwave circuits with new materials, new waveguides and integration concepts
 - Circuits for millimeter, sub-millimeter wave, terahertz applications, multilayer ICs, multilayer large phased arrays.

Research Areas in Electromagnetics and Applications (Contd.)

- **Plasma Engineering and Ionospheric Propagation**
 - Wave propagation in plasma medium, ionospheric propagation, communication applications
 - Plasma applications in aerodynamic design, material processing, bacterial decontamination
- **Electromagnetic Theory and Computational Electromagnetics**
 - “Smart-EM” analysis and computation.
 - Artificial material modeling .
 - Large system, high frequency or large bandwidths, fast design optimization for complex systems

Application Areas

- RF electronics (satellite, cell phones, wireless systems)
- Radar systems
- High-speed computer IC and packaging
- Smart antennas
- Plasma applications in communications, materials, aerodynamics.

Graduate Courses and Research Options

- EL Courses: EM Theory (EL6713, Core), Antennas (EL6723), RF Engineering (EL5753), RF/Microwave Integrated Circuits (EL5463), RF Propagation (EL6753), Plasma Engineering (EL5753), Optical Communication (EL6583)
- Graduate Math courses on numerical methods, differential equations, complex variables
- Independent Study for preparatory material
- Master's thesis for new work or substantive extension of past work .
- PhD thesis for new work, much larger in scope or significance