

## Partial List of Current Research Projects



### Military and Homeland Defense

- Detection of Bacteria, Spores and Viruses
- Terahertz Spectroscopy
- Optical Imaging through Clouds, Fog, Smoke and Water
- Optical Water Quality Monitoring
- Tunable Multiple Quantum Well GaN/AlGaIn UV Photodetectors and Emitters



### Medical

- Optical Mammography
- Optical Biopsy
- Detection of Skin Cancer
- Photonic Pill for the Detection of Cancer
- Sutureless Tissue Welding Using Lasers
- Novel Proteins Involved in Sterol Homeostasis
- Brain Activities Using Near Infrared Spectroscopy
- Raman Spectroscopy of Biomedical Materials



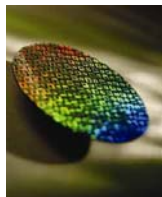
### Communications

- Increasing Bandwidth of Fiber Optic Telecommunications Networks (Nonlinear Fiber Optics and Devices, Ultrafast Optical Switches, Wavelength Multiplexing and Other Structures, Wideband Amplifiers)
- Network Architecture for Wireless Sensors
- Photodeposition of Porous Claddings on Silica Fibers
- Multiplexed Digital Video Transmission System



### Lasers

- Ultrafast Laser Technology (femtosecond and picosecond)
- Near Infrared Tunable Solid-State Lasers Using Cr<sup>4+</sup> Doped Crystals and Structures
- II-VI Compounds for Quantum Cascade Lasers



### Industrial Materials, Semiconductors and Polymers

- Subsurface Imaging of Cracking and Corrosion Under Paints
- Optical and Thermal Conductivity Characterization of GaN, AlGaIn and Other Wide Band Gap Semiconductors
- Colored Photovoltaic Modules Integrated into Building Materials
- Defect Detection in PCB Interconnects
- Cationic Copolymerization