

Nano-Devices

- **Sensors**
(SAW & Ionization Based)
- **Actuators**
(Photo-Thermo-Mechanical)
- **Membranes**
(Nanotube & Graphene Based)
- **Field Emission**
(Carbon Nanotube Cones)

Composites for Structural Applications

- **Graphene Nanofillers in Polymer, Ceramic and Metal Matrices**
 - **Mechanical Properties** (Modulus, Strength, Fracture Toughness, Fatigue Life, Wear and Damping) and Flame Retardation
- **Structural Health Monitoring & Healing**

Koratkar Lab Research Thrusts

Coatings and Nanofluids

- **Coatings: Super-hydrophobic to Super-hydrophilic wetting control**
- **Coatings: Boiling heat transfer**
- **Nano-fluids: Cutting fluids for cooling during micro-machining**
- **Nano-Bio-fuels (ethanol and bio-diesel) with enhanced combustion**

Materials for Energy

- **Si and C-Al-Si Nanostructures for Lithium-Ion Battery Anodes**
- **H₂ and CO₂ Storage in Graphene**
- **Pt Nanorods for PEM fuel cells**
- **Energy Harvesting from Motion of Fluids/Gases**