



# Novel Engineered Materials



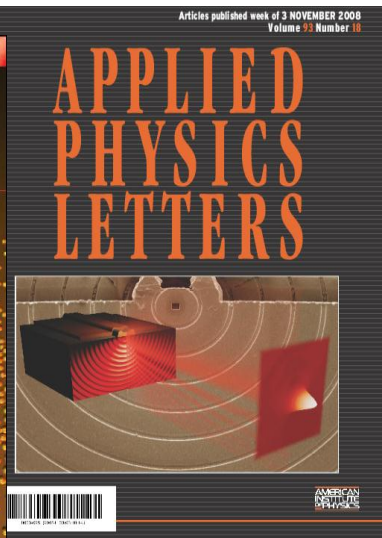
## *Engineered design of basic properties and transport of energy/information in materials & structures*

### • Enabled capabilities

- Nanoscale Subsurface Spectroscopy
- Plasmon-enhanced Detectors & Imagers
- Phased Antenna Arrays
- Microvascular Autonomic Composites
- Novel Coatings (ex. Ice free, water repellent)

### • Select breakthroughs

- Sub-wavelength Elements, Plasmonics, Photonic Crystals, Metamaterials
- Self-sensing & Self-healing Materials
- Biologically Inspired Structures
- Computational & Fast-algorithm Tools



### • Key research challenges:

- Efficiently convert optical radiation into localized energy, and *vice versa*.
- Enhancing local photophysical processes
- Precise assembly & fabrication of hierarchical 3-D photonic
- Integrating plasmonics with nanostructured semiconductor devices