# Synthesis and Characterization of Cuprous Oxide Nanodots, Nanorods, and Thin Films

**Haitao Zhang, Zigeng Yin, Duane M. Goodner, Michael J. Bedzyk, Tobin J. Marks, John B. Ketterson, and Robert P. H. Chang,**
**Northwestern University,** CHE-0201767 & DMR-0076097

Cuprous oxide ($Cu_2O$) is a *p*-type semiconductor with unique excitonic properties of importance in nanophotonic devices. Using MOCVD techniques, we developed a new process to selectively grow $Cu_2O$ nanodots on $LaAlO_3$ (right) and nanorods on Si (bottom left). For comparison, $Cu_2O$ films were also grown using sputtering (bottom right). Characterization techniques including XRD, SEM, AFM and TEM demonstrate the high-quality crystalline nature of these $Cu_2O$ structures, and that morphology and microstructure are strongly dependent on the kinetics of the growth process.