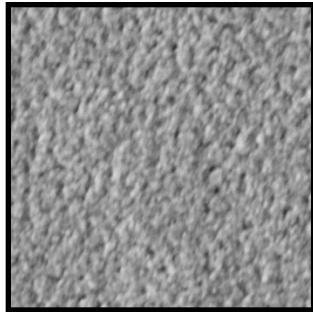




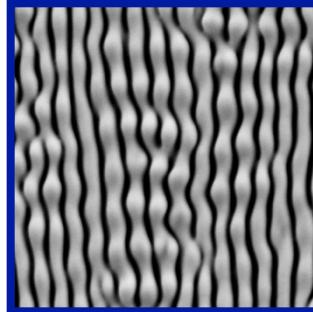
Light-mediated pattern formation in chalcogenide nanostructures

Nathan S. Lewis and Harry A. Atwater
California Institute of Technology

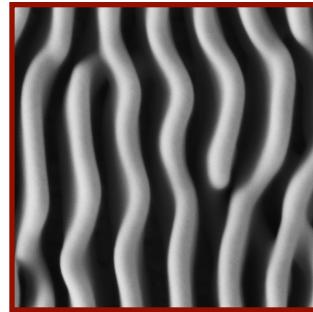
Dark
growth



Growth under
405 nm light

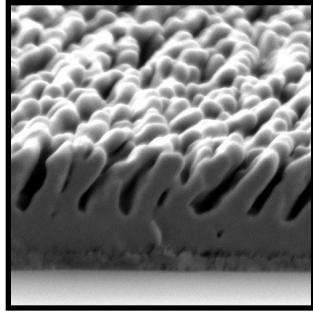


Growth under
940 nm light

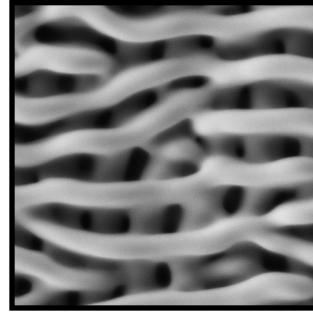


1 μ m

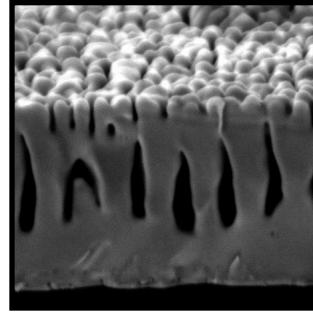
Light at
60° angle



90° shift
in polarization



Change in
wavelength



1 μ m

B. Sadtler et al., in preparation

November 2011 Research Highlight

LIGHT-MATERIAL INTERACTIONS IN ENERGY CONVERSION

Achievement:

- **Light-mediated** formation of **nanoscale lamellar patterns** during the growth selenium-tellurium (Se-Te) alloys.
- The **illumination conditions** (intensity, wavelength, polarization and incident angle) **control the resulting pattern**
- The Se-Te nanostructures are **dynamically responsive** to changing illumination conditions during growth

Significance:

Light-directed growth of energy conversion materials enables the development of **complex 3D architectures** with **tailored optical responses** through dynamic feedback between the illumination conditions and growing morphology