

EE 298-12
Solid State Technology and Devices Seminar

Friday, 4 October 2013
1-2pm
Hogan Room - 521 Cory Hall

Phase Change Materials – Device Scaling and Materials Innovation

Feng Xiong
UIUC/Stanford

Abstract

Phase Change Material (PCM) is a promising candidate for the next generation non-volatile memory technology. We have been working to investigate the fundamental scaling limits of conventional PCM – Ge₂Sb₂Te₅ (GST) and explore new materials that may be more suitable for phase change random access memory (PCRAM) applications. By using the ultra small carbon nanotubes (CNTs) as electrodes for GST, we are able to achieve a 100× reduction in programming current (~0.1 μA set, ~1.6 μA reset) with outstanding on/off ratios (~1000). From the materials side, GaSb alloys are found to be potential candidates for PCRAM because of their atypical negative optical contrast and high crystallization temperature. Both properties are desirable for PCRAM applications.