

## **In situ and ex situ TEM study of switching in lateral phase-change memory cells**

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In recent years great progress has been made towards understanding the theoretical foundations of phase-change memory. However, real devices often exhibit reliability issues and inconsistent switching that necessitates further experimental investigation. TEM studies can provide great insight into the phase-change behavior by providing high resolution images and compositional analysis. In this talk we demonstrate the fabrication and measurements of GeTe NW lateral phase-change cells on TEM membranes and compare it to our switching studies on silicon substrates. Surprisingly, the dominant switching mechanism appears to be the formation and closing of voids. Further we discuss the fabrication of sputtered GST line cells on membranes and show early results of TEM observation before and after switching in these devices.