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**Temperature-dependent Characterization of Ge2Sb2Te5 using Multi-wavelength Ellipsometry** DEREK LEFCORT, HASAN TALUKDER, HELENA SILVA, University of Connecticut — With extensive developments over the past few decades, chalcogenide materials have developed from optical disk storage materials to leading candidates for electronic phase change memory (PCM), bridging the gap between the much slower flash memory, and the faster but volatile DRAM. PCM is based on the fast (1-100 ns) and reversible transitions between crystalline and amorphous states of chalcogenide compounds, with high contrast in electrical resistivity that is utilized for data storage. Switching between the stable crystalline state and the metastable amorphous state is done through suitable electrical pulses for crystallization or melt-quench amorphization. Ge2Sb2Te5 (GST) has been the most common PCM material due to its suitable properties but repeated cycling between states (>10ˆ10 cycles) tends to result in voids within the active region of a device, due to the mass density change between its amorphous and crystalline phases. Voids can leave a device in an irreversible high resistance state and are a main failure mechanism in PCM. We aim to study the amorphous-crystalline mass density change of GST films deposited by sputtering under different conditions, using in-situ ellipsometry, to identify deposition conditions that can minimize void formation in the material.

Derek Lefcort
University of Connecticut

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