

# Emergent AI Center Seminars

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Online

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## **Domain wall-magnetic tunnel junction devices for in-memory and neuromorphic computing**

There are pressing problems with traditional computing, especially for accomplishing data-intensive and real-time tasks, that motivate the development of computing devices to both store information and perform computation (in-memory) as well as efficiently implement neuromorphic computing architectures. Magnetic tunnel junction memory elements can be used for computation by introducing a third terminal and manipulating a domain wall, a transition region between magnetic domains, below the junction, called a domain wall-magnetic tunnel junction (DW-MTJ). I will present results on building DW-MTJ devices and circuits with high on/off ratio, as well as modeling their behavior for bio-inspired energy-efficient computing, including spike-timing dependent plasticity, winner-take-all, and leaky, integrate, and fire properties.