“A Pathway for Efficient Magnetic Memory Devices”

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Abstract:
Emerging data-driven technologies highly rely on our electronic memory devices and there is an ongoing search for new materials and devices with improved capacity, speed, and dissipation. Spintronics and magnetism have significantly impacted our memory technologies, facilitated by the discoveries of new materials and phenomena. However, further density scaling is facing severe limitations due to the large switching current requirements. A pathway for further improvements is to explore new materials and phenomena that will lower the switching current and/or switch gear to an electric-field based switching mechanism.

In this talk, I’ll discuss a new mechanism for electric-field induced switching based on several established quantum effects. The proposed mechanism decouples the switching energy threshold from the switching speed, which is surprisingly different from the conventional magnetic memory devices that exhibit a trade-off between these two parameters.

Biography:

Shehrin Sayed is a postdoctoral researcher in EECS, University of California, Berkeley. His research interest is on the transport physics of new materials and devices with the aim to enable new functionalities within standard electronics. His current research focus is on spintronics and magnetism. He received his Ph.D in 2018 from the Department of Electrical and Computer Engineering, Purdue University. His Ph.D dissertation received the 2018 award by Dimitris N. Chorafas Foundation for his contributions in spintronics.