



Physics and Astronomy Seminar

Magnetoresistive Random Access Memory

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Magnetoresistive Random Access Memory (MRAM) is a type of nonvolatile memory storage that has great potential in future applications such as space flight and instant-on technology. MRAM utilizes the unique properties of ferromagnetic materials to store memory as a specific magnetic orientation rather than as an electrical charge. One of these properties, Giant Magnetoresistance (GMR), is an effect that occurs when two neighboring ferromagnetic elements are aligned antiparallel. The critical element behind the operation of MRAM is called a Magnetic Tunnel Junction (MTJ) which exploits GMR in order to identify the resistivity of a given ferromagnetic pair. MTJs are fascinating devices in that they exhibit quantum mechanical electron tunneling in order to operate effectively. These properties, however, will only exist below a given temperature known as the Curie Temperature.

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