
Colloquium

Spintronics – History, Phenomena, and Future

Daniel E. Bürgler

Peter Grünberg Institute, Forschungszentrum Jülich, Germany

Since the discovery of interlayer exchange coupling and giant Magnetoresistance (GMR) in the 1980's spin-dependent transport in magnetic multilayer and nanostructures has attracted a lot of interest. The research was motivated by applications –i.e. GMR read-heads in computer hard disk drives and magnetic random access memory (MRAM) devices– as well as exciting new phenomena, which nowadays constitute the research field called spintronics. The field rapidly developed from investigating magnetic multilayers with layer thicknesses in the nanometer range to a true nanotechnology, which explores magnetism and spin-dependent transport on a nanometer scale. The recognition of spintronics as a pioneering field for future nanoelectronics culminated in the award of the Nobel Prize in Physics 2007 for the discovery of the GMR effect. I will highlight the historical development of spintronics and briefly review interlayer exchange coupling, giant and tunneling magnetoresistance (GMR, TMR), current-induced magnetization dynamics, pure spin currents, and molecular magnetism as major novel phenomena of spintronics.

Thursday, Dec 11th 2014

11:30 AM (Tea/Coffee at 11:15 AM)

Seminar Hall, TCIS