DEPARTMENT OF PHYSICS UNIVERSITY OF MARYLAND **CNAM** Condensed Matter Colloquium

2pm, **October 8th,** Room 1201

Transporting and Controlling Spin in Mesoscale Ferromagnetic Semiconductor Devices

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Heterostructures built from the canonical ferromagnetic semiconductor (Ga,Mn)As are useful for developing proof-of-concept semiconductor spintronic devices. After an introductory overview of exchange coupling and spin transport in macroscopic (Ga,Mn)As devices [1,2,3], we discuss recent experiments that probe spin transport and current-driven magnetization control in mesoscale tunnel junctions [4]. These experiments suggest that both correlations and localization play a key role in spin-dependent tunneling in (Ga,Mn)As in the mesoscale regime.

[1] M. Zhu, M. J. Wilson, B. L. Sheu, P. Mitra, P. Schiffer, and N. Samarth, Appl. Phys. Lett. **91**, 192503 (2007).
[2] M. Zhu, M.J. Wilson, P. Mitra, P. Schiffer and N. Samarth, Phys. Rev. B **78**, 195307 (2008).
[3] M. J. Wilson, M. Zhu, R. C. Myers, D. D. Awschalom, P. Schiffer and N. Samarth, arxiv:0905.3691.
[4] P. Mitra, M. J. Wilson, K. Thadani, D. C. Ralph, P. Schiffer and N. Samarth (in preparation).

Host: Min Ouyang