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THE UNIVERSITY of WISCONSIN MADISON

**Department of Physics Colloquium**

Friday, November 20, 2009 • 4:00 P.M. • 2241 Chamberlin Hall

cookies & coffee served at 3:30 p.m

# Superconductivity at Dawn of the Iron Age


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Host: Chubukov



Recent discovery of iron-based high-temperature superconductors hints at a new pathway to the room temperature superconductivity. The new materials feature FeAs layers instead of the signature $CuO_2$ planes of much studied cuprate superconductors. The antiferromagnetism also appears to be involved, although the d-electrons in FeAs seem considerably more mobile than their cuprate cousins. This high mobility, facilitated by a large overlap amongst atomic orbitals of Fe and As, plays a crucial role in warding off Hund's rule and the large local moment magnetism of Fe ions, the archrival of superconductivity. A pedagogical review of the current status of the high-temperature superconductivity field will be presented, highlighting similarities and differences between Fe-pnictides and cuprates and emphasizing the importance of the multiband nature of magnetism and superconductivity in these new materials.