

Physics Department, IIT Kanpur

## **PHY 624 : Magnetism in Materials**

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A short review of basic electromagnetism; Quantum mechanics of spin, origin of magnetic moments in atoms and ions; crystal field; non-interacting magnetic moments, dia and paramagnetism; Interaction between moments, long range magnetic ordering and broken symmetry, ferro and antiferromagnetism; magnetism in metals; magnetic frustration, spinliquids; multiferroics and magnetoelectricity; nanomagnetism; standard experimental techniques and theoretical models.