



Physics Graduate Seminar

13:30 pm, Tuesday, February 7, 2012, Rm B201

SCALING THEORY FOR CROSS-FIELD TRANSPORT OF COSMIC RAYS IN TURBULENT FIELDS

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Abstract: The transport of charged particles (e.g., cosmic rays) in astrophysically relevant, turbulent magnetic fields (like they exist, e.g., in the solar wind) is investigated. Generic theoretical models—using concepts and insights developed recently in the context of magnetic confinement fusion research—are applied to the present problem and confirmed by means of numerical simulations. At high energies, a novel transport regime is found, in which the particles decorrelate on a gyro-orbit timescale. Explicit scaling laws for the cross-field diffusivities in various limits are derived.