



Physics Colloquium



Thursday, April 27th at 3:30 pm in SC 234

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Magnetars: Neutron Star Playgrounds for Exotic Physics

Magnetars are the most powerful compact objects in the stellar mass range observed in the Milky Way. The initial spikes of giant flares seen in three soft gamma repeaters (SGRs) dwarf the fluxes of even the brightest cosmological gamma-ray bursts. Periodicity seen in magnetar quiescent and outburst emission, and distinctive "spin-down" lengthening of the period have driven the paradigm that strongly-magnetized neutron stars constitute these fascinating sources. The steady X-ray emission includes both thermal atmospheric components and magnetospheric contributions that masquerade as hard X-ray "tails." This talk introduces observational and theoretical elements pertinent to outburst and quiescent emission in magnetars, including seismic activity, dissipative processes in their magnetospheres, and elements of Comptonization and polarization. It also discusses the action and possible signatures of exotic QED mechanisms like photon splitting and magnetic pair creation, and the quest for observational vindication of the fundamental physics concept of vacuum birefringence.

Refreshments at 3:00 pm in SC 103