



SPACE PHYSICS SEMINAR

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Extreme Space Weather on Close-in Exoplanets

Thursday, September 26, 2013

725 Commonwealth Ave.

Refreshments at 3:30pm in CAS 500

Talk begins at 4:00pm in CAS 502

Abstract:

Exoplanetary research is driven by the ultimate goal of defining whether life can exist beyond the Earth and the solar system. Commonly, a planet is defined as habitable if its surface temperature allows water to exist in a liquid form. In contrast, the physics of the solar atmosphere, the interplanetary environment, and the upper atmospheres of planets in the solar system, including the Earth, is governed by the electromagnetic forces and interaction between charged particles and magnetic fields. In particular, the atmosphere of the Earth is shielded from the intense radiation in space and from the solar wind by the Earth's intrinsic magnetic field. In exoplanetary systems, and in particular, in those with close-in planets, the strong X-ray and ultraviolet (UV) radiation, and the stellar magnetic activity might strongly effect the planet's atmosphere. In these extreme space conditions and without a strong intrinsic magnetic field, the atmospheres of such planets could be completely evaporated or eroded. As a result, they might not be habitable after all. In my talk, I will present a numerical study of the space environment of close-in exoplanets, the interaction between the planet and the star, and the role of space plasma effects in planet habitability.