

Magnetosphere Models

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An effective protection shield of a planet against the stellar wind and Cosmic Rays and presumably even a prerequisite for life is an intrinsic magnetic field. This talk first briefly reviews the generation of a magnetic field in the interior of terrestrial planets, gas and ice giants and exemplifies the mathematical description and the characterization of the resulting field. The second topic is the interaction of energetic particles like Cosmic Rays with the magnetic field of the Earth, followed by a description of the formation of a magnetosphere due to interaction of the planetary magnetic fields with the magnetized solar wind for the eight planets of the Solar System. Point four is devoted to basic processes of geomagnetic activity, supplemented by studies of the solar wind interaction with Mercury. The next step is the transfer of these models to extrasolar planetary systems. After a brief survey of possible scenarios, the remainder of the talk deals with the magnetic interaction between a star and its close-in planet