# Title: Consequences of the Ion Cyclotron Instability in the Inner Magnetospheric Plasma

George V. Khazanov
NASA Goddard Space Flight Center, USA

**Abstract.** The inner magnetospheric plasma is a very unique composition of different plasma particles and waves. Among these plasma particles and waves are Ring Current (RC) particles and Electromagnetic Ion Cyclotron (EMIC) waves. The RC is the source of free energy for the EMIC wave excitation provided by a temperature anisotropy of RC ions, which develops naturally during inward $\mathbf{E}\times\mathbf{B}$ convection from the plasmasheet. The cold plasmasphere, which is under the strong influence of the magnetospheric electric field, strongly mediates the RC-EMIC waves-coupling process, and ultimately becomes part of the particle and energy interplay, generated by the ion cyclotron instability of the inner magnetosphere. On the other hand, there is a strong influence of the RC on the inner magnetospheric electric and magnetic field configurations and these configurations, in turn, are important to RC dynamics. Therefore, one of the biggest needs for inner magnetospheric plasma physics research is the continued progression toward a coupled, interconnected system, with the inclusion of nonlinear feedback mechanisms between the plasma populations, the electric and magnetic fields, and plasma waves.