



Fascinating Plasma Structures (Jean Dominique Cassini Medal Lecture)

Gerhard Haerendel

Max Planck Institute for Extraterrestrial Physics, 85748 Garching, Germany

In this lecture I will discuss three plasma realms, which have attracted my particular attention because of their fascinating observable fine structure and the complex underlying physics. The structure is, of course, owed to the pervading magnetic field. But it is in particular the role of magnetic tensions that will be highlighted. The three plasma phenomena are: (1) cometary plasma tails, where magnetic tensions transfer momentum from the solar wind under mass loading by the comet; (2) auroral arcs, which owe their energy influx to the release of magnetic shear stresses; and (3) solar prominences, in which cool plasma embedded in the hot corona is subject to a balance of magnetic shear stresses and gravity. The last subject is a recent topic of my research and still bears many secrets. Images and movies will be supplemented by brief characterizations of the key physical processes.