



New results on Mars magnetosphere, ionosphere and aurora

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In this lecture I will review the result obtained so far by the ASPERA-3 experiment (Analyzer of Space Plasmas and Energetic Atoms) on board the Mars Express mission and partially reported in the ASPERA-3 Special Issue of *Icarus*, 2006. ASPERA-3, a comprehensive plasma package measuring electrons (0.01 eV - 20 keV), ions (0.01 - 36 keV), and energetic neutral atoms (0.1 - 10 keV), is on - orbit at Mars since December 2003. I will focus on the new emerging view of the near - Mars space as a dynamical environment as manifested by highly variable energetic neutral atom emissions from the primary production regions as well as oscillations in electron and ion fluxes. I will also demonstrate strong coupling between the Martian upper atmosphere / ionosphere with the near-Mars space and solar wind and review the consequences of such coupling for the total ion escape.