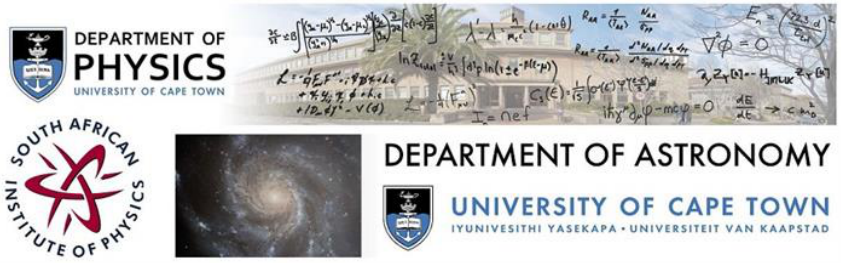

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PLENARY: Fire, Flares and Fusion: Some wanderings in Plasmaland

Thursday, 7 July 2016 12:10 (1 hour)

Abstract content
   (Max 300 words)
Formatting &
Special chars

A plasma is a quasineutral ionized gas whose dynamical behaviour is materially affected by the charged nature of its constituent elements. The so-called fourth state of matter is ubiquitous in the natural universe, although it does not occur commonly on Earth at room temperature. In the first part of the talk we shall give a historical overview of the study of plasmas, both natural and artificially produced. Early fundamental scientific investigations were linked to industrial applications. Plasma studies also developed in the context of trying to understand near-Earth space phenomena. Finally, large-scale developments occurred with the dream of obtaining power from nuclear fusion. In this overview of plasmas, we shall introduce some of the many types of waves that plasmas can support. In the second part of the talk we shall deal with two aspects of waves related to space plasma physics. In space, velocity distributions are commonly nonthermal in nature, with strong non-Maxwellian tails, and we shall thus consider effects of excess superthermal particles on wave behaviour. Finally, we shall describe some recently-found properties of nonlinear phenomena, such as acoustica-type electrostatic
solitary waves (double layers, solitons and supersolitons) in plasmas.

Primary author: Prof. HELLBERG, Manfred (UKZN)

Presenter: Prof. HELLBERG, Manfred (UKZN)

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