

SPACE AND COSMIC RAY PHYSICS SPECIAL SEMINAR

University of Maryland
Computer & Space Sciences Building, Room 2400
4:30 PM Monday, October 27, 2003
Tea & cookies 4:00-4:30 PM

Stamatios M. Krimigis & Frank B. McDonald

Will speak at a special seminar on

The possibility of a heliospheric boundary crossing by Voyager 1

Energetic Particle Enhancements in the Vicinity of the Heliospheric Termination Shock

FRANK B. McDONALD

Institute for Physical Science and Technology
University of Maryland, College Park

Voyager 1 at 85 AU is in the vicinity of the termination shock that marks the abrupt slowing of the supersonic solar wind and the beginning of the extended, complex, and unexplored structure of our distant heliosphere. This vast shock is the expected site for the acceleration of anomalous cosmic rays and the further reacceleration of low energy particles from the inner solar system and of galactic cosmic rays. We have observed a significant increase of energetic ions and electrons that persisted for seven months beginning in mid-2002 at 85 AU. This event differs from any previously observed in that there is a simultaneous increase in galactic cosmic ray ions and electrons, anomalous cosmic rays and low energy ions. However, the low intensity level and the spectral form of the anomalous cosmic ray component indicate we have not reached the termination shock and the observed increase is a precursor event of the type expected as Voyager approaches the shock. It is argued that radial anisotropy is expected to be small in this foreshock region, as is observed.

Voyager-1 Exited the Supersonic Solar Wind at ~85 AU

STAMATIOS M. KRIMIGIS

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We report analyses of a large increase in the intensity of energetic particles observed with the Low Energy Charged Particle (LECP) experiment on Voyager 1 in the outer heliosphere. We argue that Voyager 1 exited the solar wind and passed into a new region (possibly beyond the termination shock) about August 1, 2002 at a distance of ~85 AU (heliolatitude ~34° N), then re-entered the solar wind about 200 days later at ~87 AU. We use LECP data to infer that the solar wind became subsonic. The LECP data also show the composition of ions accelerated at the putative termination shock to be that of anomalous cosmic rays and of interstellar pick-up ions.

Sponsored by: Department of Physics, University of Maryland, and the Institute for Physical Science and Technology, University of Maryland. For information call Matthew Hill at (301) 405-6209 or go to the following website: http://space.umd.edu/seminars/Fall_2003_Seminar.html (A PDF file of this abstract is available for download here.)

For free parking please park in lot DD or anywhere on levels 1-2 in lot B (the big parking garage) after 4.00 pm. Make sure that you park in a spot WITHOUT a parking meter.