ficient. On the other hand, it is possible to apply the formula to a particular type of meteor only (overdense meteor type I), which is a small fraction of the total number observed. We have carried out a statistical analysis of several radio echoes from meteor showers recorded during last years by a radio observer located in Belgium. Results are compared and discussed with those obtained with other methods and available in literature. Foschini L., Astron. Astrophys. 341, (1999), 634

59.39

Preliminary results of the "Tunguska99 Expedition"

G. Longo (University of Bologna), Tunguska99 Expedition Team

In July 14-30, 1999 an Italian scientific expedition was carried out in Tunguska (Siberia), the region of the 1908 explosion of a cosmic body. The main tasks of the expedition were: 1) to study the structure and sediments of Cheko, a small lake located near the epicenter of the Tunguska event; 2) to carry out an aerial photosurvey of the explosion site; 3) to collect wood, peat and rock samples; 4) to monitor gamma rays during the flight Italy - Siberia - Italy and in Tunguska. 1) Our bathymetric mapping of lake Cheko and ultrasound and radar subbottom surveys of stratigraphy suggest that the lake is older than the Tunguska event. 28 cores up to 2 m long have been extracted from the lake bottom (at depths up to 50 m). They show a clear stratigraphy and the analyses at the CNR Institute of Marine Geology in Bologna will hopefully throw light on the nature of the exploded body. 2) The aerial multispectral photosurvey (performed from visual to thermal infrared wave lengths) together with our GPS coordinate measurements on the ground of some reference points, will be used to re-examine some details of the explosion. 3) The petrology and geochemistry of the Mesozoic igneous rocks outcropsing in the Tunguska region is being studied and the collected wood, peat and rock samples will be analyzed in different laboratories to find traces of the cosmic body. 4) The data on gamma rays are being processed in the Bologna University to find their dependence on altitude, longitude, latitude and atmospheric conditions.

59.40

Cosmic Dust in the Earth vicinity

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We discuss recent results from in situ measurements of dust and space debris in the geostationary orbit. Our detector has now collected data for more than two years and during this time a large number of events have been registered. The average number of the impacts of the highest classification (where all signals agree with pre launch laboratory calibration) is 1.7 per day. There is however a strong daily variability where this number can vary from 0 to more than 30. In addition, many impacts occur clustered in time and often reappear at the same time for one or more days after their first appearance. A strikingly strong correlation has been found between the days of high impact flux (>5 per day) and the days where a launch to a geostationary orbit has taken place during the two previous days. We therefore believe that these impacts are related to the launches and possibly consist of slag particles that are known to be ejected at low relative velocities from the solid apogee boost motors that are used to cerculzd the transfer orbit to a geostationary orbit. These impacts, that make up about 30 and the remaining particles will consist of interplanetary particles and random debris particles. These are further separated by their velocity, assuming particles at velocities below the earth escape velocity are earth orbiting debris and the ones at higher velocities are interplanetary. Another interesting but not yet fully explained observation is the high electrical negative charge that is found on many of the particles detected. These events seem to be more common during local night time. The particles would need to be fairly large and slow to give results like these if one considers the plasma environment and the detector sensitivity.

59.41

The mid-infrared spectrum of the zodiacal light observed with ISOPHOT

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The thermal spectrum of the zodiacal light cannot be observed from the ground. We collected 27 mid-infrared (6-12µm) spectra obtained by the spectrophotometer ISOPHOT-S on-board the Infrared Space Observatory (ISO). The observed positions are distributed over the sky region accessible by ISO. The spectrum of the zodiacal light is remarkably well fitted by a Planck curve of about 270 K over the observed wavelength range. No obvious spectral features are detected. The measurements place a strong constrains on models of interplanetary dust concerning constituents and size distributions. The observed slight dependence of the temperature of the zodiacal light on ecliptic position can be modelled in the context of the three-dimensional density and temperature distribution of the interplanetary dust cloud.

59.42

The North/South Asymmetry in Interstellar Pick-up Hydrogen

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Interstellar hydrogen is primarily ionized by charge exchange with solar wind protons, while interstellar helium is primarily photoionized. Utilizing Ulysses data taken at high helio-latitudes to minimize any contributions from large-scale solar wind dynamics, we analyze daily averages of the pick-up hydrogen flux and pick-up helium flux, as well as daily averages of the solar wind proton density and of the heliomagnetic field.

We find that the pick-up hydrogen flux in the northern hemisphere is significantly larger than in the southern hemisphere, for the period investigated. The difference in flux is increasing with increasing heliocentric distance from 1 to 5 AU. The north/south asymmetry appears not to be explainable by any difference in the charge exchange ionization rate, nor by any unusual wave activity or orientation of the magnetic field. Adding to the puzzle is the fact that the pick-up helium does not show any asymmetry.

59.43

A New Planetary Telescope Concept


The NASA IRTF is arguably the only ground-based telescope in the world dedicated to planetary astronomy. Two decades of improvement in infrared array technology, adaptive optics, and large mirror fabrication techniques now make it imperative that the future needs of NASA's Planetary Astronomy program be considered in the context of the capabilities now possible for a modern telescope. In response to a suggestion from NASA Headquarters we have developed an innovative telescope concept which provides unique and unsurpassed scientific capabilities to the planetary community. We call this facility the New Planetary Telescope (NPT).

We have assumed that the main objectives for the NPT are studies of Kuiper Belt Objects, Near-Earth Objects, studies of circumstellar disks and extra-solar planets, and ground-based support for NASA flight missions. These diverse scientific objectives require capabilities ranging over wide-field imaging, high angular resolution, high sensitivity in the optical and