EP 2: Arne Richter Lecture and invited talks

Zeit: Dienstag 11:00–13:00 Raum: HS 19

Hauptvortrag EP 2.1 Di 11:00 HS 19

ROSAT - A key Project in Astronomy and Extraterrestrial Physics — •Joachim Trümper — MPE Garching, Giessenbachstr.1, D-85740 Garching

After introductory remarks about the early years of the AEP/AEF I will describe the history of x-ray astronomy in Germany which culminated in the 1990's with the ROSAT observations, delivering a wealth of discoveries in the X-ray sky.

Preparations for this mission started in 1972 at the Astronomical Institute of the University Tübingen and were intensified in 1974/75 at MPE Garching. A proposal to the "Program of big projects in fundamental science paved the way for the development of the satellite and instruments by a cooperation of DLR, MPE, Carl Zeiss, MBB, Dornier and GSOC. In 1982 the UK and NASA joined the project.

After the launch in June 1990 ROSAT conducted an year all sky survey for half a year - the first one with a powerful imaging telescope - followed by 8 years of pointed observations open to a guest observer program of a wide scientific community. The ROSAT science covers many topics from solar system objects out to quasars at cosmological distances, and from the tiny neutron stars to the clusters of galaxies as the largest objects in the universe.

Hauptvortrag EP 2.2 Di 12:00 HS 19

Magnetic Reconnection in Space, Laboratory and Astrophysical Plasmass — •Jörg Büchner — Center for Astronomy and Astrophysics, Technical University Berlin — Max-Planck-Institute for Solar System Research Göttingen

Reconnection is a phenomenon of magnetic energy release processes, often explosive, in space - , laboratory - and astrophysical plasmas. Conjectured in the 1940ties for the Sun, with first theoretical descriptions in the 1950ties, it has been found to take place starting from small, plasma scales to the large scales typical for astrophysical phenomena. We discuss the current state of understanding reconnection including latest results about its relationship with plasma turbulence and structure formation processes.

Hauptvortrag EP 2.3 Di 12:30 HS 19

The diversity of exoplanet interiors — •Caroline Dorn — University of Zurich

Over the past decades, planet characterization has become a main focus in exoplanetary science. The increasing number of newly discovered extrasolar planets reveal a remarkable diversity in planet sizes and mean densities. Among the most frequently occurring planets are super-Earths and mini-Neptunes, which lack a counterpart in the Solar System. The distribution of interior types among super-Earths and mini-Neptunes is largely unknown.

The challenge in determining planetary interior stems from the fact that data are limited and data uncertainties are large. In a good scenario, both planet mass and radius can be determined. However, very different interiors can be modelled from identical mass and radius. In order to draw meaningful conclusions about a planetary interior, it is therefore mandatory to rigorously quantify interior parameter degeneracy, to carefully select prior knowledge on possible interiors, and to search for additional constraints that can be made available. I will review the state-of-the-art interior characterization and highlight main achievements in finding exotic and less exotic worlds.

It is our understanding of planet formation and evolution that will greatly benefit from more detailed characterized distributions of interior types.