DESY Seminar

11 April 2006, 17:00, DESY Hörsaal

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The Pioneer-Anomaly:

Is the Gravitational Physics Within the Solar System Really Understood?

The Pioneer-Anomaly, an anomalous constant acceleration of the two Pioneer spacecraft 10 and 11 of approx. 8 x 10^{-10} m/s2 toward the Sun, is only one of the unexplained phenomena within our Solar system related to gravity. The other phenomena are

- the flyby-anomaly where navigators from ESA as well as from NASA reported an unexplained increase of the velocity of satellites during an Earth flyby
- the increase of the Astronomical Unit by approx 10 m/cy, and
- the quadrupole- and octopole anomaly which describes a correlation of the quadrupole and octopole components of the cosmic microwave background with the ecliptic of the Solar system.

All these phenomena found no explanation until now; the Pioneer anomaly, however, is the only one which has been discussed to a large extend. In this talk we present all these unexplained phenomena. Then we discuss the error analysis of the Pioneer anomaly and show why, very probably, conventional effects cannot be held responsible for this effect. We also discuss the influence of the cosmic expansion on the physics within the Solar system which is motivated by the intriguing numerical equality of the Pioneer acceleration with the product of the velocity of light and the Hubble constant.

- Tea and cookies will be served at 16:45 in the lobby.
- After the seminar there is a chance for private discussions with the speaker over wine and pretzels also in the lobby.