

Colloquium Notice

Roman Kezerashvili

New York City College of Technology of CUNY

Solar sail to test fundamental physics

The motion of the solar sail is determined by the solar radiation pressure as well as the spacetime geometry. The Pioneer anomaly, which is the unexplained acceleration of the Pioneer 10 and 11 spacecraft on escape trajectories from the outer solar system and the effects of general relativity on a solar sail propelled satellite will be discussed. We present deviations from Kepler's third law for heliocentric orbits near the sun. In particular, we consider deviations in the period of circular orbits due to the spacetime curvature near the sun, frame dragging from the rotation of the sun, and the oblateness of the sun. The Poynting-Robertson effect on a nearly-circular heliocentric trajectory of a solar sail is discussed. In addition, for non-Keplerian orbits which are outside of the plane of the sun, we predict an analog of the Lense-Thirring effect for which the orbital plane precesses around the sun. This can be tested by a solar sail propelled satellite.

Monday

November 8, 2010

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326