

# AN OVERVIEW OF THE GRAVITY PROBE B PROGRAM



C.W. Francis Everitt and the Gravity Probe B Team

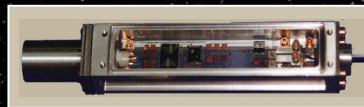
Missions Operations Center



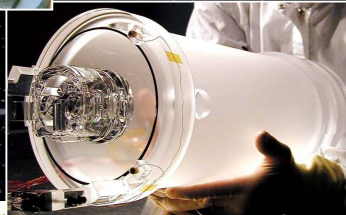
Detector Package



SQUID sensor and package



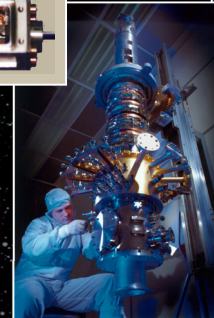
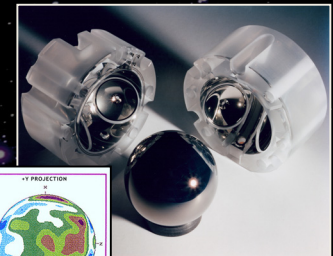
Guide Star tracking telescope



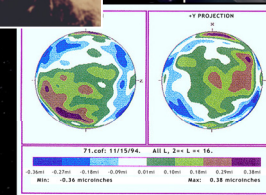
World's roundest spheres



Gyroscope and housing



Probe during assembly



Rotor topology

Launch: 20 April 2004



Vehicle on Booster



645-gallon Dewar

Guide Star  
IM Pegasi  
HR8703

Geodetic Precession:  
6,606 marc-sec/year  
in orbital plane

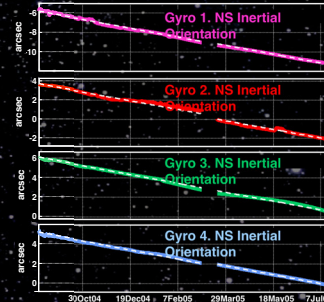
Frame Dragging Precession:  
39 marc-sec/year  
in Equatorial plane

642 kilometers  
(~400 miles)



GP-B Team Receives NASA Award, 2005

First results – Geodetic Precession



$$\Omega = \frac{3GM}{2c^2 R^3} (\mathbf{R} \times \mathbf{v}) + \frac{GI}{c^2 R^3} \left[ \frac{3R}{R^2} (\boldsymbol{\omega} \cdot \mathbf{R}) - \boldsymbol{\omega} \right]$$

