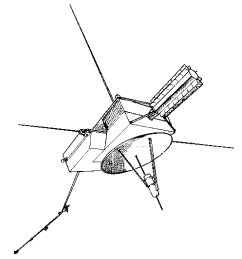




Interplanetary Network for Gamma-Ray Burst Location



- **Since its launch in 1990, the Ulysses spacecraft has been the flagship in the Third Interplanetary Network (IPN), a group of spacecraft missions equipped with gamma-ray burst detectors. Since December 1999, two major improvements have been made: a) the addition of NEAR, the Near Earth Asteroid Rendezvous mission, and b) the ability to process Ulysses data very rapidly (important as there are only a few days to study the burst with optical and radio telescopes before it vanishes). With these two upgrades, the IPN has now become the main source of gamma-ray burst data for astronomers, with about one burst per week being detected. After the data are analyzed at UC Berkeley, locations are immediately sent out via e-mail to over 400 people world-wide. Within a day or so astronomers determine whether they have detected the very faint "afterglow" of the burst. In four cases so far, they have succeeded, and for three of these bursts, they have measured the distances. Their measurements indicate clearly that the bursts were generated when the Universe was about half its present age, and that the energies in the bursts are truly astronomical: gamma-ray bursts are the most energetic explosions in the Universe. The IPN now consists of Ulysses, NEAR, WIND, and the Italian BeppoSAX mission.**