

29:52 Exploration of the Solar System
Class Notes for April 18, 2008
To the Limits of the Solar System

The most distant major planet is Neptune with a semimajor axis of 30.1 astronomical units. Nonetheless, human beings have sent unmanned spacecraft to much greater distances. The Voyager 2 spacecraft is currently about 105 astronomical units from the Sun. The Voyager 1 spacecraft is at a similar, but slightly smaller distance.

The main scientific result which has been obtained from the Voyagers is detection of boundary of the *heliosphere*. The heliosphere is the part of space dominated by the Sun. The heliosphere contains planets and other objects which formed at the same time as the Sun, and out of the same material, and gas in the solar wind which came from the Sun and flows out into space.

Beyond the heliosphere is the *interstellar medium*, or gas between the stars. Between the heliosphere and the interstellar medium is a boundary. Actually, this boundary consists of three layers, the *solar wind termination shock*, the *heliopause*, the the *bow shock*. The Voyager spacecraft have crossed the first of these boundaries.