

## Planetary Wonderings

### September Focus: Voyager --- Interstellar Ambassador and Explorer

By Mary-Frances Bartels, NASA Solar System Ambassador

Remember the Voyager missions of the 1970s and 1980s? Missions that were planned to last just five years are celebrating their 30th anniversary now. Alive and well, Voyager 1 and 2 are about to cross into interstellar space, providing us with information about this never-before-explored region of space.

The twin craft became a fixture of pop culture, playing a central role in novels, television shows, music videos, songs, and movies from the 1980s and 1990s. Many of these fictional works focused on what would happen if an alien race were able to locate Earth via Voyager's famous golden records, which include sounds and images of and how to locate our home planet.

Voyager 1 and 2 continue exploring where nothing from Earth has flown. They each are much farther away from Earth and the Sun than Pluto is, and approaching the boundary region — the heliopause — where the Sun's dominance of the environment ends and interstellar space begins. Voyager 1, more than three times as distant as Pluto, is farther from Earth than any other human-made object and speeding outward at more than 17 kilometers per second (38,000 mph). Both spacecraft are still sending scientific information about their surroundings through the Deep Space Network (DSN).

The primary mission was the exploration of Jupiter and Saturn. After making amazing discoveries there — such as active volcanoes on Jupiter's moon Io and intricacies of Saturn's rings — the mission was extended. Voyager 2 went on to explore Uranus and Neptune, and is still the only spacecraft to have visited those outer planets. The adventurers' current mission, the Voyager Interstellar Mission (VIM), will explore the outermost edge of the Sun's domain, and beyond.

To see the current location of the Voyager spacecraft, visit [http://heavens-above.com/solar-escape.asp/?/](http://heavens-above.com/solar-escape.asp?/) where you will also discover the locations of the Pioneer craft.

**Resource of the Month:** Each day I receive the *CNET Download Dispatch* in my inbox. The August 24 edition mentioned astronomy-related software and web-related resources. The author recommended Google Earth's new Sky View feature. Find review of GE-SV as well as the programs Celestia and Stellarium, and web-planetaria Sky-map.org, WikiSky, and YourSky at [http://www.download.com/8301-2007\\_4-9764531-12.html?tag=nl\\_e415](http://www.download.com/8301-2007_4-9764531-12.html?tag=nl_e415) . Check out the BBC's review of GE-SV at <http://news.bbc.co.uk/2/hi/technology/6955787.stm> .

This issue of the newsletter also mentioned the five most popular “galactic downloads” from its site during the week of Aug. 24. They are:

1. [Google Earth](#) - Sky View adds the entire universe to Google's sphere of influence
2. [SETI@home](#) - Analyze data captured by radio telescopes to search for extraterrestrial intelligence with this networked screensaver. (*I am now running this on one of our computers. It uses a program called BOINC. With BOINC one may link to a number of other scientific projects. I have also signed up with Einstein@home that looks for pulsars. Download the BOINC software from <http://boinc.berkeley.edu/>. MRB*)
3. [Stella 2000](#) - Explore the night sky and search for planets, comets, asteroids, deep sky objects, and stars.
4. [Stellarium](#) - Turn your PC into a virtual telescope and watch the night sky from your desktop.
5. [Planet Quest](#) - Zoom through the depths of the galaxy. Planet Quest takes you on a 3D desktop voyage past cloud-shrouded planets, glowing stars, and rings of cosmic debris.

→ I am still looking for input on your favorite astronomy-related software, websites, and other resources. Please e-mail them to me and I can make them available to everyone who reads this column.

**Activity of the Month:** Learn about *gravity assist*, a method whereby a spacecraft uses the gravity on a planet to change its trajectory and increase its speed while using little or no fuel. Voyager 2 used this technique to allow it to visit the outer planets of Uranus and Neptune. Gen-

eral information may be found at <http://www2.jpl.nasa.gov/basics/bsf4-1.html> . While this page includes a link to building a model to illustrate gravity assist, an easy demonstration that requires only a few people can be found at <http://spaceplace.nasa.gov/en/educators/gravityassist.pdf> .

Suggestions, questions, and comments about “Planetary Wonderings” are welcomed and may be directed to stargazer @ keeplookingup.net (remove spaces). Past columns may be found at [www.keeplookingup.net](http://www.keeplookingup.net) (click on “Planetary Wonderings” on the right side of opening screen).

**Remember to *keep looking up!***

Sources (not previously mentioned): <http://voyager.jpl.nasa.gov/index.html>