

## **Planetary Wonderings**

### **June Focus: EPOXI**

**By Mary-Frances Bartels, NASA Solar System Ambassador**

What do you use when you need a really strong glue to hold two things together? Or, what is formed when one mixes resin and hardener? What do you get when you combine two missions into one spacecraft? Epoxy/EPOXI!

Remember the Deep Impact mission? That is the mission to a comet that released a “lander,” called an “impactor,” that intentionally crashed onto the surface of comet Tempel 1 in July 2005. Just prior to crashing, the impactor took pictures of the comet’s nucleus. Meanwhile, the Deep Impact flyby spacecraft observed and recorded data from the impact. Since then scientists have learned more about the composition and geology of comets. Though this successful mission officially ended in August 2005, the spacecraft lived on and is now being used by two different and brand new projects.

The first project is called DIXI., which stands for Deep Impact eXtended Investigation. DIXI will use the surviving Deep Impact spacecraft and its three working instruments ---two color cameras and an IR spectrometer --- to study the nature of cometary structure and composition. Originally it was to study comet Boethin in December of this year, but the target was changed to Hartley 2 when the former could no longer be located. The spacecraft is scheduled to flyby this comet in October 2010.

Along the way to Comet Hartley 2 the Deep Impact spacecraft is performing science for the Extrasolar Planet Observation and Characterization (EPOCh) project. EPOCH has begun to observe stars that have known transiting giant planets and search those stars for previously undiscovered planets. EPOCH also will search for evidence of rings and moons associated with the known giant planets of the targeted stars. Some properties of interest include the reflectivity (albedo) of extrasolar planets. In addition to studying extrasolar planets, EPOCH will observe the Earth at both visible and infrared wavelengths. These data will help scientists understand what an Earth-like planet might look like if it were orbiting a distant star. The data will help in making computer models of planetary images that are not so Earth-like, and will guide future efforts to detect and study extrasolar planets directly.

These two projects, DIXI and EPOCH, together have been christened EPOXI. Reusing the Deep Impact craft in this way allows for much more science to be done for about 15% of the cost of starting from scratch. It should be noted that Stardust (featured in *PW*, Jan. '06 issue), which visited comet Wild 2 in January 2004, has also been reassigned. Its new mission is called New Exploration of Tempel 1 (NExT) and will visit Deep Impact’s comet --- Tempel 1 --- in February 2011. Both Deep Impact and Stardust, as well as their new “incarnations,” are part of NASA’s Discovery Program (<http://discovery.nasa.gov>). The Discovery Program concentrates in low-cost, highly-focused planetary science investigations designed to enhance understanding of the solar system.

**Resource of the Month:** Subscribe to the EPOXI newsletter at <http://epoxi.umd.edu/6outreach/newsletter.shtml> .

**Activity of the Month:** The summer solstice, a.k.a. the beginning of summer, occurs this year on June 20 at 7:59 PM EDT. Hot summer days make me think of ice cream. I found this activity, called *Make a Comet Model and Eat It* at [http://solarsystem.nasa.gov/educ/docs/Make\\_A\\_Comet.pdf](http://solarsystem.nasa.gov/educ/docs/Make_A_Comet.pdf) . It is for grades 2 – 9 and includes an exercise where the student makes ice cream. Another is called “The Chemistry and Thermodynamics of Ice Cream” and explores the structure of a butterfat molecule.

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) (all past columns, click on “Planetary Wonderings” on the right side of opening screen) and at <http://www.freelists.org/archives/astromyed/> (columns from Jan. 2007 to the present).

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

Sources (not mentioned in article): <http://www.physorg.com/pdf81527510.pdf>  
[http://www.nasa.gov/mission\\_pages/epoxi/index.html](http://www.nasa.gov/mission_pages/epoxi/index.html)  
<http://epoxi.umd.edu/>  
<http://solarsystem.nasa.gov/deepimpact/mission/factsheet-text.cfm>