

Astronomers track long, strange voyage of distant planet

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(PhysOrg.com) -- University of Pittsburgh planet hunters based at the Allegheny Observatory were one of nine teams around the world that tracked a planet 190 light-years from Earth making its rare 12-hour passage in front of its star. The project resulted in the first ground-based observation of the entire unusually drawn out transit and established a practical technique for recording the movement of other exoplanets, or planets outside of Earth's solar system, the teams reported in *The Astrophysical Journal*.

The Pitt team, led by Melanie Good, a graduate student of physics and astronomy in Pitt's School of Arts and Sciences, observed the planet HD 80606b for more than 11 hours on Jan. 10 as it passed in front of its star, HD 80606, located more than 1.14 quadrillion miles from Earth in the constellation Ursa Major. The Pitt group included Michael Wood-Vasey, a professor of physics and astronomy; Louis Coban of the Allegheny Observatory; and physics and astronomy undergraduate students Shane Cerutti, Korena Costello, Maya Hunt, Gary Lander Jr., Eric Roebuck, Chelsea Vincent, and Gwendolyn Weaver, all part of Good's research group, Survey of Transiting [Extrasolar Planets](#) at the University of Pittsburgh, or STEPUP.

HD 80606b is among the strangest of the 500 exoplanets yet discovered, Good said. Approximately four times the size of Jupiter, the gaseous planet is scorchingly close to its star and follows an oblong orbit similar to that of Halley's Comet. At its farthest, the planet is almost as far from its star as the Earth is from the Sun, while at its closest, it is just 3

percent of that distance so that the planet's temperature jumps thousands of degrees as it nears HD 80606. And while most exoplanets complete their transit within a few hours, HD 80606b traipses along for nearly 12—and only makes the trip every 16 weeks.

Both characteristics of HD 80606b's transit make it difficult for a single observatory to observe all of it, according to the article in [The Astrophysical Journal](#). Coordinated by the Massachusetts Institute of Technology and the University of California at Santa Barbara, the nine-team project demonstrated that multiple observatories working together can capture such long transits in their entirety.

As HD 80606b moved, the research groups recorded the transit from their respective vantage points. The data was then combined to reveal unknown information about the planet, such as its mid-transit point and the precise transit duration. The effort included teams working from the Wise Observatory in Israel; the Gran Telescopio Canarias in the Canary Islands; Observatoire de Haute Provence in France; Rosemary Hill Observatory in Florida; the Fred Lawrence Whipple Observatory in Arizona; the Table Mountain Observatory in California; the George R. Wallace Jr. Astrophysical Observatory in Massachusetts; and the Faulkes Telescope North in Hawaii.

In addition to the HD 80606 project, Pitt's STEPUP team has tracked the transit of approximately half a dozen extrasolar planets in the past six months, Good said. Group members also are helping make upgrades to the Allegheny Observatory that will allow them to use and control the Observatory's 30-inch Thaw telescope from Pitt's Oakland campus.

More information: Journal paper:
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