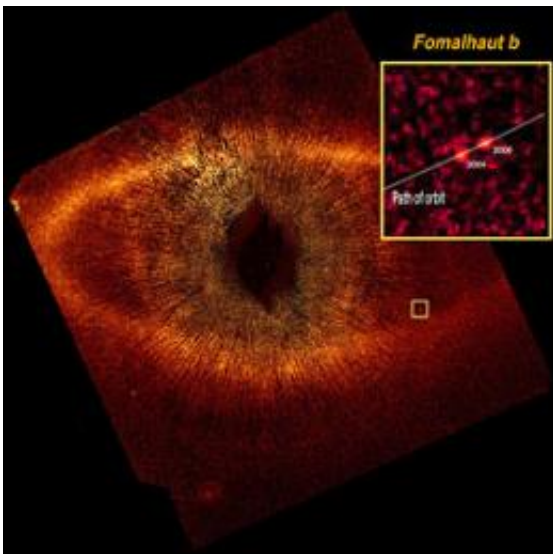


Images of extrasolar planets win award for most outstanding papers in Science

February 19 2010, By Robert Sanders



Fomalhaut is a bright star 25 light years from Earth. This image, with light from the central star blocked, shows a vast belt of comet dust that is shaped by the gravitational influence of the exoplanet Fomalhaut b. (Paul Kalas/NASA/ESA)

(PhysOrg.com) -- UC Berkeley astronomers and their team of planetary paparazzi have garnered the 2009 Newcomb Cleveland Prize of the American Association for the Advancement of Science, for the most outstanding paper published in the journal Science.

A picture is worth a thousand words, or so University of California, Berkeley, astronomer Paul Kalas found out when he published a [Hubble Space Telescope](#) image of a Jupiter-sized planet orbiting the star

Fomalhaut.

Since it appeared in the journal *Science* in November 2008, "the image of Fomalhaut, its visually striking belt of [comet dust](#) and its planet has become an iconic image of a planetary system," said Kalas, an adjunct associate professor of astronomy at UC Berkeley.

National Geographic magazine ran a full-page fold-out of the image in its December 2009 issue, while Life's new glossy book, "Wonders of the World," includes the image among its many classic photos.

Now, that image and the paper in which it was published has won Kalas and his team of planetary paparazzi the 2009 Newcomb Cleveland Prize of the American Association for the Advancement of Science (AAAS) for the most outstanding paper published in *Science* between June 1, 2008, and May 31, 2009. Founded in 1848, the AAAS is the world's largest general scientific society and the publisher of *Science*.

"The Fomalhaut image was the first visible-light picture of an extrasolar planet out of the more than 300 planetary systems known to exist," Kalas said.

Kalas and colleagues from UC Berkeley, Lawrence Livermore National Laboratory (LLNL), the Jet Propulsion Laboratory in Pasadena (JPL) and the Goddard Space Flight Center will share the bronze medal and \$25,000 purse with a team led by Christian Marois, a former UC Berkeley post-doctoral fellow now at the Herzberg Institute of Astrophysics in Victoria, British Columbia, Canada. That team simultaneously published images of three planets orbiting the star HR 8799. Both papers appeared online Nov. 13, 2008.

"This is the first time this award has been given in the field of astronomy since 1999," Kalas said. "Considering the number of papers that *Science*

publishes weekly on many vital scientific topics, it's a tremendous honor to be selected this year."

"These two papers are landmark discoveries, as they report the first definitive, direct imaging of exoplanets: the planets that orbit distant stars," said Bruce Alberts, Science editor-in-chief. "They result from remarkable technical advances in both imaging and data analysis, which make it possible to separate a planet from its host star. The results are likely to change our view of how planets originate. The ultimate goal is the direct imaging of Earth-like planets, so as to search for biosignature gases. This task will be very much harder, since such planets will not only be considerably smaller and dimmer, but also much closer to a sun-like star. Nevertheless, with this first giant step, it does not appear impossible."

The prize, awarded annually since 1923, is the oldest prize given by the AAAS and is now supported by Affymetrix, a company based in Santa Clara, Calif., that makes microarrays and other gene-analysis tools based on semiconductor technology. It will be presented to the astronomers on Saturday, Feb. 20, at a ceremony during the association's annual meeting in San Diego, Calif.

Marois and his team employed adaptive optics on the Keck and Gemini North telescopes on Mauna Kea in Hawaii to obtain images of the three Jupiter-sized planets orbiting the star HR 8799, located about 128 light years from Earth.

Kalas and his team used the Hubble Space Telescope's Advanced Camera for Surveys to image the dust belt around Fomalhaut, which is 25 light years from Earth. The optical images, obtained in 2004 and 2006, show a belt of dust and debris surrounding the star and a planet that orbits the star every 872 years and sculpts the inner edge of the belt.

Now, following last year's refurbishing of the Hubble Space [Telescope](#) and repair of the Advanced Camera for Surveys, Kalas and his team plan to continue their studies of the dust disk surrounding Fomalhaut.

Authors of the paper, "Optical Images of an Exosolar Planet 25 Light-Years from Earth," include James R. Graham and Eugene Chiang, UC Berkeley professors of astronomy; Edwin S. Kite, a UC Berkeley graduate student; Michael P. Fitzgerald from the Institute of Geophysics and Planetary Science at LLNL in California; Mark Clampin of the Exoplanets and Stellar Astrophysics Laboratory at the Goddard Space Flight Center in Greenbelt, Md.; Karl Stapelfeldt and John Krist of JPL at the California Institute of Technology; and Marois.

Both the [Kalas paper](#) and the [Marois paper](#), "Direct Imaging of Multiple Planets Orbiting the Star HR 8799," can be found online. (Please note that these articles are freely accessible, but initial registration may be required.)

Provided by University of California - Berkeley

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