NASA's SOFIA captures images of the planetary nebula M2-9

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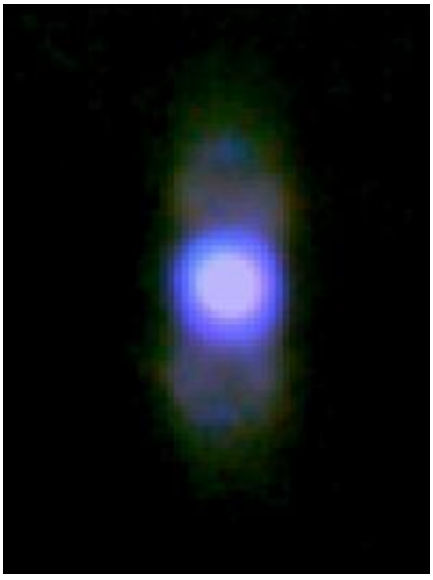

NASA's Stratospheric Observatory for Infrared Astronomy (SOFIA) recently captured this color-composite image of the planetary nebula Minkowski 2-9 (M2-9) showing a dying sun-like star. The observations were made using the Faint Object Infrared Camera for the SOFIA Telescope (FORCAST) instrument, and is composed of images shot at the mid-infrared wavelengths of 20, 24, and 37 microns, of which 37 microns cannot be seen by ground-based telescopes. (NASA/DLR/USRA/DSI/FORCAST team/M. Werner, J. Rho)

(PhysOrg.com) -- Researchers using NASA’s Stratospheric Observatory for Infrared Astronomy (SOFIA) have captured infrared images of the last exhalations of a dying sun-like star.

The object observed by SOFIA, planetary nebula Minkowski 2-9, or M2-9 for short, is seen in this three-color composite image. The SOFIA observations were made at the mid-infrared wavelengths of 20, 24, and 37 microns. The 37-micron wavelength band detects the strongest emissions from the nebula and is impossible to observe from ground-based telescopes.

Objects such as M2-9 are called planetary nebulae due to a mistake made by early astronomers who discovered these objects while sweeping the sky with small telescopes. Many of these nebulae have the color, shape and size of Uranus and Neptune, so they were dubbed planetary nebulae. The name persists despite the fact that these nebulae are now known to be distant clouds of material, far beyond our solar system, that are shed by stars about the size of our sun undergoing upheavals during their final life stages.

Although the M2-9 nebular material is flowing out from a spherical star, it is extended in one dimension, appearing as a cylinder or hourglass. Astronomers hypothesize that planetary nebulae with such shapes are produced by opposing flows of high-speed material caused by a disk of material around the dying star at the center of the nebula. SOFIA's observations of M2-9 were designed to study the outflow in detail with the goal of better understanding this stellar life cycle stage that is important in our galaxy's evolution.

"The SOFIA images provide our most complete picture of the outflowing material on its way to being recycled into the next generation of stars and planets," said Michael Werner of NASA's Jet Propulsion Laboratory (JPL) in Pasadena, Calif., principal investigator of these observations. "We were gratified to see the lobes so clearly using SOFIA. These early results demonstrate the scientific potential of this important new observatory."

The observations were made using the Faint Object Infrared Camera for the SOFIA Telescope (FORCAST) instrument in June 2011 by a team consisting of astronomers from JPL/Caltech, UCLA, Cornell University and Ithaca College, Ithaca, N.Y. Preliminary analyses of these data were first presented in January 2012 at the American Astronomical Society meeting in Austin, Texas.

SOFIA is a Boeing 747SP aircraft extensively modified to carry a 17-ton reflecting telescope with an effective diameter of 2.5 meters (100 inches) to altitudes as high as 45,000 feet (14 km), above more than 99 percent of the water vapor in Earth's atmosphere that blocks most infrared radiation from celestial sources.

Provided by JPL/NASA