

LOWELL OBSERVATORY

**PRESS RELEASE
FOR IMMEDIATE RELEASE
July 9, 2015**

Image attached

Unraveling Pluto's Mysteries

Five Astronomers from Lowell Observatory, with help from supporting institutions take to the sky to unlock some of the many mysteries surrounding Pluto.

Flagstaff, Az- Last week, 27 years after Lowell Observatory astronomers directly detected Pluto's atmosphere for the first time, Pluto came one step closer to revealing its mysteries this past week. Astronomers from Lowell Observatory, MIT, UCLA, and the University of Stuttgart watched Pluto from an altitude of 39,000 ft in the skies south of New Zealand using SOFIA (the Stratospheric Observatory for Infrared Astronomy, a joint project of NASA and the German Aerospace Center DLR). At the same time, other astronomers spread out across New Zealand and Australia to capture the Pluto occultation. Their mission was to gather data during this occultation to get a better understanding of how Pluto's atmosphere changes as it gets further from the sun.

Local astronomers played important roles in making this mission possible. Getting an airborne observatory into the exact center of Pluto's shadow required a lot of teamwork. At Lowell, in a room temporarily appropriated and renamed "Pluto Occultation Mission Control" (fittingly, just across the hall from what was Clyde Tombaugh's office), Amanda Bosh (MIT/Lowell) and Carlos Zuluaga (MIT) worked late into the night analyzing data taken by colleagues at Lowell's Hall and Discovery Channel telescopes, the Naval Observatory's 1.55-m Strand telescope, and the 24-inch SARA (Southeastern Association for Research in Astronomy) telescope on Cerro Tololo, Chile. These critical data were turned into updated prediction paths and relayed to SOFIA flight planners.

Aboard SOFIA, Michael Person (MIT) coordinated with the three instrument teams who would be collecting data during the event. Lowell Observatory astronomers Ted Dunham, Tom Bida, and Peter Collins were all aboard to ensure that one of these instruments, HIPO (a dual channel, high-speed occultation camera) performed well during this event.

While SOFIA was flying above the clouds, many teams were on the ground in New Zealand and Australia, hoping for a clearing of the weather so they could observe this event. Stephen Levine (Lowell) was on the ground in New Zealand at the Mt. John University Observatory, using a special infrared camera loaned by

Henry Roe (Lowell) for this event. Larry Wasserman (Lowell) was also in New Zealand to observe this event. Colleagues from Williams College, the South African Astronomical Observatory, Steward Observatory, and many others were stationed throughout New Zealand and Australia, ready to capture this rare event.

About five hours before the occultation, while SOFIA was already in the air, final data came in and the astrometry team at Lowell Observatory made last minute calculations to conclude that SOFIA needed to change course by more than 300 km (185 mi). "This was a larger course correction than we were expecting," said Bosh, "but the flight crew aboard SOFIA were on it and were able to make it happen." The result of this maneuvering was a central flash, a temporary brightening of the star when it is still behind the planet, due to focusing of the starlight by the planet's atmosphere. Central flashes are observed only when the alignment of the star, Pluto, and the observer is very precise, and are sought after by occultation observers because it reveals the structure of the lower atmosphere that is normally not seen during an occultation.

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About Lowell Observatory

Lowell Observatory is an independent, non-profit research institution founded in 1894 by Percival Lowell. The Observatory has been the site of many important discoveries including the detection of the large recessional velocities (redshift) of galaxies by Vesto Slipher in 1912-1914 (a result that led ultimately to the realization the universe is expanding), and the discovery of Pluto by Clyde Tombaugh in 1930. Today, Lowell's 14 astronomers use ground-based telescopes around the world, telescopes in space, and NASA planetary spacecraft to conduct research in diverse areas of astronomy and planetary science. The Observatory welcomes 80,000 visitors each year to its Mars Hill campus in Flagstaff, Arizona for a variety of tours, telescope viewing, and special programs. Lowell Observatory currently operates four research telescopes at its Anderson Mesa dark

sky site east of Flagstaff and the 4.3-meter Discovery Channel Telescope near Happy Jack, Arizona.