

SOFIA

Science e-Newsletter



April 2018

In this issue:

- SOFIA Return to Flight Delayed
- SOFIA Next Generation Instrument Call for Proposals
- Cycle 6 Science
- SOFIA Workshop Slated for May 2-4 in Stuttgart, Germany

SOFIA Return to Flight Delayed: March 30 Update

Updated March 30, 2018

NASA's Stratospheric Observatory for Infrared Astronomy, SOFIA, remains in Hamburg, Germany, to address a repair that was discovered during a routine inspection and repair cycle, known as a C-Check.

The observatory was slated to return on Jan. 8, 2018, however, after completion of the inspection and maintenance by technicians at Lufthansa Technik AG, a fuel leak was discovered where the outer engine on the left side attaches to the wing. To return to flight operations, the wing fuel-tank leak must be addressed in accordance with safety requirements.

As a result of this issue, Boeing, the aircraft's manufacturer, has directed that all four engine pylon locations be examined. To accomplish this, some internal parts of the wing must be removed to gain access for inspection and repair of identified fuel tank leaks. The repair process will involve removal of sealant, structural repair, re-application of sealant, reassembly of the internal wing structure, and leak-testing of all wing tanks. It is anticipated that this work will take five weeks to accomplish.

Following a functional check flight, the ferry flight back to the United States is not expected before May 8. SOFIA will resume science flights shortly after its return to NASA Armstrong Flight Research Center's aircraft operations facility in Palmdale, California.

Impacts to the observatory's science schedule are currently being assessed. The observatory's science schedule is currently being re-planned and the new science program will be started when SOFIA returns to flight operations. The new science program will include contingency flight dates built into SOFIA's schedule.

SOFIA Next Generation Instrument Call for Proposals

With its ability to soar above 99 percent of the Earth's atmospheric water vapor only to touch down for enhancements hours later, SOFIA is a uniquely versatile airborne,

infrared observatory. The High-resolution Airborne Wideband Camera-Plus (HAWC+) formally completed its instrument acceptance review in late 2017, expanding SOFIA's domain to include polarimetry and filling a much-needed observing gap for the astronomy community. The High Resolution Mid-Infrared Spectrometer (HIRMES) is currently in development and expected to begin observations in 2019, providing coverage between 25 and 122 microns with a spectral resolution ranging between 325 and 100,000.

What's next for SOFIA? You tell us! NASA released the SOFIA Next Generation Instrument Call for Proposals on March 6, 2018 (ROSES-18 D1.14) to fund the development of new instrumentation or implement upgrades to existing instruments for the observatory.

The deadline for proposal submission is August 1, 2018. Three workshops will be held on April 3, April 16, and May 17, 2018, to aid in proposal submission. More details at: <https://www.sofia.usra.edu/science/instrument-call>

View the NSPIRES solicitation here: [D1.14. NNH18ZDA001N-SOFIA](#)

Up, Up, and Away!

Cycle 6 features exciting science across the board for the SOFIA instrument suite! Highlighted below are select Cycle 6 observing programs from each instrument, poised to explore fundamental modern astrophysical topics.

EXES: Hot Core Astrochemistry

The Echelon-Cross-Echelle Spectrograph (EXES) will exercise its capacity for high spectral resolution spectroscopy by probing the organic inventory of the hot core of the massive protostar AFGL 2136 at 5.4-6.4 micron with $R \approx 50,000$ and a S/N ~ 100 . This will add to previous EXES and Texas Echelon Cross Echelle Spectrograph (TEXES) research utilizing both SOFIA and Gemini, culminating in complete infrared spectra of two hot cores from 4.5-13 micron!

PI: Alexander Tielens, [Proposal ID: 06_0017](#)

FIFI-LS & FORCAST: Accretion Burst of High Mass Young Stellar Object

In November 2015, SOFIA completed the first ever detection of an accretion burst of a high-mass young stellar object, S255IR-NIRS3. The outburst confirmed the disk accretion component of massive star formation and associated disk instabilities. In Cycle 6, Field Imaging Far-Infrared Line Spectrometer (FIFI-LS) and the Faint Object InfraRed CAMERA for the SOFIA Telescope (FORCAST) will examine the dimming of the spectral energy distribution (SED) due to the accretion burst to further probe both the formation process of massive stars and the physics of their circumstellar disks.

PI: Bringfried Stecklum, [Proposal ID: 06_0182](#)

FPI+: Catching the Titan Occultation

SOFIA's mobility will be crucial to catch upcoming stellar occultations of Titan. This is particularly critical with the end of the Cassini/Huygens mission in September 2017. The Focal Plane Imager-Plus (FPI+) will be used to measure the radial profile of Titan's atmosphere compared to previous observations to determine if significant seasonal variations exist.

PI: Michael Person, [Proposal ID: 06_0160](#)

GREAT: Molecular Hydrogen Fraction in ISM

The molecular hydrogen fraction provides the relationship between atomic and molecular gas in the galactic interstellar medium (ISM). In an effort to add to our understanding of the diffuse ISM, the heterodyne spectrometer German Receiver for Astronomy at

Terahertz Frequencies (GREAT) will provide key constraints on the molecular hydrogen fraction by observing diffuse molecular clouds at 1.444 and 1.442 THz.

PI: David Neufeld, [Proposal ID: 06_0017](#)

HAWC+: Polarimetry of Protostellar Disks

A collaborative polarimetry investigation between HAWC+ and the Atacama Large Millimeter Array (ALMA) will test theories addressing the puzzle of the magnetic braking catastrophe: why magnetic forces fail to funnel all disk material directly into the nascent star as expected. HAWC+ will observe eight young protostars in Ophiuchus, tracing magnetic fields nearly continuously over more than four orders of magnitude in spatial scale to determine the significance of magnetic field misalignment on the formation mechanism of protostellar disks.

PI: Giles Novak, [Proposal ID: 06_0116](#)

SOFIA Workshop Slated for May 2-4 in Stuttgart, Germany

The German SOFIA Workshop is accepting participant registration. The workshop will be held May 2-4, 2018, at the University of Stuttgart in Stuttgart, Germany. The focus of the workshop is to cover the current status of the observatory, discuss recent results, and help users write successful proposals. Space is limited to 60 participants, so register soon:

<https://conference.dsi.uni-stuttgart.de/event/1/>

Stay tuned for upcoming SOFIA workshops:

<https://www.sofia.usra.edu/science/meetings-and-events/events/workshops>

Please feel free to direct questions and comments to the SOFIA Science Center help desk: sofia_help@sofia.usra.edu.

