

SOFIA

Science Newsletter



April 2020

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Flash Funding Call for Betelgeuse Archival Research

To understand the nature and characteristics of Betelgeuse's unprecedented dimming, SOFIA observed the star in the winter and spring of 2020 as follows:

- EXES: Observed about 50 minutes total, centered on the [Fe II] line 25.9884 microns and [S I] at 25.2516 microns, also including water features at 25.32 microns.
- FIFI-LS: Observed about 45 minutes covering [O I] 63 microns, [O I] 145 microns, [C II] 157 microns and a number of CO lines.
- GREAT: Observed about 1 hour covering the [OI] 63 microns and [C II] 157 microns lines.

These data have no exclusive use period and are publicly available through the [IRSA archive](#). Funding from the Science Center is available to support the analysis and publication of one or more of these publicly available data sets.

Proposals are invited through an "Archival Research Flash Call" for Betelgeuse research before April 24, 2020. Details are available on the [Science Center website](#).

Funding for research using other archival data is available through [NASA ROSES-ADAP](#). That deadline is June 30, 2020.



Credit: ESO/M. Montargès et al.

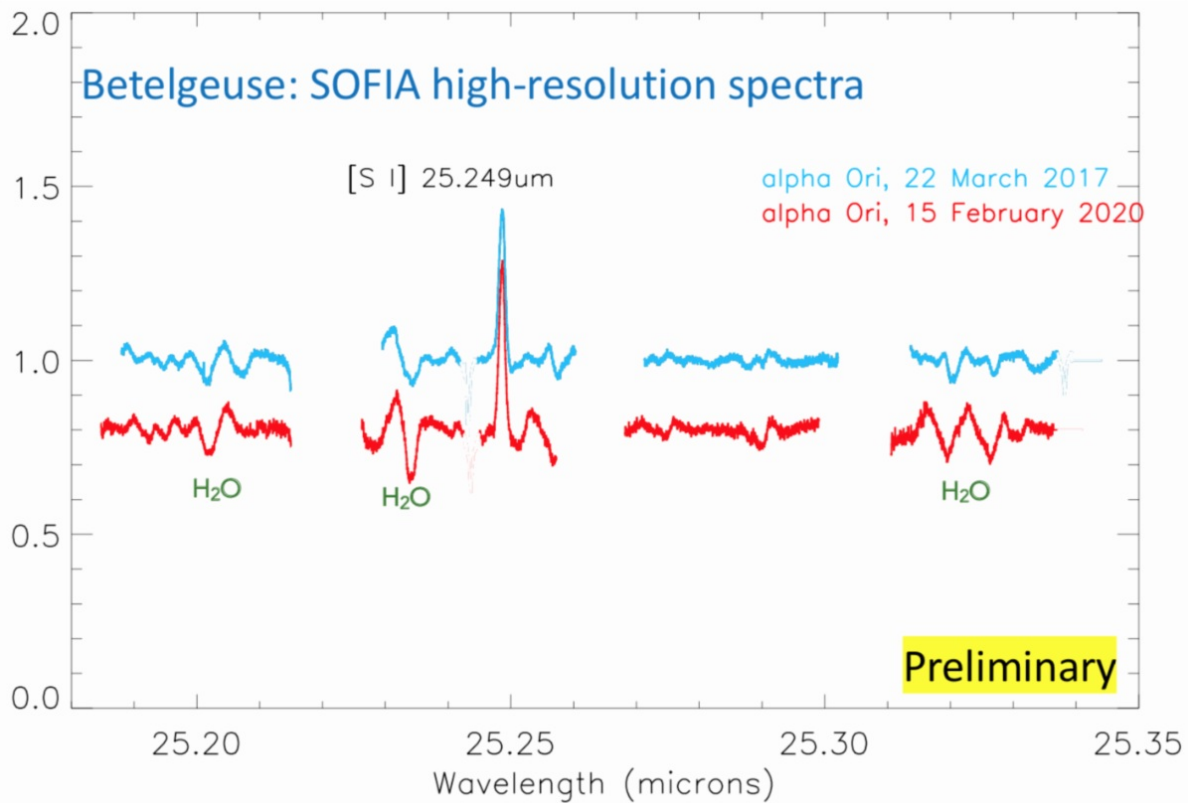
Betelgeuse in January and December 2019, captured by the European Southern Observatory (ESO) Very Large Telescope (VLT)

Featured Public Archival Dataset: Betelgeuse High Resolution 25 Micron Spectra 2015-2020

An observing program was executed close to the Betelgeuse's V-band minimum in February 2020 under several Director's Discretionary Time (DDT) programs.

These observations obtained with the EXES instrument were focused on high-spectral resolution spectra around 25 microns, encompassing forbidden [Fe II], [S I] and two water absorption features. Similar data were already obtained in 2015 and 2017, allowing evaluations of variations in line flux and width over time, with sufficient resolution ($R \sim 50000$) to identify gas velocity changes.

Preliminary data appear to show that the water features at 25.24 microns are significantly deeper in 2020 compared to 2017. However, modeling is needed to confirm the celestial origin of the variation of the water features.



Graham Harper, University of Colorado Boulder, and his team demonstrated that [Fe II] and [S I] emission lines, originating from circumstellar regions well above the photosphere, display no significant change from 2015 to 2020 (paper accepted for publication in [ApJL](#)). Their results suggest that while dust heating can be very sensitive to photometric variations, circumstellar gas in the regions probed by [Fe II] and [S I] lines may not be significantly heated by dust.

All EXES Betelgeuse calibrated data, including from 2020 observations, are publicly available on the [IRSA archive](#) under program IDs 75_0051, 05_0073, and 02_004.

An "Archival Research Flash Call for Proposals" for funding to support research using SOFIA Betelgeuse data is also [open](#).

Response to COVID-19

In response to COVID-19, observations will be temporarily suspended effective Thursday, March 19, 2020 to ensure the safety of all staff and to comply with state and local county orders.

While we are not conducting science observations at this time, the Science Center remains active.



Services such as data pipeline operations, the Helpdesk, and user support are fully functioning. We will provide further updates about the status of the observatory as we know more.

Transition to IRSA Archive Complete

The science archive recently completed its transition to the Infrared Science Archive (IRSA) hosted by the Infrared Processing & Analysis Center (IPAC) as its primary data archive.

Data from observing cycle 1 onwards are now searchable through the [IRSA SOFIA Archive](#), including:

- Archival data that is publicly available
- Proprietary data that is only available to guest observers and delegated users

Video tutorials about searching the IRSA archive for SOFIA data and using the visualization features are [available online](#). Questions can be directed to the [IRSA help desk](#). Luisa Rebull (IPAC) will give a teletalk on the IRSA archive for SOFIA data on April 15th ([see details](#)).



New Data Cycle System Feature: Proposal Tracking

The Data Cycle System (DCS) managed by the SOFIA Science Center will no longer act as a data archive because the transition to IRSA is complete. However, the DCS continues to be the main interface for:

- Planning observations
- Submitting observing proposals (Phase 1 Proposals)





- Modifying approved observing programs (Phase 2 Proposals)
- Tracking the status of observing programs (*new*)

New DCS feature includes tracking your program from proposal submission to completed data products.

How to track your project:

1. Log into the [DCS](#) and click on "My Proposal."
2. The status and progress of all your programs will appear.
3. Projects are categorized as "phase 1," "phase 2," "flights planned" and flights flown.
4. Data products for completed programs are included.

Welcome to the SOFIA Data Cycle System!

User Support	Proposal Development	Observation Planning	Data Archive & Retrieval
 <p>About DCS Register With DCS DCS Help Resources DCS Development Documentation</p>	 <p>Download USPOT My Proposals - New! Search Proposals Search Duplicate Observations SOFIA Instrument Time Estimator ATRAN</p>	 <p>Track Observing Plans - <i>New!</i> Search AORs Search ObsBlocks/Legs Search Flight Plans Search Cycle Schedules Download Visibility Tool</p>	 <p>Data Ingestion Status Search Science Archive Search Mission Data Archive Search MCCS HK Data Create Mission Search Missions MOPS Flights/Missions SOFIA Publications Archive Usage</p>

The SOFIA Data Cycle System (DCS) provides tools and infrastructure for both General Investigators (GIs) and Science and Mission Operations (SMO) staff for:

- proposal preparation and submission
- observation and mission planning

Join Science Talks Remotely: Tele-Talks & Colloquia

Tele-Talks are scientific presentations given via phone, with slides distributed ahead of time. The talks are held approximately twice a month on Wednesdays at 9:00 a.m. Pacific, noon Eastern. For information on how to participate in the Tele-Talks, please check the [SOFIA Tele-Talk webpage](#).

Upcoming Tele-Talk Schedule

- April 15: How to Use the SOFIA Science Data Archive at IRSA; Luisa Rebull (IPAC)
- May 6: SOFIA/FORCAST Galactic Center Legacy Survey; Matt Hankins (Caltech)
- May 27: Dust Production in Carbon Stars; Kathleen Kraemer (Boston College)
- June 3: Carbon Chains Toward SgrB2; Thomas Geisen (University of Kassel)
- June 25: Optical Depth in [C II]; Christian Guevara (University of Cologne)

Virtual Colloquia

The SOFIA Colloquia will now take place virtually via WebEx on Wednesdays at 3:30 p.m. Pacific. More information about how to participate is available on the [Colloquia webpage](#).

Upcoming Colloquia Schedule

- April 15: Gina Panopoulou (Caltech); 3D Mapping of the Dusty, Magnetized

ISM with Starlight Polarization

- April 22: Uma Gorti (NASA Ames)
 - May 13: Chris Theissen (University of California San Diego)
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Please direct questions and comments to the SOFIA Science Center help desk:
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