

# SOFIA

## Science Newsletter

October 2020

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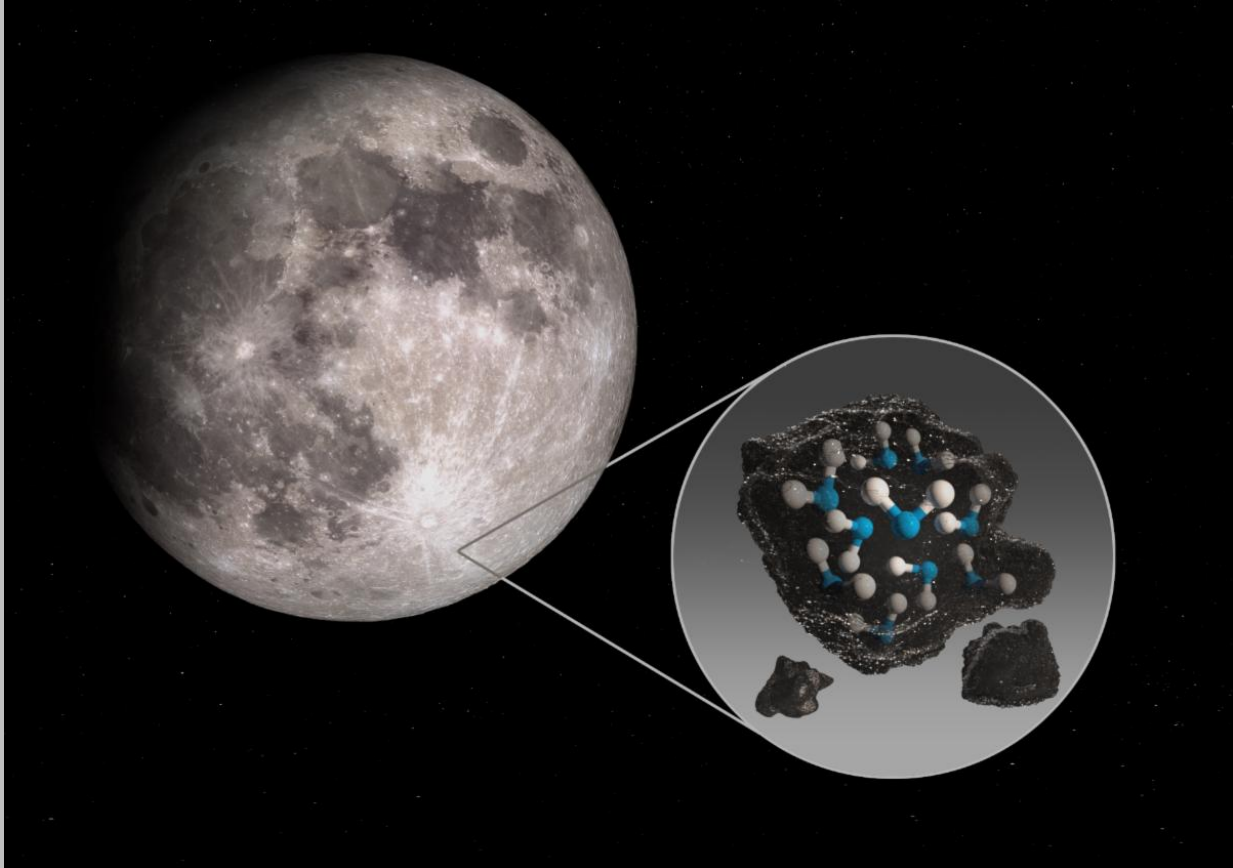
## Science Spotlight

### **SOFIA Detects Water on the Moon**

Researchers using SOFIA have made the first-ever detection of the water molecule on the sunlit surface of the Moon. This discovery refines our understanding of the behavior of water and how volatile elements and compounds interact with airless bodies. Volatiles can influence the internal processes and surface expression of planets. In particular, water suppresses the melting point of rock, promoting volcanism, and reduces the viscosity of planetary interiors, enabling more efficient internal circulation and heat transfer.

Water has been detected previously in trace amounts in the lunar exosphere and in sparse occurrences as ice in permanent shadow at the lunar poles. The team led by C. Honniball (NASA Goddard/USRA) used SOFIA to target sunlit high lunar latitudes near the South Pole, where the low temperatures could allow migrating water to transiently remain on the surface. Thanks to the sensitivity of the FORCAST spectrometer, the team found water abundances of a few hundred parts per million, which is high by lunar standards.

[Read more.](#)



This illustration highlights the Moon's Clavius Crater in the southern hemisphere, where traces of water were detected by NASA's airborne observatory SOFIA. This is the first time water has been found on the sunlit surface of the Moon. The call-out depicts water molecules trapped inside tiny, glass bead-like structures within the lunar soil. These structures may prevent water from being lost to space, allowing it to remain on the harsh, airless lunar surface. NASA/Ames Research Center/Daniel Rutter.



### **Monday, October 26**

#### **DPS Webinar: Lunar Observations from SOFIA: Recent Results and Next Plans**

Attendees of the [52nd DPS Meeting](#) will be able to attend this [webinar](#) hosted by the USRA booth, on **Monday October 26, from 12:30pm to 1:00pm PDT**. A video of the webinar will be also available for the duration of the meeting.

Casey Honniball (NASA Goddard) will present her team's recent lunar observations, and Bill Reach (SOFIA/USRA) will address the status of the SOFIA project and current opportunities.

### **Tuesday, October 27**

#### **Reddit Q&A: Studying Water on the Moon**

NASA is hosting a [Q&A on Reddit](#) about studying water on the Moon on **Tuesday Oct. 27 10:00-11:30 am PDT**. Participants answering questions include:

- Barbara Cohen, principal investigator of Lunar Flashlight at Goddard Space Flight Center
- Anthony Colaprete, project scientist for the VIPER rover mission at NASA's Ames Research Center
- Casey Honniball, postdoctoral researcher at NASA's Goddard Space Flight Center
- Debra Needham, program scientist for the Exploration Science Strategy and

- Exploration Office at NASA Headquarters
- Noah Petro, project scientist for the Lunar Reconnaissance Orbiter at NASA's Goddard Space Flight Center
- Naseem Rangwala, project scientist for SOFIA mission at NASA's Ames Research Center
- Kelsey Young, NASA Exploration Scientist at NASA Headquarters

## Monday, December 14

### AGU session: SOFIA, An Asset for Planetary Science

Attendees of the [AGU Fall meeting](#) will be able to access the poster session: '[SOFIA, An Asset for Planetary Science](#)' on **Monday Dec 14th**. With contributions from Z. Landsman (UCF), E. Young (SWRI), I. de Pater (UC Berkeley), C. Honniball (NASA Goddard). A Q&A session will also be held (time TBD).

## Tuesday January 12

### AAS Special Session: 'Assessing the Impact of Stellar Feedback'

The SOFIA Science Center is organizing the special session 'Assessing the Impact of Stellar Feedback' at the [237th AAS meeting](#). This session will include recent theoretical and observational results which contribute to the understanding of the role of stellar feedback across different scales, from protostellar clouds to galaxies. Observations of the kinematics and temperature gradients in stellar environments (such as the [FEEDBACK](#) SOFIA legacy program) will be presented. [Get more information.](#)

The oral session will be held on **Tuesday, January 12, from 1:10 pm to 2:40 pm PST** with invited talks by Alexander Tielens (U. Leiden), Laura Lopez (OSU), Mélanie Chevance (U. Heidelberg), Hector Arce (Yale), Susanna Widicus Weaver (U. Wisconsin-Madison) and Crystal Martin (UCSB).



### Join Science Talks Remotely: Colloquia & Tele-Talks

The SOFIA fall colloquium series is held via WebEx on Wednesdays at 3:30 pm Pacific. [See the complete schedule and connection information.](#)

#### Upcoming Colloquia

- October 28: Che-Yu Chen (UVa)
- November 4: Jeyhan Kartalpepe (RIT)
- November 18: Chris Theissen (UCSD)
- December 2: Ellen Howell (LPL)

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. For information on how to participate, check [SOFIA Tele-Talk webpage.](#)

#### Upcoming Tele-Talks

- November 4: PDR structure and kinematics around S235 A and S235 C; Maria Kirsanova (Institute of Astronomy, Russian Academy of Sciences)
- November 18: Polarization Spectrum in OMC-1; Joe Michail (Northwestern University)
- December 2: Radiative Torque Alignment and Interstellar Grain Polarization; Le Ngoc Tram (SOFIA Science Center)
- December 9: Accretion around Massive Young Stellar Objects; Andrew Barr (Leiden)
- January 20: Magnetized Filamentary Gas Flows; Thushara Pillai (Boston University)

Please direct questions and comments to the SOFIA Science Center help desk:  
[sofia\\_help@sofia.usra.edu](mailto:sofia_help@sofia.usra.edu).

