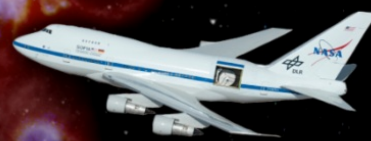


SOFIA

Science Newsletter



July 2020

In this issue:

- The Complex Nature of a 'Simple' Star Formation Tracer
- Building the SOFIA Instrument Roadmap Workshop II
- Cycle 9 Call for Proposals Update
- Upcoming Proposal Webinars
- Science Tele-Talks

Science Spotlight: The Complex Nature of a 'Simple' Star Formation Tracer

The far-infrared fine structure line from singly ionized carbon (C^+) at $158 \mu\text{m}$ (hereafter $[^{12}\text{CII}]$) is one of the important tracers of star-forming activity in near and far galaxies. The only observational way to estimate the optical depth of the $[^{12}\text{CII}]$ line is to compare it with the hyperfine emission from its isotope – $^{13}\text{C}^+$.

[Okada et al. \(2019\)](#) observed $^{13}\text{C}^+$ for the first time in the Large Magellanic Cloud, one of the best-studied star formation laboratories outside our Galaxy, using GREAT onboard SOFIA. Results indicate that the intensity of the $[^{12}\text{CII}]$ emission is lower by a factor of about two compared to that expected from the $[^{13}\text{CII}]$ emission, and the most likely explanation for this disagreement is that the $[^{12}\text{CII}]$ emission is optically thick. Optically thick $[^{12}\text{CII}]$ emission is not limited to small-scale, extreme regions but turns out to be significant over an area of 4-by-4 sq pc in the Large Magellanic Cloud. This is consistent with the large-scale map obtained by GREAT for the Orion Nebula. These results provide a warning to astronomers that the optical depth effect should not be ignored when using $[^{12}\text{CII}]$ as a star-formation tracer. [Read more here.](#)



Spectrum (histogram) of $[^{13}\text{CII}]$ emission in the star-forming region N159W superposed on an image from Hubble Space Telescope of the Large Magellanic Cloud. The blue curve is the scaled emission that would be expected if the $[^{12}\text{CII}]$ emission from the same region were optically thin. The observed intensity of $[^{13}\text{CII}]$ is stronger than the scaled emission, indicating that $[^{12}\text{CII}]$ is optically thick.

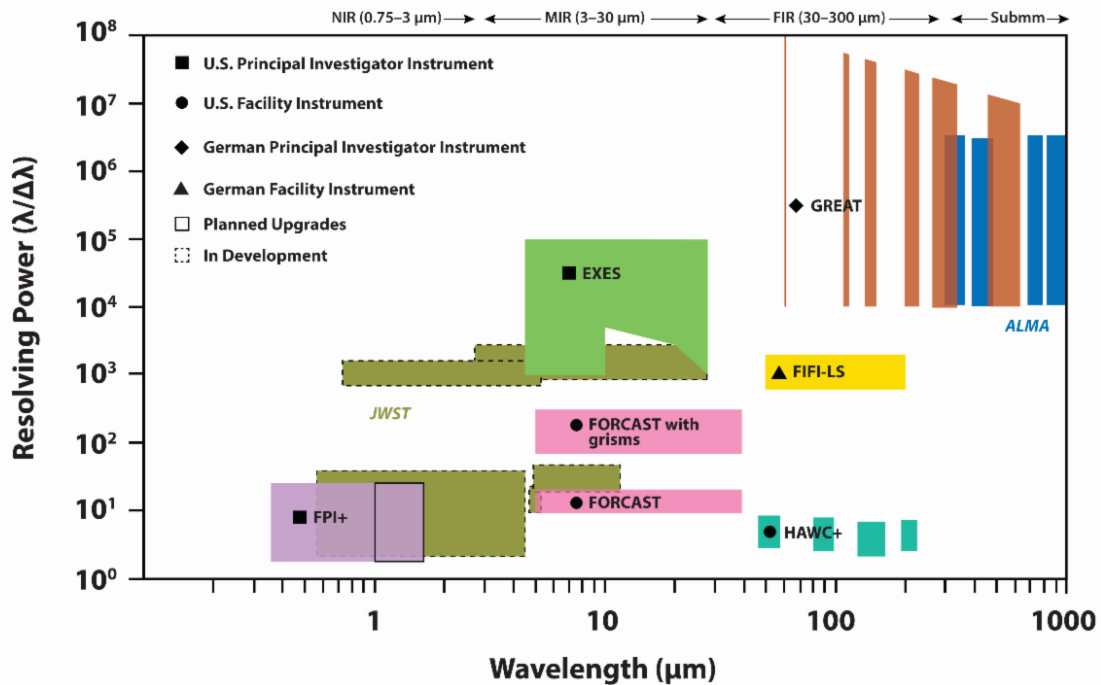
July 27-29: Building the SOFIA Instrument Roadmap Workshop II

This will be the second workshop this summer to solicit and collect community input to help create a plan and timeline, or a “roadmap,” for SOFIA’s instrument development. [The first Roadmap workshop](#), focused on science cases, was held on June 22-24, and was a successful event with more than 200 attendees, vibrant discussions and engaging talks by more than 20 invited speakers. Proceedings are available [here](#).

[The second Roadmap workshop](#) will be held **July 27-29, from 7am to 12pm Pacific Time**, and focus on concepts and feasibilities for technology, instrument upgrades, and new instruments. The agenda can be found [here](#). [Registration is still open](#).

Invited speakers include Darren Dowell (JPL), Paul Goldsmith (JPL), Thomas Goyette (UMass-Lowell), Urs Graf (Cologne), Matt Greenhouse (NASA GSFC), Steve Hailey-Dunsheath (Caltech), Bernd Klein (MPIfR), Pat Knezek (NASA HQ), Alexander Kuttyrev (UMD), Samuel Lara-Avila (Chalmers University of Technology), Leslie Looney (U Illinois), Chris Packham (UTSA), Mike Person (MIT), Judy Pipher (U Rochester), Matt Richter (UC Davis), Erin Smith (NASA GSFC), Johannes Staguhn (JHU), Chris Walker (U Arizona), Erick Young (USRA).

The SOFIA Instruments



Cycle 9 Call for Proposals Update

Since the original release of the Cycle 9 Call for Proposals, we experienced several schedule changes that require the call to be modified. The Cycle 9 Call for Proposals modifications include:

- Modifications to the Southern Hemisphere deployment
- Changes to overall observing time available
- Implementation of the Dual Anonymous Review framework
- Revisions to the SOFIA Instrument Time Estimator

Full details are [available on the Science Center website](#). Also note that a new USPOT version (4.3.3), with updated EXES overheads, is available for download. Please be sure to always use the latest release of USPOT to submit your proposal.

Upcoming Webinars for Cycle 9 Proposals

Introducing Dual-Anonymous Review for SOFIA proposals: Monday August 3, 2020, 8:00-9:00 am PT

In Cycle 9, SOFIA proposal review will be carried out for the first time under the Dual Anonymous Review (DAR) framework. This webinar will present DAR motivations and guidelines to prepare compliant proposal submissions. With presentations from Lou Strolger (STSCI) and B-G Andersson (SOFIA/USRA). Connect through [this Webex link](#). Additional information about the Dual Anonymous Review procedures [are available online](#).

Proposal preparation Webinar: Tuesday August 18, 2020, 8:00-10:00 am PT

This interactive event held on Webex is designed for all astronomers, including new and prospective SOFIA users. The objective is to help proposers in avoiding the typical pitfalls in observing time estimates, and to improve the Technical Feasibility section of their proposals. Detailed examples on each instrument will be shown, demonstrating how to estimate the desired SNR for typical science cases, use the SOFIA Integration Time Estimator (SITE), decide on an observing strategy, and create astronomical observing

requests (AORs) in USPOT. More information to come soon [here](#).

Join Science Talks Remotely: Tele-Talks

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

- August 5: Optical Depth in [CII]; Cristian Guevara (University of Cologne)
- August 19: Mass Motions in Orion A; Cornelia Pabst (Leiden)
- September 9: [CII] in LMC; Vianney Leboutellier (University of Paris-Saclay)
- September 16: CO-dark Molecular Gas Mass in 30 Dor; Mélanie Chevance (University of Heidelberg)
- October 7: First Detection of 13CH; Arshia Jacob (Max Plank Institute for Radioastronomy)

e-Newsletter Editors: Kassandra Bell and Arielle Moullet

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

