SOFIA SUG Winter Meeting

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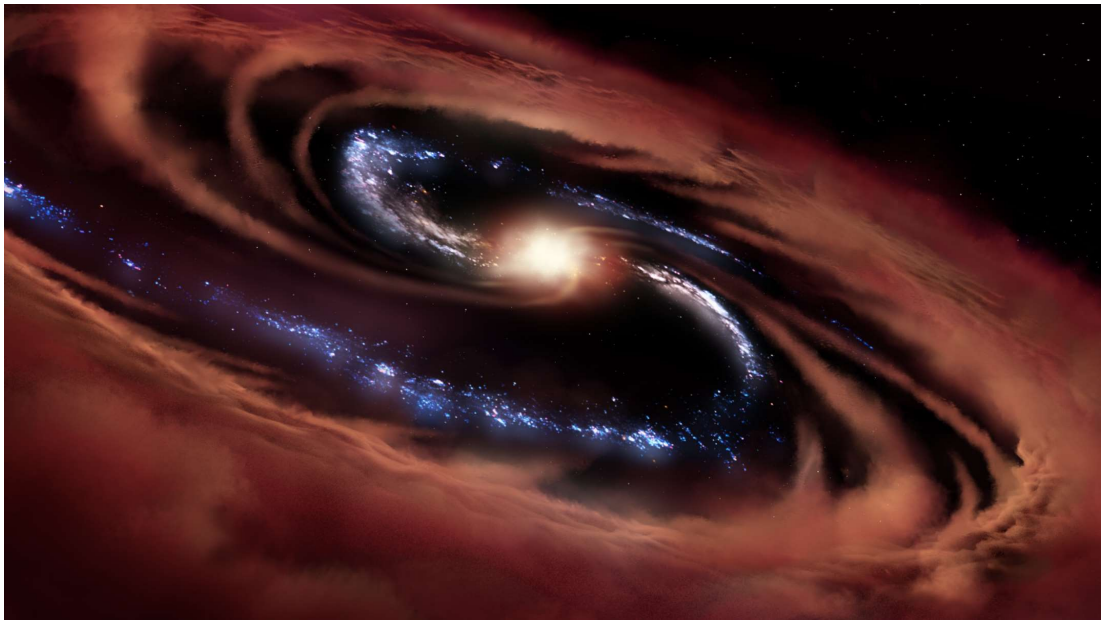
January 26, 2021

SOFIA Stratospheric Observatory for Infrared Astronomy

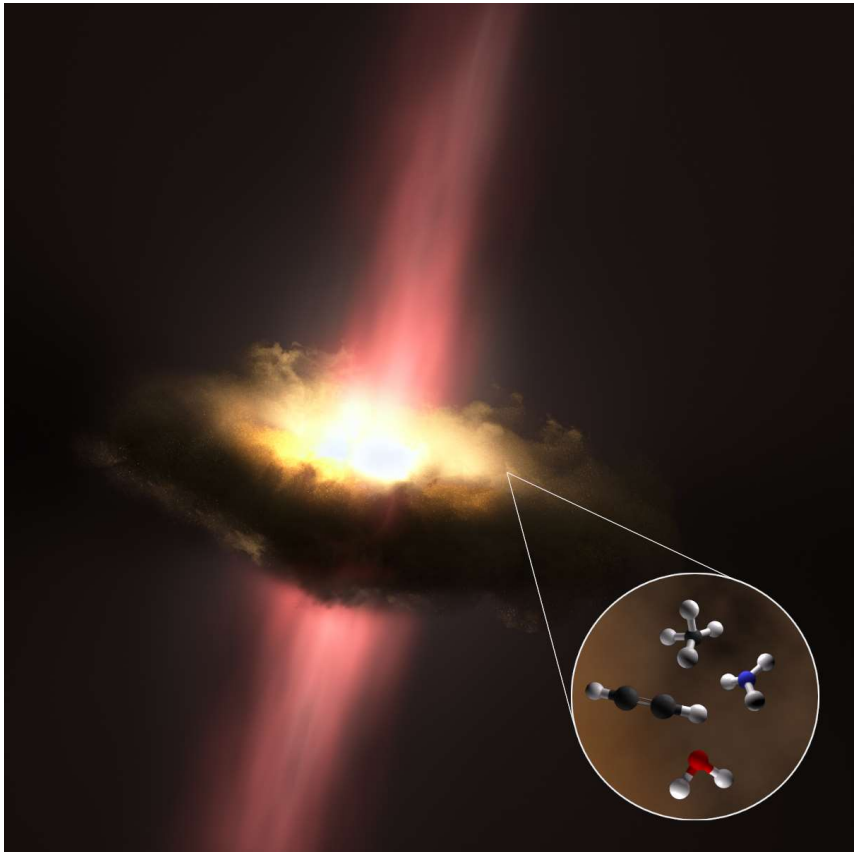
NASA DLR USRA DSI

Science Highlight: Cold Quasar



- A galaxy's stellar population and black hole are growing at the same rate
- This is surprising since theory predicts black hole growth halts stellar growth

Science Highlight: Molecular Processing in the Disks of Massive Stars

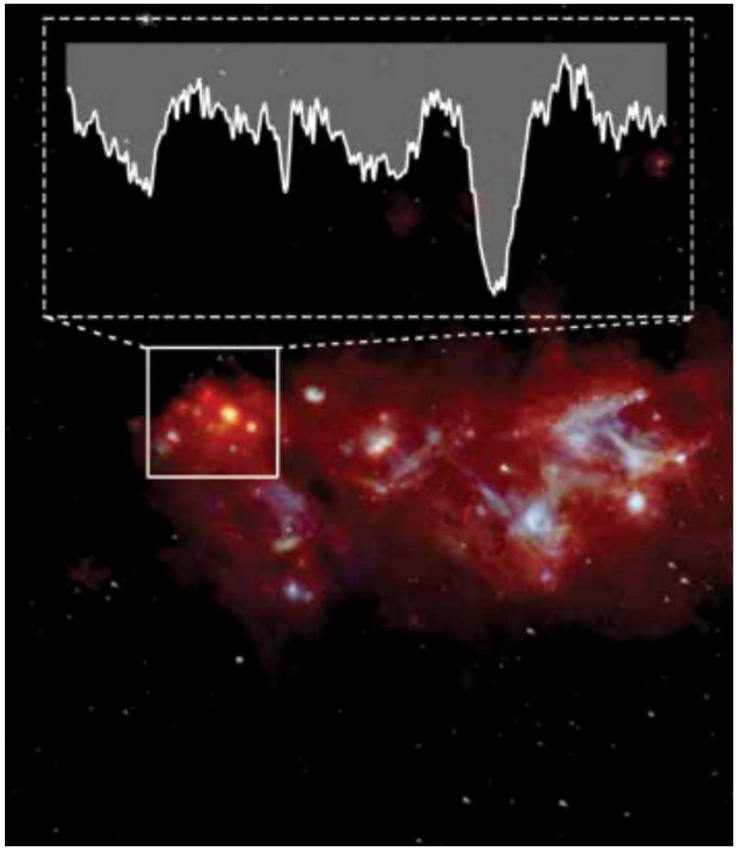


- High resolution, mid-infrared spectroscopy provides new insights into the disks around high-mass stars AFGL 2591 and AFGL 2136
- Absorption lines reveal building blocks for complex organic molecules: CO, H_2O, HCN, C_2H_2, NH_3 and CS

Science Highlight: First Detection of ^{13}CH in the Interstellar Medium

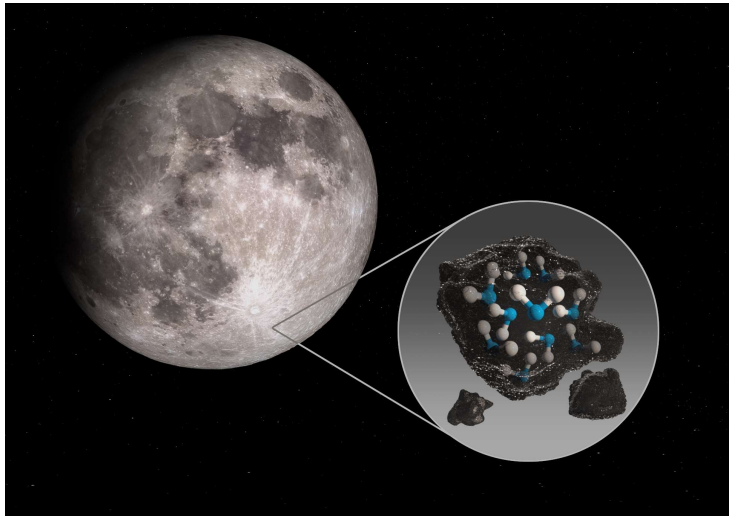
- Rotational transition of ^{13}CH near 2 THz towards four high-mass star-forming regions, SgrB2(M), G34.26+0.15, W51e, and W49(N)

- Provides new robust method to measure $^{13}C/^{12}C$ ratio in the galaxy and understand chemical evolution in the Milky Way



Best Thesis: Dr. Casey Honniball

"Infrared Remote Sensing of Volatile Components on the Earth and Moon," Honniball, 2019, University of Hawai'i at Mānoa



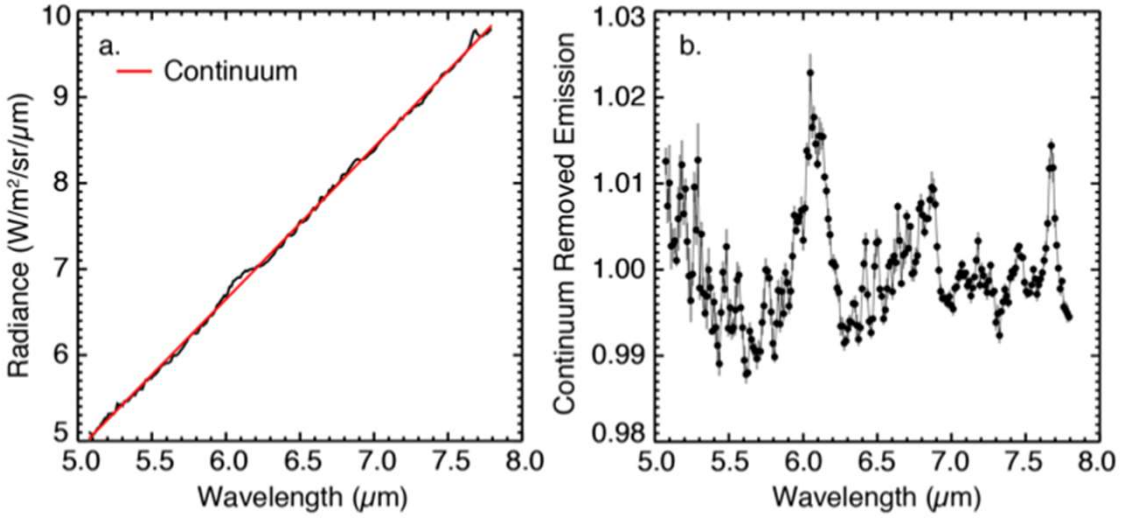
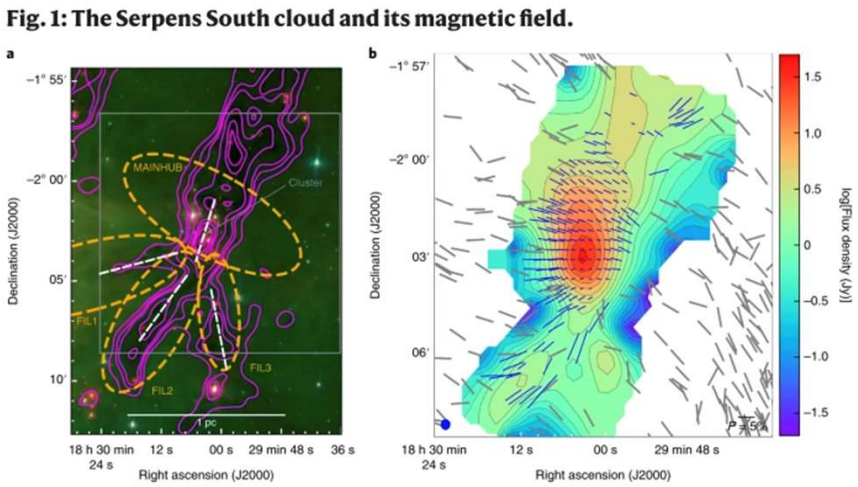


Figure 4.11: a.) Oscillation removed radiance spectrum of Clavius region. b.) Continuum removed radiance showing a strong 6 μm emission band indicating the presence of H_2O.

Best Paper: Dr. Thushara Pillai

"Magnetized filamentary gas flows feeding the young embedded cluster in Serpens South" Pillai, et al., 2020, Nature Astronomy



Response to Flagship Mission Review

- Transformed operations to maximize science return and scientific impact
- Pursuing large, coordinated Legacy Programs
- Increasing the number of overall observing hours
- Increasing the number of observing flights in the Southern Hemisphere
- Enhancing synergies with other observatories and NASA missions

Science Metrics Goals by 2022: Table from FMR response

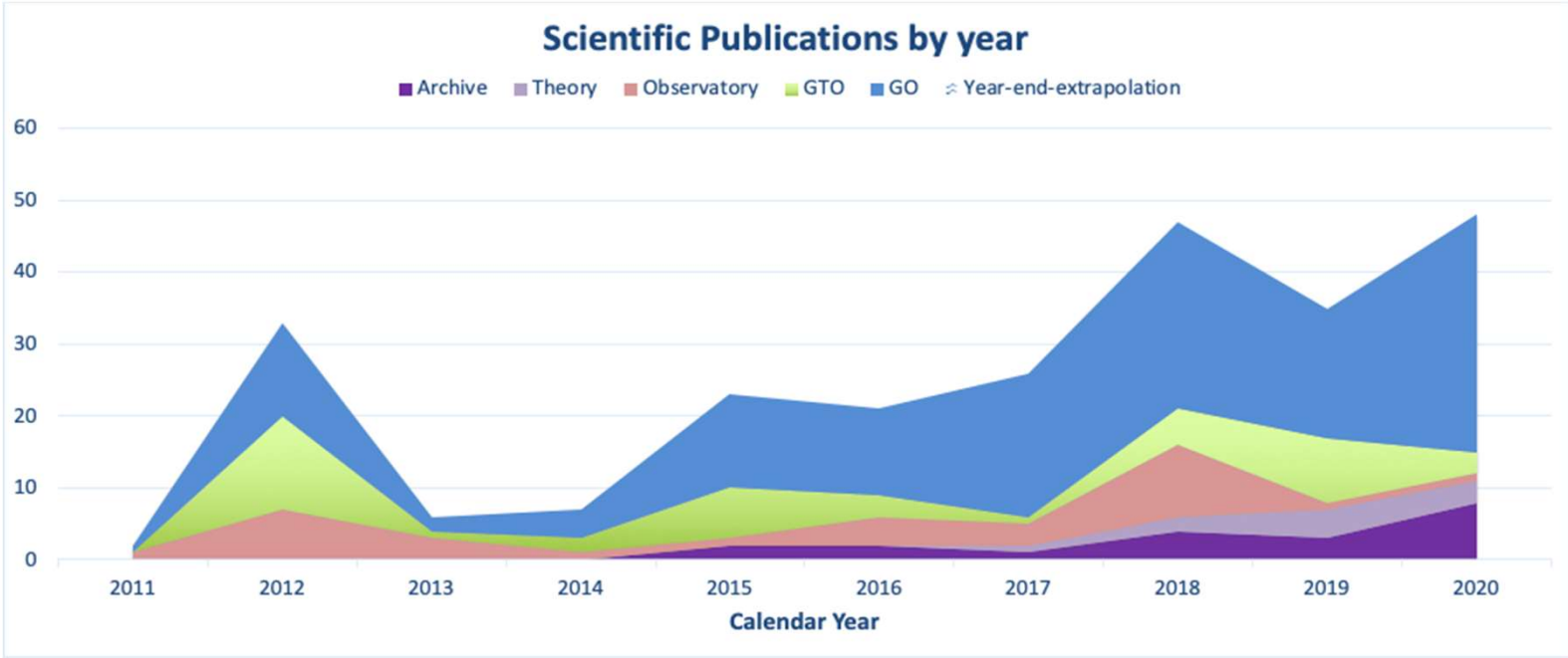
Table 1.4 – SOFIA Key Metrics and Goals

Science Metric	Goal
Publications per year:	> 75 (100)*
Scientific Impact Citation H-Index[2]:	> 30 (44)*
Oversubscription Rate[3]:	≥ 5
Data Processing and Archiving Time:	15 workdays
Completion Rate for High-Priority Programs[4]:	≥ 80%
Fraction of Completed High-Priority Programs Resulting in Publications[5]:	≥ 80%
High-Quality Observing Time: % research hours[6] at precipitable water vapor < 15 µm % on-sky efficiency[7] at precipitable water vapor < 15 µm	 ≥ 90% ≥ 90%

** stretch goals are in parentheses*

Current	FMR	FY21	FY22
43 (FY20), >49 (2020)	150	66	76
23	44		Expect
4.5 time Cy9			COVID impact
15 days for all but abnormal. Goal is for 70% of data			
68% Cycle 7	COVID impacted		
32% Cy5; 52% Cy4; 71% Cy2			
On target			

Science Metrics: Publications by Calendar Year



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	sum
Archive	0	0	0	0	2	2	1	4	3	8		20
Theory	0	0		0	0	0	1	2	4	3		10
GO	1	13	2	4	13	12	20	26	18	33		142
GTO	0	13	1	2	7	3	1	5	9	3		44
Observatory	1	7	3	1	1	4	3	10	1	1		32
Year-end-extrapolation											0.0	
sum	2	33	6	7	23	21	26	47	35	48		248

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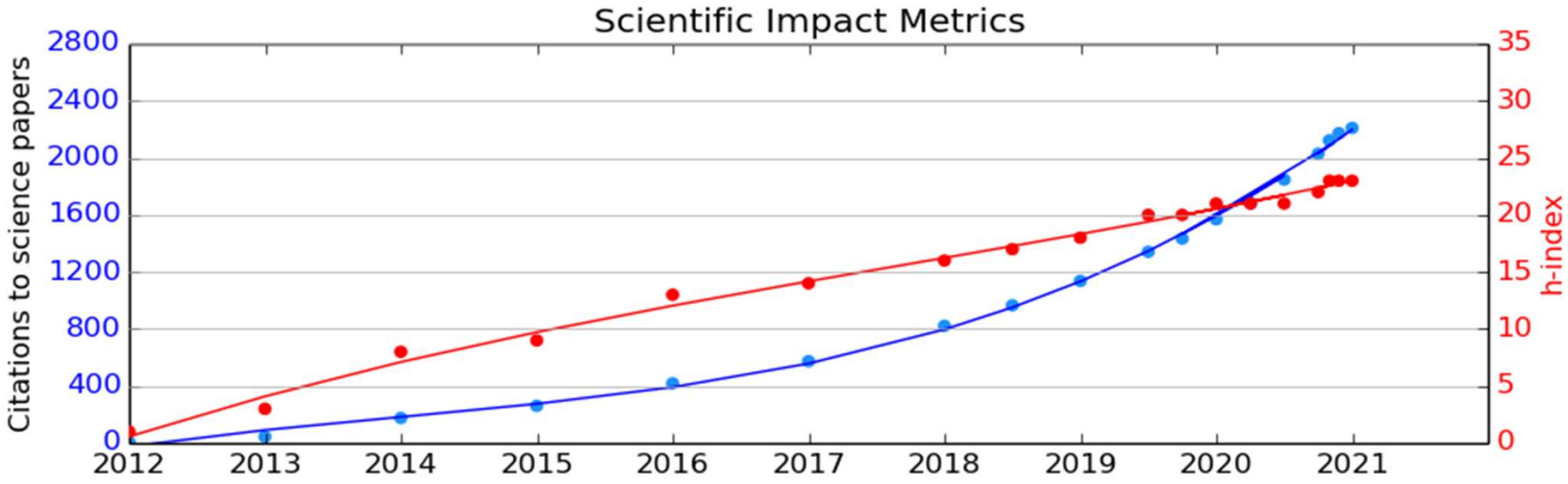
Science Metrics: Impact



	1/1/12	1/1/13	1/1/14	1/1/15	1/1/16	1/1/17	1/1/18	1/1/19	1/1/20	6/30/20	12/30/20
Citations	8	45	176	261	419	574	822	1137	1569	1812	2210
h-index	1	3	8	9	13	14	16	18	21	21	23

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Help Us Recruit the SOFIA Team

Open Positions:

- Postdoctoral Researchers
- Observatory Scientist, Manager
- Associate Director for Project Management and Integration
- Ground Support Engineer
- Manager and Senior Engineer, Maintenance and Engineering