Dr. Steven R. Goldman

Observatory Scientist, Stratospheric Observatory for Infrared Astronomy (SOFIA)
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PROFESSIONAL PREPARATION

SOFIA/USRA, USA November 2021 - present
Scientist

Space Telescope Science Institute, USA October 2017 - November 2021
Postdoctoral fellow

Keele University, UK October 2013 - December 2017
PhD in Astrophysics

St. Lawrence University, USA September 2009 - July 2013
B. S. in Physics

RESEARCH ACHIEVEMENTS

(ADS Library)

Research Interests: The effects of metallicity on the dust production, wind dynamics, mass-loss mechanism, and evolution of Asymptotic Giant Branch stars and Red Supergiants.

- **6 First-Authored Peer-Reviewed Publications**:
  - **Goldman S. R.** et al., 2022, ApJS, 259, 41
    A Census of Thermally-Pulsing AGB stars in the Andromeda Galaxy and a First Estimate of their Contribution to the Global Dust Budget
    * An exhaustive study of the AGB population in M31 and its impact on the galaxy.
    * Presents the most-complete sample of AGB stars (and their photometry) in a metal-rich galaxy, complementing the metal-poor samples in the Magellanic Cloud galaxies.
  - **Goldman S. R.**, 2020, JOSS, 5(54), 2554 citations: 3
    The Dusty Evolved Star Kit (DESK): A Python package for fitting the Spectral Energy Distribution of Evolved Stars. Journal of Open Source Software
    * First open-source package of its kind; includes all commonly used models and options.
    * Standardizes a common but complex and nuanced practice within evolved star science.
    * Makes SED-fitting available for reproducibility, and accessible to newcomers.
  - **Goldman S. R.** et al., 2019, ApJ, 884, 152 citations: 4
    AGB Stars in the Nearby Galaxy: Leo P
    * Discovered the most metal-poor dusty AGB stars currently known.
    * Provides the most compelling evidence that AGB stars produce dust at high redshift.
  - **Goldman S. R.** et al., 2019, ApJ, 877, 49 citations: 21
    An Infrared Census Of Dust In Nearby Galaxies With Spitzer (DUSTiNGS): V. The Period-luminosity Relation For Dusty Metal-poor AGB Stars

    - The first study of the Mira period-luminosity (PL) relation in the mid-infrared (IR).
    - Provides evidence of dust production in galaxies with primitive metal abundances, similar to those of ancient galaxies.
    - Shows that the Mira PL relation is seemingly unaffected by metallicity in the IR, supporting its use as a new avenue for determining distances.

  - **Goldman S. R.** et al., 2018, MNRAS, 473, 3835 citations: 16
    A dearth of OH/IR stars in the Small Magellanic Cloud
    - Discovered a not-yet-understood lack of maser emission in the SMC.
    - Provides critical constraints on metal-poor circumstellar environments using maser non-detections.

  - **Goldman S. R.** et al., 2017, MNRAS, 465, 403 citations: 104
    The wind speeds, dust content, and mass-loss rates of evolved AGB and RSG stars at varying metallicity
    - Provides the most compelling evidence that AGB wind speed is affected by metallicity.
    - Through new maser discoveries, increased the number of reliably-measured evolved star wind speeds outside of the galaxies from 5 to 13.
    - Developed relations and prescriptions for wind speed and mass loss rates.

- **11 Co-Authored Peer-Reviewed Publications**: small international collaborations involving 25+ countries. Focused on probing evolved stellar populations spanning the UV to the radio, on short-term variability and across cosmic time.

  Links: ADS, ORCID, Google Scholar

AWARDED PROPOSALS (PRINCIPAL INVESTIGATOR)

2022 *Hubble Space Telescope*, PID: 17088 ($TBD)	30 primary orbits
2022 GASKAP-OH (Science team lead: LMC maser populations)	50 hours
2021 *Hubble Space Telescope*, PID: 16492 ($65 k)	4 primary orbits
2021 SOFIA, PID: 75_0057 ($40 k)	4 hours
2017 Very Large Telescope VISIR, PID: 099.D-0907	1 night
2017 Very Large Telescope VISIR, PID: 098.D-0272	0.5 hours
2017 Australia Telescope Compact Array Telescope, PID: C2996	92 hours
2016 Very Large Telescope XSHOOTER, PID: 097.D-0605	1.5 hours
2015 Westerbork Synthesis Radio Telescope, PID: R14/010	30 hours
2014 Southern African Large Telescope	5.5 hours

RECENT AWARDED PROPOSALS (CO-INVESTIGATOR)

James Webb Space Telescope (2 programs)	60 primary / 2 parallel orbits
Hubble Space Telescope (7 programs)	102 primary / 520 parallel orbits
SOFIA (2 programs)	20.25 hours
SOFIA Legacy	100+ hours
ACA (NESS)	750 hours
Astrophysics Data Analysis Program (18-ADAP18-142)	$335 k
ALMA	5 hours

SCIENCE COMMUNICATION

2022 Invited Colloquim	University of Auckland, New Zealand
2022 Invited Colloquim	Auckland University of Technology, New Zealand
2022 Invited Colloquim	University of Canterbury, New Zealand
2022 Invited Talk, AAS Summer Meeting	Pasadena, USA
2022 Invited Colloquim	NRC Herzberg, Canada
2022 Poster, SOFIA Lake Arrowhead Conference,	CA, USA
2021 Invited Panelist, Evolved Stars and their Circumstellar Environments	Global (Remote)
2021 Invited Talk, GAPS: unsolved problems in red Giants And suPergiantS	Global (Remote)
2021 Talk, DELVE: The Death-Throes of Evoled Stars	Global (Remote)
2021 Invited Talk	St. Lawrence University, USA
2020 Invited Talk	STScI, USA
2020 Poster, AAS Winter Meeting	Honolulu, USA
2019 Invited Colloquim	RIT, USA
2019 Invited Colloquim	EAO Hawaii, USA
2019 Talk, A Star Has Evolved: A Conference in the Honor of Hans Olofsson	Smögen, Sweden
2019 Talk, HotSci	STScI, USA
2019 Poster, AAS Winter Meeting	Seattle, USA
2018 Poster, IAU General Assembly	Vienna, Austria
2018 Talk, Cosmic Dust: origin, applications & implications	Copenhagen, Denmark
2018 Talk, European Week in Astronomy and Space Science	Liverpool, UK
2016 Talk, Blowing in the wind (Awarded Best Talk)	ICISE, Vietnam
2016 Talk, Postgraduate Research Symposium (Awarded Best Talk)	Keele University, UK
2016 Talk, SKA Delivering the Science	Cambridge University, UK
2015 Talk, UK SKA Science Meeting	Manchester University, UK
2015 Poster, Stellar End Products: The low mass - high mass connection	ESO, Germany
2015 Invited Colloquim,	Kagoshima University, Japan
2014 Poster, Why Galaxies Care About AGB Stars III	University of Vienna, Austria

OBSERVING EXPERIENCE

SOFIA	3 flights
James Clerk Maxwell Telescope	70 hours
Very Large Telescope	1 night
Australia Telescope Compact Array	92 hours
Parkes Radio Telescope	36 hours
Arecibo L-band (ALFALFA)	20 hours

CODE DEVELOPMENT (PYTHON) (Github Profile)

The Dusty-Evolved-Star-Kit (DESK) 2017 - present
Asymptotic Giant Branch Spectral Energy Distribution fitting tool

The Baysian Extinction and Stellar Tool (BEAST) 2017 - present
Fits photometric SEDs of stars to extract stellar and dust extinction parameters

OUTREACH

Virtual Community Outreach, 2018 – Present, (USA, Canada, & Mexico)

- *Skype-a-Scientist*
- NASA's Universe of Learning
- Independently organized

Earth and Space Observatory volunteer, 2013 – 2017, (Keele University, UK)

AWARDED FELLOWSHIPS

2015 E. A. Milne Traveling fellowship (£2500)
2012 National Science Foundation Summer REU fellowship

ACADEMIC SERVICE

SOFIA School Co-Chair	February 2022
STScI postdoctoral representative	2020 - 2022
Bystander Intervention Workshop	March 2021
DELVE conference SOC	February 2021
Low-Density Universe Lunch Organizer	2018-2019
TAC Panel Support: Hubble & SOFIA	
Referee: Astrophysical Journal; Astronomy & Astrophysics	

PROFESSIONAL AFFILIATIONS

DUSTiNGS: DUST In Nearby Galaxies with Spitzer
NESS: Nearby Evolved Star Survey
BEAST: The Baysian Extinction and Stellar Tool
GASKAP: Galactic Australian SKA Pathfinder Survey
SCYLLA: A multi-headed attack on dust evolution and star formation