

# Dr. Steven R. Goldman

Observatory Scientist, Stratospheric Observatory for Infrared Astronomy (SOFIA)

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## PROFESSIONAL PREPARATION

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**SOFIA/USRA, USA**  
Scientist

November 2021 - present

**Space Telescope Science Institute, USA**  
Postdoctoral fellow

October 2017 - November 2021

**Keele University, UK**  
PhD in Astrophysics

October 2013 - December 2017

**St. Lawrence University, USA**  
B. S. in Physics

September 2009 - July 2013

## 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.

- **5 first-author publications:**

- **Goldman S. R.**, 2020, JOSS, 5(54), 2554

*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: 3

*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: 17

*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: 13  
*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: 82  
*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.
- **2 first-author publication in preparation:**
  - **Goldman S. R.** et al., submitted  
*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.** et al., data analysis underway  
*A Multi-Wavelength Study of the Symbiotic Mira HM Sge with SOFIA and HST*
    - \* Highlights the science potential of combining both HST and SOFIA observations.
    - \* Uses the long baseline of observations to study the most recently explosive nearby symbiotic system.
- **10 co-authored 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.
- **15 international science talks & 5 poster presentations:** including colloquia, conference contributions, and journal clubs. Awarded “Best Talk” awards at both domestic and international conferences.

## AWARDED PROPOSALS (PRINCIPAL INVESTIGATOR)

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2021 <i>Hubble Space Telescope</i> , PID: 16492 (\$65 k)	4 primary orbits
2021 SOFIA, DDT, 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)

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<i>James Webb Space Telescope</i> (2 programs)	60 primary / 2 parallel orbits
<i>Hubble Space Telescope</i> (6 programs)	102 primary / 520 parallel orbits
SOFIA (2 programs)	20.25 hours
ACA (NESS)	750 hours
Astrophysics Data Analysis Program (18-ADAP18-142)	\$335 k
ALMA	5 hours

## OBSERVING EXPERIENCE

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SOFIA	2 nights
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

## OUTREACH

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**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

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

## CODE DEVELOPMENT (PYTHON)

([Github Profile](#))

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The Dusty-Evolved-Star-Kit (DESK)	2017 - present
Asymptotic Giant Branch Spectral Energy Distribution fitting tool	
The Bayesian Extinction and Stellar Tool (BEAST)	2017 - present
Fits photometric SEDs of stars to extract stellar and dust extinction parameters	

## ACADEMIC SERVICE AND TRAINING

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STScI postdoctoral representative	2020 - present
Bystander Intervention Workshop	March 2021
DELVE conference SOC	February 2021
Hubble Space Telescope TAC Panel Support	October 2018
Low-Density Universe Lunch Organizer	2018-2019
Referee: Astrophysical Journal; Astronomy & Astrophysics	