Michael A. Gully-Santiago

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Current Position

Environmental Data Scientist SeekOps, Inc. · Austin, TX · 01/2024–*present*

Quantifying Greenhouse Gas Emissions with Tunable Diode Laser Absorption Spectroscopy

Education

Ph. D., Astronomy University of Texas at Austin· Austin, TX · 8/2008–5/2015

B. A., Astronomy & Physics Boston University · Boston, MA · 9/2003–5/2007

Awards

2019, Second Place, PyTorch Machine Learning / AI Summer Hackathon at Facebook HQ

2017, NASA Postdoctoral Program (NPP) Fellowship, *declined*

2016, Peking University Postdoctoral Defense High Pass

2014, University of Texas at Austin Department of Astronomy, David Benfield Memorial fellowship

2010-2013, NASA Graduate Student Research Program Fellowship, JPL Microdevices Lab

2010 & 2011, University of Texas at Austin Dean's Prestigious Fellowship Supplement

2007 Boston University College Prize for Excellence in Astronomy

Funding proposals as PI or Science PI

NASA TCAN Theoretical Computational Astrophysics Networks
"Accelerating Substellar Atmosphere Spectral Inference with Machine Learning Technologies"
$1.5M; *Selected for funding, Sept. 2023*; NNH22ZDA001N-TCAN
Principal Investigator: Gully-Santiago
Collaboration with AMNH (Institue PI: Jackie Faherty) & NASA Ames (Institute PI: Natasha Batalha)

NASA ADAP Astrophysical Data Analysis Program
"Brown Dwarfs in High Definition: Confronting Substellar Atmosphere Models with the Keck-NIRSPEC Archive"
$380k; 2021 - 2024; NNH20ZDA001N-ADAP;
Administrative PI: Caroline Morley

NASA TESS GI Cycle 4
"A Systematic approach to quantifying starspot contrast with TESS and K2"
$69k; 2022 - 2023; NNH20ZDA001N-TESS;
Administrative PI: Caroline Morley

Research Experience and Technical Skills

Research Associate UT Austin Deptartment of Astronomy · Austin, TX · 09/2022–01/2025

Research Fellow · 02/2020–09/2022

Member of Exoplanet Atmospheres Research Group led by Prof. Caroline Morley

Support Scientist Kepler/K2 Guest Observer Office · Moffett Field, CA · 05/2017–01/2020

Research Scientist `baeri.org` at NASA Ames Research Center · Moffett Field, CA · 02/2017–05/2017

Forward modeling Keck and IRTF spectra: Analysis of low resolution near-IR spectroscopy of young stars and brown dwarfs with collaborators T. Greene and M. Marley

Postdoctoral Researcher Kavli Institute for Astronomy and Astrophysics · Beijing, China · 10/2015–10/2016

Forward modeling IGRINS spectra: Analysis of high resolution, high bandwidth near-IR spectroscopy of young stars with collaborator G. Herczeg

Si diffractive optics group, Dept. of Astronomy University of Texas at Austin · Austin, TX · 9/2008–6/2014

Microelectronics Research Center · Austin, TX · 9/2008–6/2013
Center for Nano and Molecular Science · Austin, TX · 9/2008–9/2013

E-beam group, Microdevices Laboratory NASA Jet Propulsion Lab · Pasadena, CA · 9/2010–9/2013

Guest Observer, Magellan Telescope Las Campanas Observatory · La Serena, Chile · 2010–2012

Talks and Conference Participation

Select presentations have `YouTube` videos (▶) or `SpeakDeck` slides (SD) available.

- Talk, SD Large Leading Tail of Helium in a Hot Saturn Undergoing Runaway Inflation, Towards Other Earths, 7/2023
- Talk, SD Interpretable Transfer Learning for Cool Star Spectroscopy, Machine Learning Cool Stars 21, 7/2022
- Talk, Technologies for Precision Stellar Activity, Penn State CEHW Seminar, 4/2022
- Talk, Growing an ecosystem of spectral investigative tools, UT Austin, 9/2021
- Talk, ▶ Condensate cloud modulation in IGRINS and TESS, TESS Science Conference, 8/2021
- Talk, ▶ Applying Probabilistic Inference to Astronomical Spectroscopy, SciPy Conferece, 7/2020
- Talk, SD Frontiers in forward modeling substellar atmospheres, UT Austin, 10/2020
- Talk, SD Know Thy Planet Know Thy Starspots, Exoplanet Spectroscopy e-Workshop, 10/2019
- Talk, Precision Stellar Activity, U. Arizona, Tucson, AZ, 1/2019
- Talk, SD Kepler/K2 and IGRINS constrain starspots, AAS233, Seattle, WA, 1/2019
- Talk, Precision Stellar Activity, UT Austin, Austin, TX, 11/2018
- Talk, SD Measuring starspot physical properties, PLATO-ESP, Marseille, France, 10/2018
- Poster, Physical properties of starspots, Cool Stars 20, Boston, MA, 7/2018
- Talk, SD GPUs for Astronomy Data, NVIDIA Endeavor Research Center, Santa Clara, CA, 4/2018,
- Poster, Physical properties of starspots, NASA Ames Space Science Jamboree, Moffett Field, CA, 4/2018
- Talk, Starspots Confound Planet Transit Spectra, Bay Area Exoplanet Meeting, Moffett Field, CA, 3/2018
- Lightning Talk, Starspots, UC Berkeley Astronomy Lunch Talk, Berkeley, CA, 2/2018,
- Talk, Starspots with K2 and IGRINS, K2 Dwarf Stars and Clusters Workshop, Boston, MA, 1/2018
- Poster, Physical properties of starspots, Know Thy Star Know Thy Planet, Pasadena, CA, 10/2017
- Tutorial, The Starfish Spectral Inference Framework, Other Worlds Laboratory, UCSC, CA, 7/2017
- Talk, Physical properties of starspots, Kepler/K2 Science Conference IV, Moffett Field, CA, 6/2017
- Talk, Fundamental properties of youngs stars, KIPAC, Stanford University, CA, 3/2017
- Talk, Abolute stellar ages and planet formation timescales, Bay Area Exoplanets, NASA Ames, CA, 3/2017

Talk, SJ Measuring Fundamental Properties of Young Stars, Columbia U., NYC, NY, 11/2016
Talk, Measuring Fundamental Properties of Young Stars, Simons CCA, NYC, NY, 11/2016
Talk, Measuring Fundamental Properties of Young Stars, Boston U., Boston, MA 11/2016
Talk, Measuring Fundamental Properties of Young Stars, KIAA Beijing, China, 9/2016
Talk, Python for astronomy, Beijing Python Meetup, China, 8/2016
Poster, Measurement of starspot properties, Cool Stars 19, Uppsala, Sweden 6/2016
Talk, High Resolution Spectroscopy with IGRINS, Seoul, Korea, 11/2015
Attendee, Astro Data Hack Week, Seattle, WA, 9/2014
Poster, SPIE Astronomical Telescopes and Instrumentation, Montreal, QC, 6/2014
Poster, PPVI, Heidelberg, Germany, 7/2013
Talk, Star Formation Lunch, Jet Propulsion Lab, Pasadena, CA, 6/2013
Poster, Award winner- 3^{rd}/45, Nano Night, Center for Nano- and Molecular Science, Austin, TX, 3/2013
Poster, McDonald Observatory Board of Visitors meeting, Austin, TX, 2/2013
Invited Talk, SPIE Astronomical Telescopes and Instrumentation, Amsterdam, NL, July, 2012
Poster, Cool Stars 17, Barcelona, Spain, June 2012
Attendee, American Astronomical Society meeting, Austin, TX, Jan, 2012
Talk, Very Low Mass Stars and Brown Dwarfs, ESO, Garching, Germany, 10/2011
Attendee, National Society of Black and Hispanic Physicists, Austin, TX, 9/2011
Poster, Cool Stars 16, Seattle, WA, 9/2010
Poster, SPIE Astronomical Telescopes and Instrumentation, San Diego, CA, 6/2010

Teaching, Service, Leadership

Students mentored

Sujay Shankar; Undergrad · UT Austin · 2022-*present*
Ryan Hartung; Undergrad · UT Austin · Summer 2022
Jiayi Cao; Undergrad · UT Austin · 2022
Erica Sawczynec; Grad Student (*consulting role*)· UT Austin · 2022
Emily Lubar; Grad Student (*consulting role*)· UT Austin · 2022
Joel Burke; Undergrad (*consulting role*)· UT Austin · 2021
Diana Gonzalez-Argueta; TAURUS Program Undergrad · UT Austin · Summer 2021
Karina Kimani-Stewart; TAURUS Program Undergrad· UT Austin · Summer 2021
Aishwarya Ganesh; Undergrad · UT Austin · 2020–2022
Jessica Luna; Grad Student (*consulting role*) · UT Austin · 2020–2022
Sheila Sagear; NASA Summer Undergrad Intern · Kepler/K2 Science Center · Summer 2018
Amanda Turbyfill; Undergrad · UT Austin · 2013–2014

Hackathon Organizer UT Austin Astronomy Hackathon· Austin, TX · 2015, 2022

Statistical computing tutorial leader Kavli Institute for Astronomy & Astrophysics · Beijing, China · 2015–2016

Graduate Student Representative University of Texas at Austin Department of Astronomy · 6/2011–6/2012

Faculty member Clay Center Observatory at the Dexter & Southfield Schools · Brookline, MA · 6/2007–6/2008

Adult and continuing education instructor Brookline Adult Education · Brookline, MA · 6/2005–6/2008

Night lab teaching assistant Boston University · Boston, MA · 2006–2007

Public Outreach and Media Appearances

Screencast producer

YouTube `lightkurve` tutorials · 2018–2019

Podcast Appearances

Blue Dot Podcast: "The K2 Mission", NCPR, 6/2018

"Discovery and characterization of brown dwarfs", KVRX, 91.7FM · Austin, TX· 12/2012

Podcast Host, *They Blinded Me with Science* KVRX, 91.7FM · Austin, TX· 5/2013–5/2014

Produced and/or co-hosted 30 original science podcasts, with seed funding from UT College of Natural Sciences

Public talks and appearances

Talk, "How stars and planets form", Astronomy on Tap Bay Area, San Jose, CA, 2/2018

`Nightlife` Public Engagement, Cal Academy of Sciences, San Francisco, CA, 2017 & 2018

Invited talk, McDonald Observatory Board of Visitors meeting, Austin, TX, 2/2012

Science Under the Stars, Brackenridge Field Lab, Austin, TX, 12/2012

Interactive museum-style educational installation Department of Astronomy · Austin, TX· 7/2013–9/2014

X^1 Unique coursework or independent study

Statistical Modeling II, Prof. James Scott Statistics Department· 1/2014–5/2014

Statistics, Data Mining and Machine Learning in Astronomy Independent study· 1/2014–8/2014

Computer Skills

Creator: `muler`, `gollum`, `blasé`, `ynot`

Maintainer: `Starfish`, `lightkurve`, `telfit`

, , **git**, , LaTeX, , , , `bokeh`, `conda`, `IDL`, `PyTorch`, `JAX`

NASA Advanced Supercomputing (NAS) High End Computing Capability (HECC) *Pleiades* 2018–2020

Texas Advanced Computing Center (TACC): *Maverick* 2015, *Frontera* 2020 – present