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Current Position

Research Fellow UT Austin Department of Astronomy · Austin, TX · 02/2020–*present*
Member of Exoplanet Atmospheres Research Group led by Prof. Caroline Morley

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 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 Science PI

NASA ADAP

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

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 () available.

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 Conference, 7/2020
Talk,  Frontiers in forward modeling substellar atmospheres, UT Austin, 10/2020
Talk,  Know Thy Planet Know Thy Starspots, Exoplanet Spectroscopy e-Workshop, 10/2019
Talk, Precision Stellar Activity, U. Arizona, Tucson, AZ, 1/2019
Talk,  Kepler/K2 and IGRINS constrain starspots, AAS233, Seattle, WA, 1/2019
Talk, Precision Stellar Activity, UT Austin, Austin, TX, 11/2018
Talk,  Measuring starspot physical properties, PLATO-ESP, Marseille, France, 10/2018
Poster, Physical properties of starspots, Cool Stars 20, Boston, MA, 7/2018
Talk,  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 young stars, KIPAC, Stanford University, CA, 3/2017
Talk, Absolute stellar ages and planet formation timescales, Bay Area Exoplanets, NASA Ames, CA, 3/2017
Talk,  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

Ryan Hartung; Undergrad · UT Austin · Summer 2022 (anticipated)
 Jiayi Cao; Undergrad · UT Austin · 2022
 Sujay Shankar; 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 Sagar; 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

X¹ 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, , , , bokeh, conda, IDL, PyTorch

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

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

First Author Publications

- [1] **Gully-Santiago, M.** and C. Morley, "An Interpretable Machine Learning Framework for Modeling High-Resolution Spectroscopic Data," *Submitted*, Aug. 2022.
- [2] **Gully-Santiago, M.**, J. Luna, C. Morley, K. Kaplan, A. Ganesh, E. Sawczynec, J. Burke, and D. Krolikowski, "Astronomical échelle spectroscopy data analysis with 'muler'," *The Journal of Open Source Software*, vol. 7, no. 73, p. 4302, May 2022.
- [3] **Gully-Santiago, M. A.**, G. J. Herczeg, I. Czekala, G. Somers, K. Grankin, K. R. Covey, J. F. Donati, S. H. P. Alencar, G. A. J. Hussain, B. J. Shappee, G. N. Mace, J.-J. Lee, T. W.-S. Holoien, J. Jose, and C.-F. Liu, "Placing the Spotted T Tauri Star LkCa 4 on an HR Diagram," *The Astrophysical Journal*, vol. 836, p. 200, Feb. 2017.
- [4] **Gully-Santiago, M.**, D. T. Jaffe, and V. White, "Optical characterization of gaps in directly bonded Si compound optics using infrared spectroscopy," *Applied Optics*, vol. 54, p. 10177, Dec. 2015.
- [5] **Gully-Santiago, M. A.**, D. T. Jaffe, C. B. Brooks, D. W. Wilson, and R. E. Muller, "High performance Si immersion gratings patterned with electron beam lithography," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9151, Jul. 2014, p. 5.
- [6] **Gully-Santiago, M.**, W. Wang, C. Deen, and D. Jaffe, "Near-infrared metrology of high-performance silicon immersion gratings," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 8450, Sep. 2012.
- [7] **Gully-Santiago, M. A.**, K. N. Allers, and D. T. Jaffe, "Confirmation and Characterization of Young Disk-Bearing Brown Dwarfs and sub-Brown Dwarfs," in *16th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun*, ser. Astronomical Society of the Pacific Conference Series, C. Johns-Krull, M. K. Browning, and A. A. West, Eds., vol. 448, Dec. 2011, p. 633.
- [8] **Gully-Santiago, M.**, W. Wang, C. Deen, D. Kelly, T. P. Greene, J. Bacon, and D. T. Jaffe, "High-performance silicon grisms for 1.2–8.0 μm : detailed results from the JWST-NIRCam devices," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 7739, Jul. 2010.

Contributing Author Publications

- [1] J. E. Libby-Roberts, Z. K. Berta-Thompson, H. Diamond-Lowe, M. A. Gully-Santiago, J. M. Irwin, E. M. R. Kempton, B. V. Rackham, D. Charbonneau, J.-M. Désert, J. A. Dittmann, R. Hofmann, C. V. Morley, and E. R. Newton, “The Featureless HST/WFC3 Transmission Spectrum of the Rocky Exoplanet GJ 1132b: No Evidence for a Cloud-free Primordial Atmosphere and Constraints on Starspot Contamination,” *The Astronomical Journal*, vol. 164, no. 2, p. 59, Aug. 2022.
- [2] E. M. Leiner, A. M. Geller, **Gully-Santiago, Michael A.**, N. M. Gosnell, and B. M. Tofflemire, “Revealing the Field Sub-subgiant Population Using a Catalog of Active Giant Stars and Gaia EDR3,” *The Astrophysical Journal*, vol. 927, no. 2, p. 222, Mar. 2022.
- [3] E. K. Palumbo, B. T. Montet, A. D. Feinstein, L. G. Bouma, J. D. Hartman, L. A. Hillenbrand, **Gully-Santiago, Michael A.**, and K. A. Banks, “Evidence for Centrifugal Breakout around the Young M Dwarf TIC 234284556,” *The Astrophysical Journal*, vol. 925, no. 1, p. 75, Jan. 2022.
- [4] N. M. Gosnell, **Gully-Santiago, Michael A.**, E. M. Leiner, and B. M. Tofflemire, “Observationally Constraining the Starspot Properties of Magnetically Active M67 Sub-subgiant S1063,” *The Astrophysical Journal*, vol. 925, no. 1, p. 5, Jan. 2022.
- [5] Q. Wang, A. Rest, Y. Zenati, R. Ridden-Harper, G. Dimitriadis, G. Narayan, V. A. Villar, M. R. Magee, R. J. Foley, E. J. Shaya, P. Garnavich, L. Wang, L. Hu, A. Bódi, P. Armstrong, K. Auchettl, T. Barclay, G. Barentsen, Z. Bognár, J. Brimacombe, J. Bulger, J. Burke, P. Challis, K. Chambers, D. A. Coulter, G. Csörnyei, B. Cseh, M. Deckers, J. L. Dotson, L. Galbany, S. González-Gaitán, M. Gromadzki, **Gully-Santiago, Michael**, O. Hanyecz, C. Hedges, D. Hiramatsu, G. Hosseinzadeh, D. A. Howell, S. B. Howell, M. E. Huber, S. W. Jha, D. O. Jones, R. Könyves-Tóth, C. Kalup, C. D. Kilpatrick, L. Kriskovics, W. Li, T. B. Lowe, S. Margheim, C. McCully, A. Mitra, J. A. Muñoz, M. Nicholl, J. Nordin, A. Pál, Y.-C. Pan, A. L. Piro, S. Rest, J. Rino-Silvestre, C. Rojas-Bravo, K. Sárneczky, M. R. Siebert, S. J. Smartt, K. Smith, Á. Sódor, M. D. Stritzinger, R. Szabó, R. Szakáts, B. E. Tucker, J. Vinkó, X. Wang, J. C. Wheeler, D. R. Young, A. Zenteno, K. Zhang, and G. Zsidi, “SN 2018agk: A Prototypical Type Ia Supernova with a Smooth Power-law Rise in Kepler (K2),” *The Astrophysical Journal*, vol. 923, no. 2, p. 167, Dec. 2021.
- [6] P. Armstrong, B. E. Tucker, A. Rest, R. Ridden-Harper, Y. Zenati, A. L. Piro, S. Hinton, C. Lidman, S. Margheim, G. Narayan, E. Shaya, P. Garnavich, D. Kasen, V. Villar, A. Zenteno, I. Arcavi, M. Drout, R. J. Foley, J. Wheeler, J. Anais, A. Campillay, D. Coulter, G. Dimitriadis, D. Jones, C. D. Kilpatrick, N. Muñoz-Elgueta, C. Rojas-Bravo, J. Vargas-González, J. Bulger, K. Chambers, M. Huber, T. Lowe, E. Magnier, B. J. Shappee, S. Smartt, K. W. Smith, T. Barclay, G. Barentsen, J. Dotson, **Gully-Santiago, M.**, C. Hedges, S. Howell, A. Cody, K. Auchettl, A. Bódi, Z. Bognár, J. Brimacombe, P. Brown, B. Cseh, L. Galbany, D. Hiramatsu, T. W. S. Holoién, D. A. Howell, S. W. Jha, R. Könyves-Tóth, L. Kriskovics, C. McCully, P. Milne, J. Muñoz, Y. Pan, A. Pál, H. Sai, K. Sárneczky, N. Smith, Á. Sódor, R. Szabó, R. Szakáts, S. Valenti, J. Vinkó, X. Wang, K. Zhang, and G. Zsidi, “SN2017jgh: a high-cadence complete shock cooling light curve of a SN IIb with the Kepler telescope,” *Monthly Notices of the Royal Astronomical Society*, vol. 507, no. 3, pp. 3125–3138, Nov. 2021.
- [7] R. López-Valdivia, K. R. Sokal, G. N. Mace, B. T. Kidder, M. Hussaini, L. Nofi, L. Prato, C. M. Johns-Krull, H. Oh, J.-J. Lee, C. Park, J. S. Oh, A. Kraus, K. F. Kaplan, J. Llama, A. W. Mann, H. Kim, **Gully-Santiago, Michael A.**, H.-I. Lee, S. Pak, N. Hwang, and D. T. Jaffe, “The IGRINS YSO Survey. I. Stellar Parameters of Pre-main-sequence Stars in Taurus-Auriga,” *The Astrophysical Journal*, vol. 921, no. 1, p. 53, Nov. 2021.
- [8] A. D. Feinstein, B. T. Montet, M. C. Johnson, J. L. Bean, T. J. David, **Gully-Santiago, Michael A.**, J. H. Livingston, and R. Luger, “H-alpha and Ca II Infrared Triplet Variations During a Transit of the 23 Myr Planet V1298 Tau c,” *The Astronomical Journal*, vol. 162, no. 5, p. 213, Nov. 2021.
- [9] E. Lubar, D. T. Jaffe, C. B. Brooks, S. Hickman, G. Mace, and **Gully-Santiago, Michael**, “Precise blaze angle measurements of lithographically fabricated silicon immersion gratings,” in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 11451, Dec. 2020, p. 114515I.
- [10] A. D. Feinstein, B. T. Montet, M. Ansdell, B. Nord, J. L. Bean, M. N. Günther, **Gully-Santiago, Michael A.**, and J. E. Schlieder, “Flare Statistics for Young Stars from a Convolutional Neural Network Analysis of TESS Data,” *The Astronomical Journal*, vol. 160, no. 5, p. 219, Nov. 2020.
- [11] R. Ridden-Harper, B. E. Tucker, **Gully-Santiago, M.**, G. Barentsen, A. Rest, P. Garnavich, and E. Shaya, “K2: Background Survey - the search for undiscovered transients in Kepler/K2 data,” *Monthly Notices of the Royal Astronomical Society*, vol. 498, no. 1, pp. 33–43, Oct. 2020.
- [12] B. T. Montet, A. D. Feinstein, R. Luger, M. E. Bedell, **Gully-Santiago, Michael A.**, J. K. Teske, S. X. Wang, R. P. Butler, E. Flowers, S. A. Shectman, J. D. Crane, and I. B. Thompson, “The Young Planet DS Tuc Ab Has a Low Obliquity,” *The Astronomical Journal*, vol. 159, no. 3, p. 112, Mar. 2020.

- [13] R. Ridden-Harper, B. E. Tucker, P. Garnavich, A. Rest, S. Margheim, E. J. Shaya, C. Littlefield, G. Barensten, C. Hedges, and **Gully-Santiago, M.**, "Discovery of a new WZ Sagittae-type cataclysmic variable in the Kepler/K2 data," *Monthly Notices of the Royal Astronomical Society*, vol. 490, no. 4, pp. 5551–5559, Dec. 2019.
- [14] F. Long, G. J. Herczeg, D. Harsono, P. Pinilla, M. Tazzari, C. F. Manara, I. Pascucci, S. Cabrit, B. Nisini, D. Johnstone, S. Edwards, C. Salyk, F. Menard, G. Lodato, Y. Boehler, G. N. Mace, Y. Liu, G. D. Mulders, N. Hendler, E. Ragusa, W. J. Fischer, A. Banzatti, E. Rigliaco, G. van de Plas, G. Dipierro, **Gully-Santiago, Michael**, and R. Lopez-Valdivia, "Compact Disks in a High-resolution ALMA Survey of Dust Structures in the Taurus Molecular Cloud," *The Astrophysical Journal*, vol. 882, no. 1, p. 49, Sep. 2019.
- [15] G. Lodato, G. Dipierro, E. Ragusa, F. Long, G. J. Herczeg, I. Pascucci, P. Pinilla, C. F. Manara, M. Tazzari, Y. Liu, G. D. Mulders, D. Harsono, Y. Boehler, F. Ménard, D. Johnstone, C. Salyk, G. van der Plas, S. Cabrit, S. Edwards, W. J. Fischer, N. Hendler, B. Nisini, E. Rigliaco, H. Avenhaus, A. Banzatti, and **Gully-Santiago, Michael**, "The newborn planet population emerging from ring-like structures in discs," *Monthly Notice of the Royal Astronomical Society*, vol. 486, no. 1, pp. 453–461, Jun. 2019.
- [16] Y. Liu, G. Dipierro, E. Ragusa, G. Lodato, G. J. Herczeg, F. Long, D. Harsono, Y. Boehler, F. Menard, D. Johnstone, I. Pascucci, P. Pinilla, C. Salyk, G. van der Plas, S. Cabrit, W. J. Fischer, N. Hendler, C. F. Manara, B. Nisini, E. Rigliaco, H. Avenhaus, A. Banzatti, and **Gully-Santiago, Michael**, "Ring structure in the MWC 480 disk revealed by ALMA," *Astronomy and Astrophysics*, vol. 622, p. A75, Feb. 2019.
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