

MICHAEL A. GULLY-SANTIAGO

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🏠 Current Position

Research Fellow UT Austin Department of Astronomy · Austin, TX · 02/2020–*present*

🎓 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

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

🔧 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 presentation slides available at speakerdeck.com/gully.

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- 3rd/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

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

Students mentored

Summer 2018 · S. Sagar; Kepler/K2 Guest Observer Office · Moffett Field, CA
2017–2018 · Z. Cardoso; Kepler/K2 Guest Observer Office · Moffett Field, CA
2013–2014 · A. Turbyfill; University of Texas at Austin · Austin, TX

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”, NCPD, 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

x² 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

Maintainer: Starfish, lightkurve

Python, Jupyter, \LaTeX , git, \LaTeX , \LaTeX , 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. 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.
- [2] **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.

- [3] **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.
- [4] **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.
- [5] **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.
- [6] **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] G. Dimitriadis, R. J. Foley, A. Rest, D. Kasen, A. L. Piro, A. Polin, D. O. Jones, A. Villar, G. Narayan, D. A. Coulter, C. D. Kilpatrick, Y.-C. Pan, C. Rojas-Bravo, O. D. Fox, S. W. Jha, P. E. Nugent, A. G. Riess, D. Scolnic, M. R. Drout, G. Barentsen, J. Dotson, **Gully-Santiago, M.**, C. Hedges, A. M. Cody, T. Barclay, S. Howell, and *al.*, "K2 Observations of SN 2018oh Reveal a Two-Component Rising Light Curve for a Type Ia Supernova," *arXiv e-prints*, Nov. 2018.
- [2] F. Long, P. Pinilla, G. J. Herczeg, D. Harsono, G. Dipierro, I. Pascucci, N. Hendler, M. Tazzari, E. Ragusa, C. Salyk, S. Edwards, G. Lodato, G. van de Plas, D. Johnstone, Y. Liu, Y. Boehler, S. Cabrit, C. F. Manara, F. Menard, G. D. Mulders, B. Nisini, W. J. Fischer, E. Rigliaco, A. Banzatti, H. Avenhaus, and **Gully-Santiago, M.**, "Gaps and Rings in an ALMA Survey of Disks in the Taurus Star-forming Region," *Astrophysical Journal*, vol. 869, p. 17, Dec. 2018.
- [3] Z. Guo, **Gully-Santiago, M.**, and G. J. Herczeg, "The Effect of Spots on the Luminosity Spread of the Pleiades," *Astrophysical Journal*, vol. 868, p. 143, Dec. 2018.
- [4] T. P. Greene, **Gully-Santiago, M. A.**, and M. Barsony, "Detection of Photospheric Features in the Near-infrared Spectrum of a Class 0 Protostar," *The Astrophysical Journal*, vol. 862, p. 85, Jul. 2018.
- [5] D. Apai, B. V. Rackham, M. S. Giampapa, D. Angerhausen, J. Teske, J. Barstow, L. Carone, H. Cegla, S. D. Domagal-Goldman, N. Espinoza, H. Giles, **Gully-Santiago, M.**, R. Haywood, R. Hu, A. Jordan, L. Kreidberg, M. Line, J. Llama, M. López-Morales, M. S. Marley, and J. de Wit, "Understanding Stellar Contamination in Exoplanet Transmission Spectra as an Essential Step in Small Planet Characterization," *arXiv e-prints*, Mar. 2018.
- [6] C. P. Deen, **Gully-Santiago, M.**, W. Wang, J. Pozderac, D. J. Mar, and D. T. Jaffe, "A Grism Design Review and the As-Built Performance of the Silicon Grisms for JWST-NIRCam," *Publications of the Astronomical Society of the Pacific*, vol. 129, no. 6, p. 065004, Jun. 2017.
- [7] G. J. Herczeg, S. Dong, B. J. Shappee, P. Chen(#38472 #24179, L. A. Hillenbrand, J. Jose, C. S. Kochanek, J. L. Prieto, K. Z. Stanek, K. Kaplan, T. W.-S. Holoien, S. Mairs, D. Johnstone, **Gully-Santiago, M.**, Z. Zhu, M. C. Smith, D. Bersier, G. D. Mulders, A. V. Filippenko, K. Ayani, J. Brimacombe, J. S. Brown, M. Connelley, J. Harmanen, R. Itoh, K. S. Kawabata, H. Maehara, K. Takata, H. Yuk, and W. Zheng, "The Eruption of the Candidate Young Star ASASSN-15QI," *The Astrophysical Journal*, vol. 831, p. 133, Nov. 2016.
- [8] G. Mace, H. Kim, D. T. Jaffe, C. Park, J.-J. Lee, K. Kaplan, Y. S. Yu, I.-S. Yuk, M.-Y. Chun, S. Pak, K.-M. Kim, J.-E. Lee, C. A. Sneden, M. Afsar, M. D. Pavel, H. Lee, H. Oh, U. Jeong, S. Park, B. Kidder, H.-I. Lee, H. A. Nguyen Le, J. McLane, **Gully-Santiago, M.**, J. S. Oh, S. Lee, N. Hwang, and B.-G. Park, "300 nights of science with IGRINS at McDonald Observatory," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Proc. of the SPIE, vol. 9908, Aug. 2016, p. 99080C.
- [9] S. Kendrew, C. Deen, N. Radziwill, S. Crawford, J. Gilbert, **Gully-Santiago, M.**, and P. Kubánek, "The first SPIE software Hack Day," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9152, Jul. 2014, p. 2.
- [10] C. B. Brooks, **Gully-Santiago, M.**, M. Grigas, and D. T. Jaffe, "New metrology techniques improve the production of silicon diffractive optics," 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. 1.

- [11] D. T. Jaffe, S. Barnes, C. Brooks, **Gully-Santiago, M.**, S. Pak, C. Park, and I. Yuk, "GMTNIRS (Giant Magellan Telescope Near-Infrared Spectrograph): optimizing the design for maximum science productivity and minimum risk," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9147, Jul. 2014, p. 22.
- [12] C. Park, D. T. Jaffe, I.-S. Yuk, M.-Y. Chun, S. Pak, K.-M. Kim, M. Pavel, H. Lee, H. Oh, U. Jeong, C. K. Sim, H.-I. Lee, H. A. Nguyen Le, J. Strubhar, **Gully-Santiago, M.**, J. S. Oh, S.-M. Cha, B. Moon, K. Park, C. Brooks, K. Ko, J.-Y. Han, J. Nah, P. C. Hill, S. Lee, S. Barnes, Y. S. Yu, K. Kaplan, G. Mace, H. Kim, J.-J. Lee, N. Hwang, and B.-G. Park, "Design and early performance of IGRINS (Immersion Grating Infrared Spectrometer)," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 9147, Jul. 2014, p. 1.
- [13] V. Joergens, G. Herczeg, Y. Liu, I. Pascucci, E. Whelan, J. Alcalá, K. Biazzo, G. Costigan, **Gully-Santiago, M.**, T. Henning, A. Natta, E. Rigliaco, M. V. Rodríguez-Ledesma, A. Sicilia-Aguilar, J. Tottle, and S. Wolf, "Disks, accretion and outflows of brown dwarfs," *Astronomische Nachrichten*, vol. 334, p. 159, Feb. 2013.
- [14] J.-Y. Han, I.-S. Yuk, K. Ko, H. Oh, J. Nah, J. S. Oh, C. Park, S. Lee, K.-M. Kim, M.-Y. Chun, D. T. Jaffe, S. Pak, and **Gully-Santiago, M.**, "Alignment based on a no adjustment philosophy for the Immersion Grating Infrared Spectrometer (IGRINS)," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 8550, Dec. 2012.
- [15] W. Wang, **Gully-Santiago, M.**, C. Deen, D. J. Mar, and D. T. Jaffe, "Manufacturing of silicon immersion gratings for infrared spectrometers," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 7739, Jul. 2010.
- [16] S. Lee, I.-S. Yuk, H. Lee, W. Wang, C. Park, K.-J. Park, M.-Y. Chun, S. Pak, J. Strubhar, C. Deen, **Gully-Santiago, M.**, J. Rand, H. Seo, J. Kwon, H. Oh, S. Barnes, J. Lacy, J. Goertz, W.-K. Park, T.-S. Pyo, and D. T. Jaffe, "GMTNIRS (Giant Magellan Telescope near-infrared spectrograph): design concept," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 7735, Jul. 2010.
- [17] I.-S. Yuk, D. T. Jaffe, S. Barnes, M.-Y. Chun, C. Park, S. Lee, H. Lee, W. Wang, K.-J. Park, S. Pak, J. Strubhar, C. Deen, H. Oh, H. Seo, T.-S. Pyo, W.-K. Park, J. Lacy, J. Goertz, J. Rand, and **Gully-Santiago, M.**, "Preliminary design of IGRINS (Immersion GRating INfrared Spectrograph)," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 7735, Jul. 2010.
- [18] T. Greene, C. Beichman, **Gully-Santiago, M.**, D. Jaffe, D. Kelly, J. Krist, M. Rieke, and E. H. Smith, "NIRCam: development and testing of the JWST near-infrared camera," in *Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series*, ser. Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 7731, Jul. 2010.