

SEBASTIAN GOMEZ
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Current Position

2021 – STScI Postdoctoral Fellow at Space Telescope Science Institute: Prize fellowship for 50% independent research and 50% functional work for Roman Space Telescope.

Education

2021 Ph.D. Astronomy and Astrophysics - Harvard University

2017 M.A. Astronomy and Astrophysics - Harvard University

2015 B.S. Physics - The University of Texas at El Paso (UTEP)
Summa Cum Laude

2011 Tecnológico de Monterrey, Ciudad Juárez, México
With Honors

Research Experience in Time-Domain Astronomy

Harvard University (2015 - 2021) Working on observations of **Exotic Transients**, **Superluminous Supernovae**, and **Tidal Disruption Events**, as well as follow-up of **Gravitational Wave** sources with Dr. Edo Berger. Worked on observations of historical DASCH transients and light curve modeling of **X-ray Binaries** with Dr. Jonathan Grindlay.

Netherlands Institute for Space Research (2017) Did light curve modeling and spectral analysis of candidate X-ray binaries and **Cataclysmic Variables** from the Chandra Galactic Bulge Survey with Dr. Peter Jonker and Dr. Manuel A. P. Torres.

University of California, Santa Cruz (2014) Participated in the LAMAT summer program on high-performance computing working on relativistic hydrodynamical simulations of radio jets from microquasars with Dr. Enrico Ramirez-Ruiz.

Massachusetts Institute of Technology (2013) Participated in the MIT Summer Research Program analyzing Chandra X-ray spectra of the black hole Cygnus X-1 with Dr. Michael Nowak.

The University of Texas at El Paso (2012 - 2014) Worked on light curve modeling and analysis of optical photometry of X-ray binaries and Cataclysmic Variables with Dr. Paul Mason and Dr. Edward L. Robinson.

Proposals Accepted as PI

16 nights	Magellan 6.5m telescope
15 nights	MMT 6.5m telescope
5 nights	Fred Lawrence Whipple Observatory 60" telescope
12 nights	Fred Lawrence Whipple Observatory 48" telescope
7 orbits	Hubble Space Telescope / PID: GO 15863
2 hours	Very Large Array DDT / PID: 20A-409
2 hours	Gemini-North Observatory 8.1m telescope / PID: GN-2019A-DD-103
2.7 hours	Gemini-North Observatory 8.1m telescope / PID: GN-2019A-FT-201
1.23 hours	Gemini-North Observatory 8.1m telescope / PID: GN-2018A-FT-212

1 night	Las Cumbres Observatory 1m telescope / PID: 2017B-0057
5 nights	McDonald Observatory 82" Otto Struve / 2017
3 ks	Neil Gehrels Swift observatory / TargetID 00010975

Observing Experience

10+ nights	McDonald Observatory 82" Otto Struve / ARGOS + ProEM
10+ nights	MMT Observatory / Blue channel Spectrograph + MMTCam
7 nights	Magellan / LDSS3c + IMACS
4 nights	Fred Lawrence Whipple Observatory 48" / KeplerCam
4 nights	Roque de los Muchachos William Hershel Telescope / ISIS + ACAM
3 nights	McDonald Observatory 107" Harlan J. Smith / ARGOS
2 nights	Fred Lawrence Whipple Observatory 60" / FAST

Teaching/Advising Experience

2019 - 2021	Main research advisor for undergraduate student Yao Yin Harvard University
2018 - 2020	Co-advisor for undergraduate student Natasha Abrams Harvard University
Spring 2019	Teaching Fellow : Methods of Observational Astronomy Harvard University (Prof. Edo Berger)
Spring 2018	Teaching Fellow : Methods of Observational Astronomy Harvard University (Prof. Edo Berger)
Spring 2017	Teaching Fellow : The Unity of Science, From the Big Bang to the Brontosaurus Harvard University (Prof. Irwin Shapiro)
Summer 2016	Instructor : The UNIX Command Line Banneker Institute, Harvard University (Self developed)

Awards

2018	Outstanding teaching award for <i>Methods of Observational Astronomy</i>
2017	NSF Graduate Research Opportunities Worldwide (GROW) grant
2015-2018	NSF Graduate Research Fellowship (GRFP)
2015	Academic and Research Excellence Undergraduate Student in Physics at UTEP
2014	Chambliss Astronomy Achievement Student Medal awarded by the AAS
2013	NIH funded Maximizing Access to Research Careers (MARC) full ride scholarship
2012 & 2013	American Physical Society Minority Scholarship

Outreach and Service

	Referee for: Monthly Notices of the Royal Astronomical Society
2019	Served as a Peer Review Facilitator for a Chandra Cycle 21 review panel.
2016 - 2018	Mentor and Instructor for the Banneker Institute program at Harvard University. Designed to prepare undergraduate students of color for graduate programs.

2016 - 2019	Participated in the Application Review Committee for the MIT Summer Research Program
2016 - 2020	Leader for the Harvard Observing Project, a project to get local undergraduates involved in doing real astronomical observations.
2016	Served as a Peer Review Facilitator for a Chandra Cycle 18 review panel.
2012	Trained five students from the Transmountain Early College High School Distinguished Achievement Program on research and observational techniques.
2011 - 2014	Participated in over a dozen Physics Circus, an outreach activity designed by the Society of Physics Students to spread the knowledge of physics in El Paso, Texas.

Presentations

Talks	<p>Exotic Transients and How to Find Them</p> <ul style="list-style-type: none"> - <i>Compact Objects and Supernovae Journal Club</i>, STScl, 2020 - <i>Lunch Talk</i>, Carnegie Observatories, 2020 - <i>Science Happy Hour</i>, Northwestern University, 2020 - <i>BigBoom Meetings</i>, University of Arizona, 2020 - <i>Astro Lunch</i>, University of Washington, 2020 - <i>Galread Extragalactic Discussion Group</i>, Princeton University, 2020 - <i>Center for Theory and Computation Seminar</i>, University of Maryland, 2020
Invited Colloquium	<p>FLEET : Finding Luminous and Exotic Extragalactic Transients.</p> <ul style="list-style-type: none"> - <i>SRON Colloquia</i>, Utrecht, Netherlands., 2020
Invited Talk	<p>SN2016iet: A pair-instability supernova candidate, peculiar in every way.</p> <ul style="list-style-type: none"> - <i>ITC Luncheon</i>, Harvard University, Cambridge, MA., 2019
Conference Talk	<p>Searching for Superluminous Supernovae in Transient Alert Streams.</p> <ul style="list-style-type: none"> - <i>Hotwiring the Transient Universe Conference</i>, Evanston, IL., 2019
Poster	<p>Gomez, S., Blanchard, P. K., Nicholl, M., Berger, E., & Chronock, R. (2018). PS17brq, a Type Ic supernovae with signs of hydrogen-free interaction.</p> <ul style="list-style-type: none"> - <i>Shocking Supernovae Conference</i>. Stockholm, Sweden
Poster	<p>Gomez, S., & Grindlay, J. E. (2017). Optical Observations and Modeling of a Possible Black Hole HMXB and Cygnus X-1 Progenitor.</p> <ul style="list-style-type: none"> - <i>American Astronomical Society Meeting Abstracts</i>, 229, #247.02
Poster	<p>Gomez, S., & Grindlay, J. E. (2016). Identifying transient events in the DASCH database.</p> <ul style="list-style-type: none"> - <i>The Transient Sky</i>. Cambridge, MA
Poster	<p>Gomez, S., Mason, P. A. & Robinson, E. L. (2015). Combining Fits of The Optical Photometry and X-ray Spectra of the Low Mass X-ray Binary V1408 Aquilae.</p> <ul style="list-style-type: none"> - <i>American Astronomical Society Meeting Abstracts</i>, 225, #345.28.
Poster	<p>Gomez, S., Mason, P. A. & Robinson, E. L. (2014). The Orbital Light Curve of the Low-Mass X-ray Binary V1408 Aquilae.</p> <ul style="list-style-type: none"> - <i>American Astronomical Society Meeting Abstracts</i>, 224, #219.20

- Poster Gomez, S., Velazquez-Rizo, M., Montes, G., Ramirez-Ruiz, E. (2014). Understanding the Structure of Relativistic Jets Using Hydrodynamical Simulations.
- *5th Annual Summer Research Symposium. Santa Cruz, CA*
- Poster Gomez, S., Mason, P. A. & Robinson, E. L. (2014). Optical Observations of the Cataclysmic Variable FL Ceti, Evidence for a Decrease in Orbital Period.
- *American Astronomical Society Meeting Abstracts, 223, #154.12*
- Poster Gomez, S., Nowak, M. (2013). Determining the Relativistic Spin of the Black Hole Cygnus X-1.
- *TSF13 Meeting of the American Physical Society D1.00010*
- Poster Gomez, S., Mason, P. A. & Robinson, E. L. (2013). The Case for a Low Mass Black Hole in the LMXB V1408 Aquilae (= 4U 1957+115).
- *American Astronomical Society Meeting Abstracts, 221, #142.25*

Refereed Publications (8 First Author + 21 nth Author)

- 29 Blanchard, P. K, Berger, E., Nicholl, M., Chornock, R., **Gomez, S.**, and Hosseinzadeh, G. Late-Time Hubble Space Telescope Observations of a Hydrogen-Poor Superluminous Supernova Reveal the Power-Law Decline of a Magnetar Central Engine. Submitted to ApJ. arXiv:2105.03475
- 28 Álvarez-Hernández, A. et al. (incl. **Gomez, S.**) The intermediate polar cataclysmic variable GK Persei 120 years after the nova explosion: a first dynamical mass study. Accepted to MNRAS, arXiv:2107.06932
- 27 Hajela, A. et al. (incl. **Gomez, S.**). The emergence of a new source of X-rays from the binary neutron star merger GW170817. Submitted to ApJ, arXiv: 2104.02070
- 26 **Gomez, S.**, Berger, E., Hosseinzadeh, G., Blanchard, P.K., Nicholl, M., Villar, V. A. The Luminous and Double-Peaked Type Ic Supernova 2019stc: Evidence for Multiple Energy Sources. ApJ 913, 143
- 25 Alexander, K. D. Et al. (incl. **Gomez, S.**). A Late-Time Galaxy-Targeted Search for the Radio Counterpart of GW190814. Submitted to ApJ, arXiv: 2102.08957
- 24 **Gomez, S.**, M.A.P., Torres, Jonker, G. P., et al. Dynamical Modeling of CXOGBS J175553.2-281633: A 10 Hour Long Orbital Period Cataclysmic Variable. 2021, MNRAS, 502, 48
- 23 **Gomez, S.** and Grindlay, E. J. Optical Analysis and Modeling of HD96670, a Black Hole X-ray Binary Candidate in a Triple System. ApJ, 913, 48.
- 22 **Gomez, S.**, Berger, E., Blanchard, P.K., Hosseinzadeh, G., Nicholl, M., Villar, V. A., Yin, Y. FLEET: A Redshift-Agnostic Machine Learning Pipeline to Rapidly Identify Hydrogen-Poor Superluminous Supernovae. ApJ, 904, 74
- 21 Eftekhari, T. et al. (incl. **Gomez, S.**). Late-Time Radio and Millimeter Observations of Superluminous Supernovae and Long Gamma Ray Bursts: Implications for Obscured Star Formation, Central Engines, and Fast Radio Bursts. ApJ, 912, 21
- 20 Nicholl, M., et al. (incl. **Gomez, S.**). An outflow powers the optical rise of the nearby, fast-evolving tidal disruption event AT2019qiz. 2020, MNRAS, 499, 1
- 19 Jacobson-Galán et al. (incl. **Gomez, S.**). SN 2019ehk: A Double-peaked Ca-rich Transient with Luminous X-Ray Emission and Shock-ionized Spectral Features. 2020, ApJ, 898, 166.

- 18 Nicholl, M., Blanchard, P. K., Berger, E., Chornock, R., Margutti, R., **Gomez, S.**, et al. An extremely energetic supernova from a very massive star in a dense medium. 2020, *Nature Astronomy*, 10.1038 in the news: [Space.com](#), [Science Magazine](#), [CNN](#)
- 17 Short, P. Nicholl, M., Lawrence, A., **Gomez, S.** et al. The Tidal Disruption Event AT 2018hyz I: Double-peaked emission lines and a flat Balmer decrement. 2020, *MNRAS*, 498, 3
- 16 **Gomez, S.** et al. The Tidal Disruption Event AT 2018hyz II: Light Curve Modeling of a Partially Disrupted Star. 2020, *MNRAS*, 497, 1925.
- 15 Abrams, N. S., Bieryla, A., and **Gomez, S.** Measured Lightcurves and Rotational Periods of (16579) 1992 GO (25660) 2000 AO88, And (37652) 1994 JS1. 2020, *MPBu*, 47, 168.
- 14 Abrams, N. S., Bieryla, A., **Gomez, S.** et al. Measured Lightcurves and Rotational Periods of 3122 Florence, 3830 Trelleborg, and (131077) 2000 YH105. 2020, *MPBu*, 47, 3.
- 13 Hajela, A. et al. (*incl.* **Gomez, S.**). Two years of non-thermal emission from the binary neutron star merger GW170817: rapid fading of the jet afterglow and first constraints on the kilonova fastest ejecta. 2019, *ApJ*, 886, 17.
- 12 **Gomez, S.** et al. A Galaxy-Targeted Search for the Optical Counterpart of the Candidate NS-BH Merger S190814bv with Magellan. 2019, *ApJ*, 884, 55.
in the news: [Gizmodo](#)
- 11 Nicholl, M., Blanchard, P. K., Berger, E., **Gomez, S.**, et al. The tidal disruption event AT2017eqx: spectroscopic evolution from hydrogen rich to poor suggests an atmosphere and outflow. 2019, *MNRAS*, 488, 1878
- 10 **Gomez, S.**, Berger, E., Nicholl, M., Blanchard, P. K., Villar, V.A., Patton, L., Chornock, R., Leja, J., Hosseinzadeh, G., Cowperthwaite, P. S. SN 2016iet: The Pulsational or Pair Instability Explosion of a Low-metallicity Massive CO Core Embedded in a Dense Hydrogen-poor Circumstellar Medium. 2019, *ApJ*, 881, 87
in the news: [Quanta Magazine](#), [Discover](#), [National Geographic](#), [Astronomy.com](#), [Gizmodo](#)
- 9 Hosseinzadeh, G., Cowperthwaite, P. S., **Gomez, S.**, Villar, V. A., Nicholl, M., Margutti, R. Follow-up of the Neutron Star Bearing Gravitational-wave Candidate Events S190425z and S190426c with MMT and SOAR. 2019, *ApJ*, 880, 4
- 8 Blanchard, P. K. et al. (*incl.* **Gomez, S.**). A Hydrogen-poor Superluminous Supernova with Enhanced Iron-group Absorption: A New Link between SLSNe and Broad-lined Type Ic SNe. 2019, *ApJ*, 872, 90
- 7 Nicholl, M., Berger, E., Blanchard, P. K., **Gomez, S.**, Chornock, R. Nebular-phase Spectra of Superluminous Supernovae: Physical Insights from Observational and Statistical Properties. 2019, *ApJ*, 871, 102
- 6 Scott, S., Nicholl, M., Blanchard, P. K., **Gomez, S.**, Berger, E. Bright Type IIP Supernovae in Low-metallicity Galaxies. 2019, *ApJ*, 870, 16
- 5 Nicholl, M., et al. (*incl.* **Gomez, S.**). One Thousand Days of SN2015bn: HST Imaging Shows a Light Curve Flattening Consistent with Magnetar Predictions. 2018, *ApJ*, 866, 24
- 4 Villar, V. A., Cowperthwaite, P. S., Berger, E., Blanchard, P. K., **Gomez, S.**, et al. Spitzer Space Telescope Infrared Observations of the Binary Neutron Star Merger GW170817. 2018, *ApJ*, 862, 11

- 3 **Gomez, S.**, Mason, P. A., Robinson, E. L. The Case for a Low Mass Black Hole in the Low Mass X-ray Binary V1408 Aquilae (= 4U 1957+115). 2015, ApJ, 809, 9
- 2 Mason, P. A., Robinson, E. L., **Gomez, S.** Optical Photometry of LMXBs: UW CrB and V1408 Aql (=4U 1957+115). *Acta Polytechnica CTU, 2015, Vol 2, No. 1.*
- 1 Mason, P. A., Zhilkin, A. G., Bisikalo, D. V., **Gomez, S.**, Morales, J. Robinson, E. L., Ustyugov, V. A. Photometry and Multipolar Magnetic Field Modeling of Polars BY Camelopardalis and FL Ceti. *Acta Polytechnica CTU, 2015, Vol 2, No. 1.*

Other Publications

- Dauphin, F., Hosseinzadeh, G., Villar, V., Berger, E., Gomez, S. Photometric Classification of Transients from the Pan-STARRS1 Medium-Deep Survey. American Astronomical Society Meeting Abstracts, 235, #276.18.
- Chou, N., Villar, V., Berger, E., Gomez S., Hosseinzadeh, G., Host Galaxy Based Supernova Classification with Machine Learning. American Astronomical Society Meeting Abstracts, 235, #276.23.
- Abrams, N. S., Bieryla, A., Gomez, S., et al. Developing methods of determining unknown rotational periods of asteroids via observations of (3122) Florence by the Harvard Observing Project. American Astronomical Society Meeting Abstracts, 232, #121.03.
- Grindlay, J. E., Miller, G., & Gomez, S. (2018). 100y DASCH Search for historical outbursts of Black Hole Low Mass X-ray Binaries. American Astronomical Society Meeting Abstracts, 231, #423.06.
- Grindlay, J. E., Gomez, S., Hong, J., Zhang, S., Hailey, C., Mori, K., J. & Tomsick, J. (2017) Discovery of a Probable BH-HMXB and Cyg X-1 Progenitor System. American Astronomical Society Meeting HEAD Abstracts, 16, #109.14
- Espinell, J. L., et al. (incl. Gomez, S.). (2017) Recent Observations of AG Pegasi's Latest Outburst Phase by Harvard Observing Project. American Astronomical Society Meeting Abstracts, 229, #243.07
- Schumer, C. F., et al. (incl. Gomez, S.). (2017) Harvard Observing Project monitoring of Boyajian's Star (KIC 8462852). American Astronomical Society Meeting Abstracts, 229, #229.32
- Sundin, E., Mason, P. A., Robinson, E. L., Morales, J., Gomez, S., Gonzalez, R., Lopez, I. & Bell, K. (2014). Simultaneous Filter Photometry of V1727 Cygni. American Astronomical Society Meeting Abstracts, 223, #155.35.
- Mason, P. A., Gomez, S., Robinson, E. L., Andronov, I. L. & Gonzalez, R. I. (2013). High Speed Optical Observations of Cataclysmic Variables: FL Ceti, BY Cam, and DQ Her. American Astronomical Society Meeting Abstracts, 221, #401.02
- Mason, P. A., Robinson, E. L., Gomez, S., Gonzalez, M., Lopez, I. D., Monroy, L., Price, A. (2013). High Speed Optical Photometry of LMXBs and CVs. IAU Symposium, 290, 133.

Technical Skills

Software

Data analysis: IRAF, ISIS, PHOEBE, Molly
 Other Software: LaTeX, Adobe Creative Suite.
 Programming languages: Python, S-Lang, HTML

Languages

Spanish (Native proficiency)
 English (Bilingual proficiency)
 ASL (Limited working proficiency)

Last Updated: September 5, 2021