

SEBASTIAN GOMEZ

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Education

Expected 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) <i>Summa Cum Laude</i> <i>MARC Honor Thesis: The Case for a Low Mass Black Hole in the X-ray Binary V1408 Aquilae</i>
2011	Tecnológico de Monterrey, Ciudad Juárez, México <i>With Honors</i>

Research Experience in Time-Domain Astronomy

Harvard University (2015 -)	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 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.

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

Proposals Accepted as PI

	CfA Telescope Time
9 nights	Magellan 6.5m telescope
5 nights	Fred Lawrence Whipple Observatory 60" telescope
12 nights	Fred Lawrence Whipple Observatory 48" telescope
15 nights	MMT 6.5m telescope
2 hours	Very Large Array DDT / PID: 20A-409
7 orbits	Hubble Space Telescope / PID: GO 15863
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

Teaching/Advising Experience

2020 -	Main research advisor for undergraduate student Yao Yin Harvard University
2018 -	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 Methods of Observational Astronomy
2017	NSF Graduate Research Opportunities Worldwide (GROW) award.
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.
2014	Junior of the Year award by the Physics department at UTEP.
2013	Maximizing Access to Research Careers (MARC) full ride research fellowship funded by the National Institute of Health (NIH).
2012 & 2013	American Physical Society Minority Scholarship.

Outreach and Service

2020 - Present	Referee for: Monthly Notices of the Royal Astronomical Society
2019	Served as a Chandra Peer Review Facilitator for a Chandra Cycle 21 review panel.
2016 - 2019	Participated in the Application Review Committee for the MIT Summer Research Program
2016 - Present	Actively involved in the Harvard Observing Project, with the goal of getting local undergraduates involved in doing real astronomical observations.
2016	Served as a Chandra 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

Invited Colloquium	FLEET : Finding Luminous and Exotic Extragalactic Transients. <i>SRON Colloquia</i> , Utrecht, Netherlands., 2020
Invited Talk	SN2016iet: A pair-instability supernova candidate, peculiar in every way. <i>ITC Luncheon</i> , Harvard University, Cambridge, MA., 2019
Conference Talk	Searching for Superluminous Supernovae in Transient Alert Streams. <i>Hotwiring the Transient Universe Conference</i> , Evanston, IL., 2019
Poster	Gomez, S., Blanchard, P. K., Nicholl, M., Berger, E., & Chronock, R. (2018). PS17brq, a Type Ic supernovae with signs of hydrogen-free interaction. <i>Shocking Supernovae Conference</i> . Stockholm, Sweden
Poster	Gomez, S., & Grindlay, J. E. (2017). Optical Observations and Modeling of a Possible Black Hole HMXB and Cygnus X-1 Progenitor. <i>American Astronomical Society Meeting Abstracts</i> , 229, #247.02
Poster	Gomez, S., & Grindlay, J. E. (2016). Identifying transient events in the DASCH database. <i>The Transient Sky, Harvard-Smithsonian Conference on Theoretical Astrophysics</i> . Cambridge, MA
Poster	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. <i>American Astronomical Society Meeting Abstracts</i> , 225, #345.28.
Poster	Gomez, S., Mason, P. A. & Robinson, E. L. (2014). The Orbital Light Curve of the Low-Mass X-ray Binary V1408 Aquilae. <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. <i>5th Annual Summer Research Symposium</i> . 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

Publications (7 First Author + 16 nth Author)

- 23 **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. Submitted to MNRAS. arXiv: 2009.08983
- 22 **Gomez, S.** and Grindlay, E. J. Optical Analysis and Modeling of HD96670, a Black Hole X-ray Binary Candidate in a Triple System. Submitted to ApJ.
- 21 **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. Submitted to ApJ. arXiv: 2009.01853
- 20 Nicholl, M., et al. (*incl. Gomez, S.*). An outflow powers the optical rise of the nearby, fast-evolving tidal disruption event AT2019qiz. Accepted to MNRAS, arXiv: 2006.02454
- 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, submitted to MNRAS, arxiv:2003.05470
- 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
- Espinel, 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.

Astronomer's Telegrams (ATels):

12602, 12478, 12052, 11860, 11714, 11648, 11255, 11204

Gamma-ray Coordination Network (GCN) :

27414, 27357, 25631, 25483, 25382, 25366, 24321, 24292, 24244, 24182, 24000, 23987, 23986

Transient Name Server Classification Reports (TNSCR) :

2478, 569, 181, 2528, 2270, 2269, 2161, 1703, 1702, 1643, 1494, 1400, 1355, 1354, 1016, 974, 693, 579, 416, 1246, 1423, 653, 160, 89

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)

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