

SEBASTIAN GOMEZ  
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## Research Positions

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STScI Postdoctoral Fellow at Space Telescope Science Institute 2021 - present  
*Prize fellowship (50% independent science + 50% work for Roman Space Telescope)*

## Education

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Harvard University: Ph.D. in Astronomy and Astrophysics 2021  
Harvard University: M.A. in Astronomy and Astrophysics 2017  
The University of Texas at El Paso (UTEP): B.S. in Physics - *Summa Cum Laude* 2015  
Tecnológico de Monterrey, Ciudad Juárez, México: High School 2011

## Selected Awards

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Outstanding Teaching Award (Harvard University) 2018  
NSF Graduate Research Opportunities Worldwide (GROW) grant 2017  
NSF Graduate Research Fellowship (GRFP) 2015 - 2018  
Academic and Research Excellence Undergraduate Student in Physics at UTEP 2015  
Chambliss Astronomy Achievement Student Medal awarded by the AAS 2014  
NIH Maximizing Access to Research Careers (MARC) full ride scholarship 2013  
American Physical Society Minority Scholarship 2012 - 2013

## Research Experience

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Experienced with optical observations of **Exotic Transients, Superluminous Supernovae, Tidal Disruption Events**, follow-up of **Gravitational Waves** sources, implementation of **Machine Learning** methods to optimize transient searches, and modeling light curves of **X-ray Binaries**.

Graduate Research Assistant 2015 - 2021  
*Harvard University - advised by Dr. Edo Berger & Dr. Jonathan Grindlay*  
GROW Fellow 2017  
*Netherlands Institute for Space Research - advised by Dr. Peter Jonker & Dr. M. A. P. Torres*  
LAMAT Intern 2014  
*University of California, Santa Cruz - advised by Dr. Enrico Ramirez-Ruiz*  
MSRP Intern 2013  
*Massachusetts Institute of Technology - advised by Dr. Michael Nowak*  
Undergraduate Research Assistant 2012 - 2014  
*The University of Texas at El Paso - advised by Dr. Paul Mason & Dr. Edward Robinson*

## Observing Experience

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McDonald Observatory 82" Otto Struve / ARGOS + ProEM (**10+ nights**); MMT Observatory / Blue channel Spectrograph + MMTcam (**10+ nights**); Magellan / LDSS3c + IMACS (**8 nights**); Fred Lawrence Whipple Observatory 48" / KeplerCam (**4 nights**); Roque de los Muchachos William Hershel Telescope / ISIS + ACAM (**4 nights**); McDonald Observatory 107" Harlan J. Smith / ARGOS (**3 nights**); Fred Lawrence Whipple Observatory 60" / FAST (**2 nights**)

## Telescope Proposals Accepted as PI

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<u>Magellan 6.5m</u> 16 nights (6 proposals)	<u>Hubble Space Telescope</u> 7 orbits (PID: GO 15863)
<u>MMT 6.5m</u> 15 nights (4 proposals)	<u>Very Large Array</u> 2 hours (PID: 20A-409)
<u>F. L. Whipple Observatory 60"</u> 5 nights (4 proposals)	<u>Las Cumbres Observatory 1m</u> 1 night (PID: 2017B-0057)
<u>F. L. Whipple Observatory 48"</u> 12 nights (4 proposals)	<u>McDonald Observatory 82" Otto Struve</u> 5 nights (1 proposal)
<u>Gemini Observatory 8.1m</u> 6 hours (PID: GS-2021B-FT-208) 2 hours (PID: GN-2019A-DD-103) 2.7 hours (PID: GN-2019A-FT-201) 1.2 hours (PID: GN-2018A-FT-212)	<u>Neil Gehrels Swift observatory</u> 3ks (ID: 10975) 8ks (ID: 14892)

## Teaching & Advising Experience

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Primary advisor for undergraduate student Yao Yin <i>Harvard University - 1 peer reviewed publication</i>	2019 - present
Co-advisor for undergraduate student Natasha Abrams <i>Harvard University - 2 peer reviewed publications</i>	2018 - 2020
Teaching Fellow : Methods of Observational Astronomy <i>Harvard University (Prof. Edo Berger)</i>	Spring 2019
Teaching Fellow : Methods of Observational Astronomy <i>Harvard University (Prof. Edo Berger) -</i>	Spring 2018
Teaching Fellow : The Unity of Science, From the Big Bang to the Brontosaurus <i>Harvard University (Prof. Irwin Shapiro)</i>	Spring 2017
Course designer and Instructor : The UNIX Command Line <i>Banneker Institute, Harvard University</i>	Summer 2016

## Outreach and Service

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Referee for: <i>MNRAS, Nature Astronomy</i>	
Peer Review Facilitator during Chandra Cycle 18 & 21	2016, 2019
Mentor and Instructor - Banneker Institute <i>A program at Harvard University designed to prepare undergraduate students of color for graduate programs.</i>	2016 - 2018
Member of Application Review Committee for the MIT Summer Research Program	2016 - 2019
Leader for the Harvard Observing Project <i>A project to get local undergraduates involved in doing real astronomical observations.</i>	2016 - 2020
Mentor for Transmountain Early College High School Distinguished Achievement Program <i>Trained five high achieving students on research and observational techniques</i>	2012
Physics Circus Volunteer <i>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.</i>	2011 - 2014

## Presentations

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Invited Outreach Talk	Exotic Supernovae <i>Mars Generation, ITESM, Ciudad Juárez, Mexico, 2021 (virtual)</i>
Invited Outreach Talk	Exotic Supernovae <i>JPL Solar System Ambassadors, Las Cruces, NM, 2021 (virtual)</i>
Invited Outreach Talk	Cosmic Explosions <i>Harmony High School, El Paso, TX, 2021 (virtual)</i>
<b>Invited Talk</b>	Exotic Transients and How to Find Them <i>Compact Objects and Supernovae Journal Club, STScI, 2020</i>
Talk	Exotic Transients and How to Find Them <i>Lunch Talk, Carnegie Observatories, 2020</i>
Talk	Exotic Transients and How to Find Them <i>Science Happy Hour, Northwestern University, 2020</i>
Talk	Exotic Transients and How to Find Them <i>BigBoom Meetings, University of Arizona, 2020</i>
Talk	Exotic Transients and How to Find Them <i>Astro Lunch, University of Washington, 2020</i>
Talk	Exotic Transients and How to Find Them <i>Galread Extragalactic Discussion Group, Princeton University, 2020</i>
Talk	Exotic Transients and How to Find Them <i>Center for Theory and Computation Seminar, University of Maryland, 2020</i>
<b>Invited Colloquium</b>	FLEET : Finding Luminous and Exotic Extragalactic Transients. <i>SRON Colloquia, Utrecht, Netherlands., 2020</i>
<b>Invited Talk</b>	SN2016iet: A pair-instability supernova candidate, peculiar in every way. <i>ITC Luncheon, Harvard University, Cambridge, MA., 2019</i>
Conference Talk	Searching for Superluminous Supernovae in Transient Alert Streams. <i>Hotwiring the Transient Universe Conference, Evanston, IL., 2019</i>

### Poster Presentations:

- PS17brq, a Type Ic supernovae with signs of hydrogen-free interaction.  
*Shocking Supernovae Conference. Stockholm, Sweden (2018).*
- Optical Observations and Modeling of a Possible Black Hole HMXB and Cygnus X-1 Progenitor.  
*AAS 229th Meeting, Grapevine, TX (2017).*
- Identifying transient events in the DASCH database.  
*The Transient Sky. Cambridge, MA (2016).*
- Combining Fits of The Optical Photometry and X-ray Spectra of the Low Mass X-ray Binary V1408 Aquilae.  
*AAS 225th Meeting, Seattle, WA (2015).*
- The Orbital Light Curve of the Low-Mass X-ray Binary V1408 Aquilae.  
*AAS 225th Meeting, Boston, MA (2014).*
- Understanding the Structure of Relativistic Jets Using Hydrodynamical Simulations.  
*5th Annual Summer Research Symposium. Santa Cruz, CA (2014).*
- Optical Observations of the Cataclysmic Variable FL Ceti, Evidence for a Decrease in Orbital Period.  
*AAS 223rd Meeting, National Harbor, MD (2014).*
- Determining the Relativistic Spin of the Black Hole Cygnus X-1.  
*TSF13 Meeting of the American Physical Society (2013).*
- The Case for a Low Mass Black Hole in the LMXB V1408 Aquilae.  
*AAS 221st Meeting, Long Beach, CA (2013).*

- 35 **Gomez, S.**, Berger, E., Nicholl, M., Blanchard, P.K., and Hosseinzadeh, G., Luminous Supernovae: Unveiling a Population Between Superluminous and Normal Core-collapse Supernovae. 2022, Submitted to ApJ, arXiv: 2204.08486
- 34 Hosseinzadeh, G., et al. (incl. **Gomez, S.**) Weak Mass Loss from the Red Supergiant Progenitor of the Type II SN 2021yja. 2022, Submitted to ApJ, arXiv:2203.08155.
- 33 Fox, O. D., et al. (incl. **Gomez, S.**) The Candidate Progenitor Companion Star of the Type Ib/c SN 2013ge. 2022, ApJ, 929, 15.
- 32 Fiore, A., et al. (incl. **Gomez, S.**). Close, bright and boxy: the superluminous SN 2018hti. MNRAS, 512, 4484.
- 31 **\*Yin, Y., Gomez, S.**, et al. Optical Observations and Modeling of the Superluminous Supernova 2018lfe. Accepted to ApJ, 2021, arXiv: 2109.06970
- 30 Hosseinzadeh, G., Berger, E., Metzger, B. D., **Gomez, S.**, et al. Bumpy Declining Light Curves are Common in Hydrogen-poor Superluminous Supernovae. Submitted to ApJ. 2021, arXiv:2109.09743
- 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. 2021, ApJ, 921, 64.
- 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. 2021, MNRAS, 507, 4
- 27 Hajela, A. et al. (incl. **Gomez, S.**). Evidence for X-Ray Emission in Excess to the Jet-afterglow Decay 3.5 yr after the Binary Neutron Star Merger GW 170817: A New Emission Component. 2022, ApJ, 927, 17.
- 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. 2021, ApJ 913, 143
- 25 Alexander, K. D. Et al. (incl. **Gomez, S.**). A Late-Time Galaxy-Targeted Search for the Radio Counterpart of GW190814. 2021, ApJ, 923, 66.
- 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. 2021, 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. 2020, 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 Central Engines, Fast Radio Bursts, and Obscured Star Formation. 2021, 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](https://www.space.com), [Science Magazine](https://www.sciencemagazine.com), [CNN](https://www.cnn.com)
- 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 / Proceedings

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**Gomez, S.**, Berger, E., Blanchard, P.K., Hosseinzadeh, G., Nicholl, M., Villar, V. A., Yin, Y. FLEET: Finding Luminous and Exotic Extragalactic Transients. 2021, Zenodo.4013965

Chornock, R., et al. (*incl. Gomez, S.*) Multi-Messenger Astronomy with Extremely Large Telescopes. 2019, Decadal Survey on Astronomy and Astrophysics, science white papers, no. 237

- First author of **54** Astronomer's Telegrams, GCN Circulars, or AstroNotes
- Co-author of **24** Astronomer's Telegrams, GCN Circulars, or AstroNotes

## Technical Skills

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### Software

Data analysis: IRAF, ISIS, PHOEBE, Molly

Other Software: LaTeX, Adobe Creative Suite.

Programming languages: Python, S-Lang, HTML

Last Updated: May 16, 2022

### Languages

Spanish (Native proficiency)

English (Bilingual proficiency)

ASL (Limited working proficiency)