

Jean Somalwar

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Education

California Institute of Technology , PhD Astrophysics	2020 - 2025
• Thesis: The rate and diversity of tidal disruption events	
• Advisor: Prof. Vikram Ravi	
Princeton University , AB Physics	2017 – 2020
• Senior Thesis: (<i>Prof. Jenny Greene</i>) Globular Clusters in Ultra-Diffuse Galaxies	

Research Interests

Novel observational probes of massive black hole formation and evolution.
Multimessenger time-domain astrophysics.

Research Positions

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- Kavli Fellow, UC Berkeley (2025-Present)
 - MultiRAPTOR Postdoctoral Fellow, UC Berkeley (2025-Present)
 - Graduate Student (*Prof. Vikram Ravi*), California Institute of Technology (2020-2025)
 - Research Assistant/Senior thesis (*Prof. Jenny Greene*) Princeton University (2019-2020)
 - Undergraduate Research Assistant/Junior thesis (*Prof. Mariangela Lisanti*) Princeton University (2018-2020)
 - Junior thesis student (*Prof. Michael Romalis*) Princeton University (Fall 2018)
 - Research Student (*Prof. Eva Halkiadakis*) Rutgers University (2015-2017)

Observing Experience and Awarded Time

I have been PI on multiple funded proposals from major space telescopes (9 orbits *HST*, 60 ks *NuSTAR*). I have also been the PI on proposals using the Neils Gehrel Swift Telescope, XMM-Newton Telescope, Very Large Array, Australian Telescope Compact Array, and Palomar 200 inch Telescope. I have significant experience preparing and executing observations with all of these facilities, as well as $\gtrsim 40$ nights on the Keck Telescopes, 3 nights on the Magellan telescopes, and $\gtrsim 10$ nights on the Palomar 200 inch. I am a trained observer on the Australian Telescope Compact Array, with 30 hours of experience.

Hubble Space Telescope: PI (9 orbits, funded), Co-I (>60 orbits)

NuSTAR: PI on 60 ks regular proposals (funded) + 60 ks DDT

Neils Gehrel Swift Telescope: PI on >60 ks of DDTs

XMM-Newton Telescope: PI on >100 ks of DDTs

Chandra Telescope: PI on 100 ks GO, 20ks DDT

Very Large Array: PI on > 10 hours, co-I on > 100 hours

Australian Telescope Compact Array: PI (30 hours), trained observer

Palomar/Keck Telescope: PI (six nights + 10×30min TOO), co-I on > 30 nights

Honors and Awards

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- Garmire Scholar (2024)
 - National Science Foundation Graduate Research Fellow (2021-2023)
 - Caltech Graduate Student Council Mentorship Award (2023)
 - 2022 Keck Institute for Space Studies (KISS) Affiliate (Dec 2021)

- Allen G. Shenstone Prizes for Academic and Research Excellence (June 2018, June 2019)
- Bell-Burnell Award (June 2018)

Teaching

- TA, introduction to classical mechanics
- TA, graduate radio astronomy

Advising

- Dylan Perez (Summer 2024) - lead mentor
- Thuwaragesh Jayachandran (Summer 2024) - SURF program, lead mentor
- Nitya Nigam (Summer 2024-present) - SURF program, lead mentor
- Matilda Eriksson (Summer 2023) - WAVE program, co-mentor
- Rey Squillace (Summer 2022) - SURF program, co-mentor

Publications

First Author Publications

- [1] Jean J. Somalwar and Vikram Ravi. “The Origin of the Nano-Hertz Stochastic Gravitational-wave Background: The Contribution from $z \gtrsim 1$ Supermassive Black Hole Binaries”. In: *ApJ* 982.2, 195 (Apr. 2025), p. 195. DOI: 10.3847/1538-4357/adbc62. arXiv: 2306.00898 [astro-ph.GA].
- [2] Jean J. Somalwar, Vikram Ravi, and Wenbin Lu. “VLASS Tidal Disruption Events with Optical Flares. II. Discovery of Two TDEs with Intermediate Width Balmer Emission Lines and Connections to the Ambiguous Extreme Coronal Line Emitters”. In: *ApJ* 983.2, 159 (Apr. 2025), p. 159. DOI: 10.3847/1538-4357/ad002. arXiv: 2310.03795 [astro-ph.HE].
- [3] Jean J. Somalwar et al. “A luminous and hot infrared through X-ray transient at a 5 kpc offset from a dwarf galaxy”. In: *ApJ*, in press. (Oct. 2025). arXiv: 2505.11597 [astro-ph.HE].
- [4] Jean J. Somalwar et al. “The First Systematically Identified Repeating Partial Tidal Disruption Event”. In: *ApJ* 985.2, 175 (June 2025), p. 175. DOI: 10.3847/1538-4357/adcc19. arXiv: 2310.03782 [astro-ph.HE].
- [5] Jean J. Somalwar et al. “VLASS Tidal Disruption Events with Optical Flares. I. The Sample and a Comparison to Optically Selected TDEs”. In: *ApJ* 982.2, 163 (Apr. 2025), p. 163. DOI: 10.3847/1538-4357/adba4f. arXiv: 2310.03791 [astro-ph.HE].
- [6] Jean J. Somalwar et al. “A Candidate Relativistic Tidal Disruption Event at 340 Mpc”. In: *ApJ* 945.2, 142 (Mar. 2023), p. 142. DOI: 10.3847/1538-4357/acbafc. arXiv: 2207.02873 [astro-ph.HE].
- [7] Jean J. Somalwar et al. “The Nascent Milliquasar VT J154843.06+220812.6: Tidal Disruption Event or Extreme Accretion State Change?” In: *ApJ* 929.2, 184 (Apr. 2022), p. 184. DOI: 10.3847/1538-4357/ac5e29. arXiv: 2108.12431 [astro-ph.HE].
- [8] Jean J. Somalwar et al. “Harnessing the Population Statistics of Subhalos to Search for Annihilating Dark Matter”. In: *ApJ* 906.1, 57 (Jan. 2021), p. 57. DOI: 10.3847/1538-4357/abc87d. arXiv: 2009.00021 [astro-ph.CO].
- [9] Jean Somalwar et al. “Spatially Resolved UV Diagnostics of AGN Feedback: Radiation Pressure Dominates in a Prototypical Quasar-driven Superwind”. In: *ApJL* 890.2, L28 (Feb. 2020), p. L28. DOI: 10.3847/2041-8213/ab733d. arXiv: 2002.02454 [astro-ph.GA].
- [10] Jean J. Somalwar et al. “Hyper Suprime-Cam Low Surface Brightness Galaxies. II. A Hubble Space Telescope Study of the Globular Cluster Systems of Ultradiffuse Galaxies in Groups”. In: *ApJ* 902.1, 45 (Oct. 2020), p. 45. DOI: 10.3847/1538-4357/abb1b2. arXiv: 2008.02806 [astro-ph.GA].

All Publications

- [1] Jakob T. Faber et al. “A Heavily Scattered Fast Radio Burst Is Viewed Through Multiple Galaxy Halos”. In: *arXiv e-prints*, arXiv:2405.14182 (May 2024), arXiv:2405.14182. DOI: 10.48550/arXiv.2405.14182. arXiv: 2405.14182 [astro-ph.HE].
- [2] A. C. S. Readhead et al. “Compact Symmetric Objects. III. Evolution of the High-luminosity Branch and a Possible Connection with Tidal Disruption Events”. In: *ApJ* 961.2, 242 (Feb. 2024), p. 242. DOI: 10.3847/1538-4357/ad0c55.
- [3] Yashvi Sharma et al. “Dramatic Rebrightening of the Type-changing Stripped-envelope Supernova SN 2023aew”. In: *ApJ* 966.2, 199 (May 2024), p. 199. DOI: 10.3847/1538-4357/ad3758.
- [4] Myles B. Sherman et al. “Deep Synoptic Array Science: Polarimetry of 25 New Fast Radio Bursts Provides Insights into Their Origins”. In: *ApJ* 964.2, 131 (Apr. 2024), p. 131. DOI: 10.3847/1538-4357/ad275e.
- [5] Yuhan Yao et al. “Sub-relativistic Outflow and Hours-Timescale Large-amplitude X-ray Dips during Super-Eddington Accretion onto a Low-mass Massive Black Hole in the Tidal Disruption Event AT2022lri”. In: *arXiv e-prints*, arXiv:2405.11343 (May 2024), arXiv:2405.11343. DOI: 10.48550/arXiv.2405.11343. arXiv: 2405.11343 [astro-ph.HE].
- [6] Liam Connor et al. “Deep Synoptic Array Science: Two Fast Radio Burst Sources in Massive Galaxy Clusters”. In: *ApJL* 949.2, L26 (June 2023), p. L26. DOI: 10.3847/2041-8213/acd3ea.
- [7] Liam Connor et al. “Deep Synoptic Array science: Two fast radio burst sources in massive galaxy clusters”. In: *arXiv e-prints*, arXiv:2302.14788 (Feb. 2023), arXiv:2302.14788. DOI: 10.48550/arXiv.2302.14788. arXiv: 2302.14788 [astro-ph.HE].
- [8] Erica Hammerstein et al. “The Final Season Reimagined: 30 Tidal Disruption Events from the ZTF-I Survey”. In: *ApJ* 942.1, 9 (Jan. 2023), p. 9. DOI: 10.3847/1538-4357/aca283.
- [9] Vikram Ravi et al. “Deep Synoptic Array science: a 50 Mpc fast radio burst constrains the mass of the Milky Way circumgalactic medium”. In: *arXiv e-prints*, arXiv:2301.01000 (Jan. 2023), arXiv:2301.01000. DOI: 10.48550/arXiv.2301.01000. arXiv: 2301.01000 [astro-ph.GA].
- [10] Kritti Sharma et al. “Deep Synoptic Array Science: A Massive Elliptical Host Among Two Galaxy-cluster Fast Radio Bursts”. In: *ApJ* 950.2, 175 (June 2023), p. 175. DOI: 10.3847/1538-4357/accf1d.
- [11] Myles B. Sherman et al. “Deep Synoptic Array Science: Implications of Faraday Rotation Measures of Fast Radio Bursts Localized to Host Galaxies”. In: *ApJL* 957.1, L8 (Nov. 2023), p. L8. DOI: 10.3847/2041-8213/ad0380.
- [12] Yuhan Yao et al. “Tidal Disruption Event Demographics with the Zwicky Transient Facility: Volumetric Rates, Luminosity Function, and Implications for the Local Black Hole Mass Function”. In: *ApJL* 955.1, L6 (Sept. 2023), p. L6. DOI: 10.3847/2041-8213/acf216.
- [13] Igor Andreoni et al. “A very luminous jet from the disruption of a star by a massive black hole”. In: *Nature* 612.7940 (Dec. 2022), pp. 430–434. DOI: 10.1038/s41586-022-05465-8.
- [14] Vikram Ravi et al. “The host galaxy and persistent radio counterpart of FRB 20201124A”. In: *MNRAS* 513.1 (June 2022), pp. 982–990. DOI: 10.1093/mnras/stac465.

Talks

Invited Talks

- Kavli Institute for Theoretical Physics “Anticipating the Rising Tide of Tidal Disruption Events: Theory and Observations”, Apr. 2024, KITP Santa Barbara: *Discovering Tidal Disruption Events in Radio Surveys*
- American Astronomical Society Meeting 241, Jan 2023, Seattle WA: *You have found the host galaxy of a transient. What next?*
- VLASS transients workshop, Oct 2021, Virtual: *The nascent milliquasar VT J154843.06+220812.6: tidal disruption event or extreme accretion-state change?*
- Joint Space-Science Institute Workshop, “Winds throughout the Universe”, Oct 2023, Annapolis MD: *Jets, Outflows, and Winds from Tidal Disruption Events*

- ASKAP Variables and Slow Transients Meeting, Sept. 2023, virtual: *“Tidal disruption events in VLASS”*

Selected Contributed Talks

- IPTA 2024 Science Week, Jun. 2024, Sexten IT: *Constraining the origin of the nHz GWB using a simple flexible model of black hole evolution*
- Intermediate-Mass Black Holes: the dawn of a revolutionary era, Dec 2023, Belize: *A blind radio search for tidal disruption events and implications for IMBHs*
- MIT Monday Afternoon Talk, May 2023, Cambridge MA: *Tidal disruption events in the VLA Sky Survey*
- Columbia Theoretical High Energy Astrophysics Seminar, May 2023, New York, NY: *Tidal disruption events in the VLA Sky Survey*
- Naval Research Laboratory Talk Series, Apr. 2023, Washington DC: *Tidal disruption events in the VLA Sky Survey*
- NRAO Lunch Talk, Apr 2023, Socorro NM: *Tidal disruption events in the VLA Sky Survey*
- Radboud Lunch Journal Club, Jun. 2023, Nijmegen NL: *Tidal disruption events in the VLA Sky Survey*
- New frontiers in supermassive black holes, Oct 2022, Cornell: *Searching for radio TDEs with the VLA Sky Survey*
- The VLA Sky Survey in the Multiwavelength Spotlight, Sept. 2022, Socorro NM: *Tidal disruption events in VLASS*

Professional Service

- Referee for MNRAS, ApJ, A&A
- Interviewer for Caltech graduate astronomy admissions committee
- UC Berkeley colloquium committee, Spring 2026

Outreach and Diversity

- Astro on tap talk, “How do supermassive black holes form?”, May 20 2024 and Sep 9 2025
- Graduate School Panel, Carnegie Observatories, July 2023
- Panelist, astro star gazing lectures, May 2023/Aug 2024
- Grad student mentor, 2023
- Volunteer, Astro on Tap, 2023-2024