Gokul P. Srinivasaragavan

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Summary and Research interests

Time-domain astronomy; Multi-messenger astronomy; gamma-ray burst afterglows; broadlined Ic supernovae; orphan afterglows, fast blue optical transients, physics of relativistic explosions.

Current/upcoming work:
– Discovering and analyzing supernovae associated with gamma-ray bursts
– Analyzing the broadlined Type Ic supernovae population from the Zwicky Transient Facility
– Studying relativistic transients without gamma-ray triggers (orphan afterglows, fast blue optical transients, etc.)
– Preparatory work for ULTRASAT

Education

Ph.D. Candidate in Astronomy – *University of Maryland, College Park* (Jan 2024 to Present)

M.S. in Astronomy – *University of Maryland, College Park* (Aug 2021 to May 2023)

B.S. in Astrophysics – *California Institute of Technology* (Sep 2017 to June 2021)

Research Experience

- Ph.D. student/candidate in Astronomy (Advisor: Dr. S. Bradley Cenko) (August 2021 to present)

  University of Maryland, College Park, College Park, MD USA

  NASA Goddard Space Flight Center, Greenbelt, MD USA

- Undergraduate Research Assistant (Advisor: Prof. Mansi Kasliwal) (Jan 2020 to Jun 2021)

  California Institute of Technology, Pasadena, CA USA

- Student Undergrad Laboratory Internship Intern (Advisor: Dr. Maria Dainotti) (Jun 2020 to Aug 2020)

  Stanford Linear Accelerator Center, Menlo Park, CA, USA (Jun 2019 to Aug 2019)

- SURF summer intern (Advisor: Dr. Raghvendra Sahai) (Jun 2018 to Aug 2018)

  NASA Jet Propulsion Laboratory, Pasadena, CA, USA

Awards and Honors

- UMD College of Computer, Mathematical, and Natural Sciences Dean's Fellow (June 2022)

  – Dean's Fellowships are awarded to outstanding students to support their research and progress toward degree, to cover one semester of full stipend support in order to allow students the freedom to focus fully on their research.

- Completion of GROWTH Summer School (Aug 2020)

  – Earned a certificate of completion after finishing the GROWTH Summer School, a workshop that teaches skills and techniques for multiwavelength follow-up of transient astronomical sources.

- Caltech Housner Fund Recipient (December 2019)

  – Successful proposal accepted by the Undergraduate Deans to receive funding for travel to an international conference (30th Texas Symposium For Relativistic Astrophysics in Porstmouth, United Kingdom) to present research.

Mentoring Experience

- Creator of Mentoring Program between Senior Undergraduate and Graduate Students (*UMD College Park Department of Astronomy*) – Began the Astronomy Department's first mentoring program between senior undergraduate and graduate students, for the purposes of guiding seniors through both the graduate school admissions process and helping with career advice if they choose not to apply to graduate school. The program is offered yearly now. (Sep 2022 to Present)
- Senior undergraduate student Muhammad Mousa (*NASA Goddard*) – Research mentor for summer student through CRESST NASA Goddard Summer Internship Program. Will continue to mentor Muhammad through his senior thesis. Working on a single-object paper on a nearby Type Ic-BL SN. (June 2024 to Present)
- Senior undergraduate student Rohan Kane (*UMD College Park*) – Mentored Rohan through the graduate school application process. (Sep 2022 to May 2023)
- Junior undergraduate Student Rodney Speights (*San Diego State University*) – Mentored Rodney since he was a HS Junior, guiding him through the undergrad admissions process, independently teaching him astronomy concepts, and guiding him through summer REU applications. (Jun 2020 to Present)

Teaching Experience

- Teaching Assistant for Intro to Astronomy (ASTR 101) – Prof. Eliza Kempton (Aug 2021 to Dec 2021)
- Taught an independent astronomy and Python course to two high school students (Aug 2021 to Dec 2021)

Outreach and DEI Initiatives

- Co-creator of Cosmos Crusaders Podcast (Apr 2022 to March 2023)

  – The podcast highlights the stories of minorities and underrepresented individuals in astrophysics, and features guests ranging from graduate students to tenured Professors.
- Student Leader (1 of 4) for the Cosmic Explorers Science Interest Group (Apr 2022 to Present)

  – The program addresses the needs of students in astrophysics and space science, based on analyses of the Astro2020 decadal survey, NASA's strategic plans, the AIP Team-Up report, and the White House OSTP Interagency Roadmap to Support Space-Related STEM Education and Workforce. The student-focused science interest group is a conduit between undergraduate and graduate students and the activities of NASA Astrophysics and the Cosmic Origins/Physics of the Cosmos program offices.
- Active Member of Equity, Diversity, and Inclusivity Commitee of the University of Maryland Astronomy Department (Aug 2021 to Present)

Technical Skills

Observing experience

- Lowell Disocvery Telescope: Large Monolithic Imager, DeVeny Spectograph
- Palomar 200": Wide Field Infrared Camera (WIRC)
- NASA Infrared Telescope Facility: SpeX

Coding Experience: Python, HTML, GitHub, MATLAB, C, LaTeX

Data reduction experience: *Swift* UVOT and XRT, NIR and optical images, Fermi-LAT

Telescope Proposals

PI

- ToO Observations of Relativistic Transients From the Zwicky Transient Facility (Lowell Discovery Telescope, 17 hours)
- *Swift ToOs* ($>$ 20 accepted)

Co-I

- A Search for SNe Ic-BL with X-Ray Afterglows Using ZTF+*Swift* (*Swift*, 60 ks)
- uGMRT Observations of AT2023sva - Orphan Afterglow of a Relativistic Cosmic Explosion (uGMRT, 12 hours)

Talks (20 Total, 5 Invited)

20. *The Diversity of Massive Stellar Deaths and Relativistic Jets: Unraveling a Cosmic Tandem*
Invited Talk at Caltech IPAC Science Talk – *California Institute of Technology, Pasadena, CA* (November 2024)

19. *The Diversity of Massive Stellar Deaths and Relativistic Jets: Unraveling a Cosmic Tandem*
Talk at UCLA Tuesday Lunch – *Unviersity of Los Angeles, California , Los Angeles, CA* (November 2024)

18. *The Diversity of Massive Stellar Deaths and Relativistic Jets: Unraveling a Cosmic Tandem*
Invited talk at UWM Center for Gravitation, Cosmology & Astrophysics Seminar – *University of Wisconsin Madison, Madison, WI* (October 2024)

17. *Optical and Radio Analysis of Systemically Classified Broad-lined Type Ic Supernovae from the Zwicky Transient Facility*
Talk at Cornell Astrophysics Lunch – *Cornell Unviersity, Ithaca, NY* (September 2024)

16. *GRB 221009A/SN 2022xiw and GRB 230812B/SN 2023pel – Two Ordinary SNe associated with Energetic GRBs*
Talk at Rise_Time Conference – *Purdue University, West Lafayette, IL* (August 2024)

15. *GRB 221009A/SN 2022xiw and GRB 230812B/SN 2023pel – Two Ordinary SNe associated with Energetic GRBs*
Talk at Northwestern Observational Astronomy Meeting – *Northwestern Unviersity, Evanston, IL* (Feb 2024)

14. *GRB 221009A/SN 2022xiw and GRB 230812B/SN 2023pel – Two Ordinary SNe associated with Energetic GRBs*
Invited Talk for Monday Afternoon Talk at MIT – *Massachusetts Institute of Technology, Cambridge, MA* (Nov 2023)

13. *GRB 221009A/SN 2022xiw and GRB 230812B/SN 2023pel – Two Ordinary SNe associated with Energetic GRBs*
Invited Talk at LDT Partners Meeting – *Virtual* (Nov 2023)

12. *GRB 221009A/SN 2022xiw and GRB 230812B/SN 2023pel – Two Ordinary SNe associated with Energetic GRBs*
Invited Talk at ZTF biannual meeting – *California Institute of Technology, Pasadena CA* (Oct 2023)

11. *A Sensitive Search for Supernova Emission Associated with the Extremely Energetic and Nearby GRB 221009A*
Contributed Talk at GRB 50: The Past, Present, and Future of Gamma-Ray Bursts – *Warrenton, VA* (Aug 2023)

10. *SN 2020qmp: A Type IIP Supernova at 15.6 Mpc discovered by PGIR*
Contributed Talk at Palomar Science Meeting – *Pasadena, CA* (June 2023)

9. *A Sensitive Search for Supernova Emission Associated with the Extremely Energetic and Nearby GRB 221009A*
   Caltech Cahill Seminar – *Pasadena, CA* (June 2023)

8. *A Study of Broad-Lined Type Ic Supernoave from the Zwicky Transient Facility*
   Contributed Poster at 20th meeting of the AAS High Energy Astrophysics Division – *Waikola Village, HI* (Mar 2023)

7. *SN 2020qmp: A Type IIP Supernova at 15.6 Mpc discovered by PGIR*
   Contributed Talk at 240th meeting of the AAS– *Pasadena, CA* (Jun 2022)

6. *A Search for Relativistic Explosions in a Sample of ZTF Ic-BL Supernovae*
   Contributed Poster at 19th meeting of the AAS High Energy Astrophysics Division – *Pittsburgh, PA* (Mar 2022)

5. *On the investigation of the closure relations for GRBs observed by Swift in the post-plateau phase and the GRB fundamental plane*
   Contributed iPoster Plus Presentation at 237th meeting of the AAS – *virtual* (Jan 2020)

4. *On the Existence of the Plateau Emission in High-Energy Gamma-Ray Burst Light Curves observed by Fermi-LAT*
   Seminar SLAC Summer Intern Talk – *virtual* (Aug 2020)

3. *Investigation of possible existence of the plateau emission of Gamma-Ray Burst Light Curves observed by the FERMI-LAT and the fundamental plane relation with FERMI-LAT*
   Contributed Poster at Texas Symposium for Relativistic Astrophysics – *Portsmouth, United Kingdom* (Dec 2019)

2. *Study of Plateau Emission of Gamma-Ray Bursts in High-Energy Gamma-Rays and X-rays*
   SLAC Summer Intern Talk – *Stanford Linear Accelerator Center, Menlo Park, CA* (Aug 2019)

1. *Least Squares Fitting of the Spectral Energy Distributions of 30,000 Mass-Losing Stars using a Million Model Library: A Dictionary-Based Python Code*
   SURF Summer Intern Talk *NASA Jet Propulsion Lab, Pasadena, CA* (Jun 2018)

Publications (14 Total, 4 First Author)

NASA ADS Library

Lead

[1] **Srinivasaragavan**, G. P. et al. "Characterizing the Ordinary Broad-line Type Ic SN 2023pel from the Energetic GRB 230812B". In: 960.2, L18 (Jan. 2024), p. L18. DOI: 10.3847/2041-8213/ad16e7. arXiv: 2310.14397 [astro-ph.HE].

[2] **Srinivasaragavan, G.P.** et al. "A Sensitive Search for Supernova Emission Associated with the Extremely Energetic and Nearby GRB 221009A". In: 949.2, L39 (June 2023), p. L39. DOI: 10.3847/2041-8213/accf97. arXiv: 2303.12849 [astro-ph.HE].

[3] **Srinivasaragavan, G.P.** et al. "PGIR 20eid (SN 2020qmp): A Type IIP Supernova at 15.6 Mpc discovered by the Palomar Gattini-IR survey". In: 660, A138 (Apr. 2022), A138. DOI: 10.1051/0004-6361/202142158. arXiv: 2109.02159 [astro-ph.HE].

[4] **Srinivasaragavan, G.P.**, M. G. Dainotti, N. Fraija, X. Hernandez, S. Nagataki, A. Lenart, L. Bowden, and R. Wagner. "On the Investigation of the Closure Relations for Gamma-Ray Bursts Observed by Swift in the Post-plateau Phase and the GRB Fundamental Plane". In: 903.1, 18 (Nov. 2020), p. 18. DOI: 10.3847/1538-4357/abb702. arXiv: 2009.06740 [astro-ph.HE].

Significant Contribution

[5] A. Corsi, A. Y. Q. Ho, S. B. Cenko, S. R. Kulkarni, S. Anand, S. Yang, J. Sollerman, **Srinivasaragavan, G.P.**, et al. "A search for relativistic ejecta in a sample of ZTF broad-lined Type Ic supernovae". In: *arXiv e-prints*, arXiv:2210.09536 (Oct. 2022), arXiv:2210.09536. arXiv: 2210.09536 [astro-ph.HE].

[6] M. G. Dainotti, N. Omodei, **Srinivasaragavan, G. P.**, et al. "On the Existence of the Plateau Emission in High-energy Gamma-Ray Burst Light Curves Observed by Fermi-LAT". In: 255.1, 13 (July 2021), p. 13. DOI: 10.3847/1538-4365/abfe17. arXiv: 2105.07357 [astro-ph.HE].

[7] K. De, M. C. B. Ashley, I. Andreoni, M. M. Kasliwal, R. Soria, **Srinivasaragavan, Gokul P.**, et al. "Constraining the X-Ray-Infrared Spectral Index of Second-timescale Flares from SGR 1935+2154 with Palomar Gattini-IR". In: 901.1, L7 (Sept. 2020), p. L7. DOI: 10.3847/2041-8213/abb3c5. arXiv: 2007.02978 [astro-ph.HE].

Other Contribution

[8] B. O'Connor et al. "A structured jet explains the extreme GRB 221009A". In: *Science Advances* 9.23, eadi1405 (June 2023), eadi1405. DOI: 10.1126/sciadv.adi1405. arXiv: 2302.07906 [astro-ph.HE].

[9] K. De et al. "SRGA J181414.6-225604: A New Galactic Symbiotic X-Ray Binary Outburst Triggered by an Intense Mass-loss Episode of a Heavily Obscured Mira Variable". In: 935.1, 36 (Aug. 2022), p. 36. DOI: 10.3847/1538-4357/ac7c6e. arXiv: 2205.09139 [astro-ph.HE].

[10] M. G. Dainotti, A. Ł. Lenart, N. Fraija, S. Nagataki, D. C. Warren, B. De Simone, G. Srinivasaragavan, and A. Mata. "Closure relations during the plateau emission of Swift GRBs and the fundamental plane". In: 73.4 (Aug. 2021), pp. 970–1000. DOI: 10.1093/pasj/psab057. arXiv: 2105.10717 [astro-ph.HE].

[11] K. De et al. "A Population of Heavily Reddened, Optically Missed Novae from Palomar Gattini-IR: Constraints on the Galactic Nova Rate". In: 912.1, 19 (May 2021), p. 19. DOI: 10.3847/1538-4357/abeb75. arXiv: 2101.04045 [astro-ph.HE].

Preprints and not peer-reviewed

[12] S. Anand et al. "Collapsars as Sites of r-process Nucleosynthesis: Systematic Near-Infrared Follow-up of Type Ic-BL Supernovae". In: *arXiv e-prints*, arXiv:2302.09226 (Feb. 2023), arXiv:2302.09226. DOI: 10.48550/arXiv.2302.09226. arXiv: 2302.09226 [astro-ph.HE].

[13] K. K. Das et al. "Probing pre-supernova mass loss in double-peaked Type Ibc supernovae from the Zwicky Transient Facility". In: *arXiv e-prints*, arXiv:2306.04698 (June 2023), arXiv:2306.04698. DOI: 10.48550/arXiv.2306.04698. arXiv: 2306.04698 [astro-ph.HE].

[14] K. Y. Hansen et al. "Second Timescale Photometry of the Very Fast Nova V1674 Her with Palomar Gattini-IR". In: *Research Notes of the American Astronomical Society* 5.10, 244 (Oct. 2021), p. 244. DOI: 10.3847/2515-5172/ac3256. arXiv: 2110.13253 [astro-ph.HE].

Last updated: August 14, 2024