Rahul Jayaraman

Massachusetts Institute of Technology
37-624(b), 77 Massachusetts Avenue
Cambridge, MA, 02139

E-mail: rjayaram@mit.edu
ORCID: 0000-0002-7778-3117
Phone: +1 (408) 666-6323

Education

Massachusetts Institute of Technology, Cambridge, MA — Aug 2019 - May 2025 (Expected)
PhD Candidate in Physics (GPA: 5.0/5.0)
Thesis Advisor: Dr. George Ricker

Brown University, Providence, RI — Sep 2015 - May 2019
Sc.B. Physics (Honors) & A.B. Comp. Sci., *magna cum laude* (GPA: 3.94/4.0)
Honors Thesis: Phase Curve Analyses of Exoplanet Atmospheres
Advisor: Professor Gregory Tucker

Other Professional Experience

Astrophysics Mission Design School, JPL (Pasadena, CA) — Jan 2023 - Apr 2023

Software Engineering Intern, TripAdvisor (Needham, MA) — Jun 2018 - Aug 2018

Full-Stack Web Developer Intern, Adobe (San Francisco, CA) — May 2017 - Aug 2017

Application Development Intern, ServiceNow (Santa Clara, CA) — May 2016 - Aug 2016

Publications (ADS library)

As first author

1. **Rahul Jayaraman**, Saul Rappaport, Brian Powell, Gerald Handler, et al. TIC 435850195: The Second Tri-Axial Pulsator. (submitted to ApJ; draft available upon request)
2. **Rahul Jayaraman**, Michael Fausnaugh, George R. Ricker, and Roland Vanderspek. Gamma-Ray Bursts Observed by the Transiting Exoplanet Survey Satellite: Prompt Optical Counterparts and Afterglows of Swift-XRT Localized GRBs. *arXiv e-prints (2308:05148)*, August 2023 (accepted ApJ)
3. **Rahul Jayaraman**, Saul A. Rappaport, Lorne Nelson, Donald W. Kurtz, George Dufresne, Gerald Handler, Abdel Senhadji, David W. Latham, George Zhou, Allyson Bieryla, and George R. Ricker. TIC 5724661: A Long-period Binary with a Pulsating sdB Star and δ Scuti Variable. *The Astrophysical Journal*, 936(2):123, September 2022
4. **Rahul Jayaraman**, Gerald Handler, Saul A. Rappaport, Jim Fuller, Donald W. Kurtz, Stéphane Charpinet, and George R. Ricker. Tidally Tilted Pulsations in HD 265435, a Subdwarf B Star with a Close White Dwarf Companion. *The Astrophysical Journal Letters*, 928(2):L14, April 2022
5. **Rahul Jayaraman**, Swetlana Hubrig, Daniel L. Holdsworth, Markus Schöller, Silva Järvinen, Donald W. Kurtz, Robert Gagliano, and George R. Ricker. Could the Magnetic Star HD 135348 Possess a Rigidly Rotating Magnetosphere? *The Astrophysical Journal Letters*, 924(1):L10, January 2022

As major contributing author

1. F. Kahraman Aliçavuş, G. Handler, S. Chowdhury, E. Niemczura, **R. Jayaraman**, P. De Cat, D. Ozuyar, and F. Aliçavuş. On the Existence of "Maia variables". *arXiv e-prints*, page arXiv:2404.16988, April 2024 (accepted to PASA)

2. Valencia Zhang, Saul Rappaport, **Rahul Jayaraman**, Donald W. Kurtz, Gerald Handler, James Fuller, and Tamas Borkovits. TIC 184 743 498: the first tri-axial stellar pulsator. *Monthly Notices of the Royal Astronomical Society*, 528(2):3378–3391, February 2024

3. Veselin B. Kostov, Brian P. Powell, Saul A. Rappaport, Tamás Borkovits, Robert Gagliano, Thomas L. Jacobs, **Rahul Jayaraman**, Martti H. Kristiansen, et al. 101 eclipsing quadruple star candidates discovered in TESS full frame images. *Monthly Notices of the Royal Astronomical Society*, 527(2):3995–4017, January 2024

4. Luke G. Bouma, **Rahul Jayaraman**, Saul Rappaport, Luisa M. Rebull, Lynne A. Hillenbrand, Joshua N. Winn, et al. Transient Corotating Clumps around Adolescent Low-mass Stars from Four Years of TESS. *The Astronomical Journal*, 167(1):38, January 2024

5. Theodor Pribulla, Tamás Borkovits, **Rahul Jayaraman**, Saul Rappaport, Tibor Mitnyan, Petr Zasche, et al. BU Canis Minoris - the most compact known flat doubly eclipsing quadruple system. *Monthly Notices of the Royal Astronomical Society*, 524(3):4220–4238, September 2023

6. Silva P. Järvinen, Swetlana Hubrig, **Rahul Jayaraman**, Aleksandar Cikota, and Markus Schöller. The magnetic, spectroscopic, and photometric variability of the Wolf-Rayet star WR 55. *Monthly Notices of the Royal Astronomical Society*, 524(1):L21–L25, September 2023

7. Donald W. Kurtz, **Rahul Jayaraman**, Paulina Sowicka, Gerald Handler, Hideyuki Saio, Jonathan Labadie-Bartz, and Umin Lee. HD 42477: coupled r modes, g modes, and a p mode in an A0Vnne star. *Monthly Notices of the Royal Astronomical Society*, 521(3):4765–4774, May 2023

8. Geoffrey Mo, **Rahul Jayaraman**, Michael Fausnaugh, Erik Katsavounidis, George R. Ricker, and Roland Vanderspek. Searching for Gravitational-wave Counterparts Using the Transiting Exoplanet Survey Satellite. *The Astrophysical Journal Letters*, 948(1):L3, May 2023

9. P. Zasche, T. Borkovits, **R. Jayaraman**, S. A. Rappaport, M. Brož, D. Vokrouhlický, I. B. Bíró, T. Hegedüs, Z. T. Kiss, R. Uhlař, et al. V994 Herculis: a unique triply eclipsing sextuple star system. *Monthly Notices of the Royal Astronomical Society*, 520(2):3127–3142, April 2023

10. S. P. Järvinen, S. Hubrig, **R. Jayaraman**, I. Ilyin, and M. Schöller. Magnetic field measurements of sharp-lined Ap stars. *Monthly Notices of the Royal Astronomical Society*, 516(2):2629–2640, October 2022

As minor contributing author (selected)

1. S. A. Rappaport, T. Borkovits, T. Mitnyan, R. Gagliano, N. Eisner, T. Jacobs, A. Tokovinin, B. Powell, V. Kostov, M. Omohundro, M. H. Kristiansen, **R. Jayaraman**, et al. Seven new triply eclipsing triple star systems. *arXiv e-prints*, page arXiv:2403.12041, March 2024

2. D. L. Holdsworth, M. S. Cunha, M. Lares-Martiz, D. W. Kurtz, V. Antoci, S. Barceló Forteza, P. De Cat, A. Derekas, C. Kayhan, D. Ozuyar, et al. (including **R. Jayaraman**) TESS Cycle 2 observations of roAp stars with 2-min cadence data. *Monthly Notices of the Royal Astronomical Society*, 527(4):9548–9580, February 2024

3. Daniel A. Perley, Anna Y. Q. Ho, Michael Fausnaugh, Gavin P. Lamb, Mansi M. Kasliwal, Tomas Ahumada, Shreya Anand, Igor Andreoni, Eric Bellm, et al. (including **Rahul Jayaraman**) AT2019pim: A Luminous Orphan Afterglow from a Moderately Relativistic Outflow. *arXiv e-prints*, January 2024

4. M. M. Fausnaugh, P. J. Vallely, M. A. Tucker, C. S. Kochanek, B. J. Shappee, K. Z. Stanek, George R. Ricker, Roland Vanderspek, Manan Agarwal, Tansu Daylan, **Rahul Jayaraman**, Rebekah Hounsell, and Daniel Muthukrishna. Four Years of Type Ia Supernovae Observed by TESS: Early-time Light-curve Shapes and Constraints on Companion Interaction Models. *The Astrophysical Journal*, 956(2):108, October 2023

5. J. Greiner, C. Maitra, F. Haberl, R. Willer, J. M. Burgess, N. Langer, J. Bodensteiner, D. A. H. Buckley, I. M. Monageng, A. Udalski, H. Ritter, K. Werner, P. Maggi, **R. Jayaraman**, and R. Vanderspek. A helium-burning white dwarf binary as a supersoft X-ray source. *Nature*, 615(7953):605–609, March 2023

6. Brian P. Powell, Veselin B. Kostov, Saul A. Rappaport, Tamás Borkovits, Petr Zasche, Andrei Tokovinin, Ethan Kruse, David W. Latham, Benjamin T. Montet, Eric L. N. Jensen, **Rahul Jayaraman**, Karen A. Collins, et al. TIC 168789840: A Sextuply Eclipsing Sextuple Star System. *The Astronomical Journal*, 161(4):162, April 2021

Non peer-reviewed publications and conference proceedings

1. Geoffrey Mo, **Rahul Jayaraman**, Danielle Frostig, Michael M. Fausnaugh, Erik Katsavounidis, and George R. Ricker. Multi-messenger astrophysics in the gravitational-wave era. *arXiv e-prints*, page arXiv:2311.10229, November 2023

2. Michael M. Fausnaugh, **Rahul Jayaraman**, Roland Vanderspek, George R. Ricker, Christopher J. Burke, Knicole D. Colón, et al. Observations of GRB 230307A by TESS. *Research Notes of the American Astronomical Society*, 7(3):56, March 2023

3. Gerald Handler, **Rahul Jayaraman**, Donald W. Kurtz, Jim Fuller, and Saul A. Rappaport. Tidally Tilted Pulsators. In *Polish Astronomical Society Meeting*, volume 12, pages 183–186, October 2022

4. **Rahul Jayaraman**, Donald W. Kurtz, Gerald Handler, Saul Rappaport, and George Ricker. Two New roAp Stars Discovered with TESS. *Research Notes of the American Astronomical Society*, 5(11):268, November 2021

Lead author or co-author on 4 GCN Notices (# 33453, 33878, 34650, 35047)

Presentations

Conferences

- **Talk**: Prompt Optical Emission from Gamma-ray Bursts Identified with TESS, *Rise_Time* (Aug '24, Purdue University, IN)
- **Talk**: TESS as a Multi-Messenger Observatory, *TESS Science Conference 3* (Jul '24, Boston, MA)
- **Talk**: Characterizing Gamma-ray Bursts with TESS, *TESS Science Conf. 3* (Jul '24, Boston, MA)
- **Talk**: Studying Gamma-ray Bursts and Gravitational-Wave events with TESS, *Transients Down Under* (Jan '24, Melbourne, Australia).
- **Talk**: Studying Gamma-ray Bursts with TESS, AAS 243 Meeting (Jan '24, New Orleans, LA).

- **Talk**: Tidally Tilted Pulsations: A Novel Window into Asteroseismic Inference. TASC6/KASC13 Workshop (Jul '22, Leuven, Belgium).
- **Talk**: Tidally Tilted Pulsations in HD 265435, AAS 240 (Jun '22, Pasadena, CA).
- **Poster**: BU CMi: The Tighest-Known Flat Quadruple System, TSC II (Aug '21, virtual).
- **Talk**: TESS: The Transient (Extragalactic) Survey Satellite, AAS 237 (Jan '21, virtual).
- **Talk**: Transient Detection in FFIs Using ML, AAS 237 Special Session (Jan '21, virtual).
- **Poster**: Using TESS Full-Frame Images to Detect Transients, AAS 235 (Jan '20, Honolulu, HI).
- **Poster**: The Phase Curve of the Hot Jupiter WASP-79b. Rhode Island Space Grant Symposium (Apr '19, Bristol, RI).
- **Poster**: Identification of Exoplanetary Targets for the James Webb Space Telescope, ERES IV (Jun '18, State College, PA).

Small-format and Seminar

- Transient Science @ Space Telescope Group Meeting, STScI, Apr 2024
- Gamma-ray Burst Lunch, NASA/Goddard, Apr 2024
- ULTRASAT Gamma-ray Burst Working Group, virtual, Dec 2023
- Harvard ITC Luncheon Seminar, Oct 2023
- The Transient Universe Workshop (Corsica), Jun 2023
- Guest Lecture, PSYC 201, UMass Boston, Apr 2023
- TESS Science Update Meeting, virtual, Nov 2020

Awards, Grants, and Fellowships

MIT Physics Department, Graduate Service Award	Jun 2021
NSF Graduate Reseach Fellowship Program, Honorable Mention	Mar 2021
Rhode Island Space Grant, Academic Year Scholarship	May 2018
Rhode Island Space Grant, Summer Fellowship (*declined*)	Mar 2017
Karen T. Romer Undergraduate Teaching & Research Award, Summer (*declined*)	Mar 2017
National Merit Scholarship	Mar 2015

Mentoring Experience

Michelle Xiang, MIT '26 (MIT UROP; co-supervised with Jeroen Audenaert)	May 2023 - present
Valencia Zhang (Andover Academy; co-supervised with Prof. Saul Rappaport)	Mar 2023 - present
Mohammad Abdullah, MIT '24 (MIT UROP; co-supervised with Prof. Michael Fausnaugh)	Jun 2021 - Jan 2022

Proposals and Observing Experience

As PI

Magellan 6.5-m (IMACS): Identifying the Host Galaxy of GRB 230903A (0.5 nights)	2024A
LCO 2-m (FLOYDS): Follow-up for Transients Detected with TESS (1 night)	2022B
TESS G05108: Using TESS to Study Tidally Tilted Pulsators	Aug 2022
TESS DDT Proposal 60: Tidally Tilted Pulsators in Cycle 4	Apr 2022
TESS DDT Proposal 53: Short-Cadence Observations of Hot OBA Stars	Dec 2021
TESS DDT Proposal 39: TIC 5724661, a Unique sdB Binary	Jul 2021
TESS G04168: Complex Modulations in Rapidly Rotating M Dwarfs	Apr 2021

As co-I (selected)

ESO 111.24L8/112.25MH: Measuring magnetic fields of candidate magnetospheric stars	2023-2024
ESO 111.24JY: Understanding the influence of lower metallicity on stellar magnetism	2023
TESS G06123: Exploiting The Scientific Potential Of Tidally Tilted Pulsators	Aug 2023
SALT: Observations of Magnetospheric Stars	Jan 2022
SALT DDT: Observations of RRM star HD 135348	Aug 2021

Teaching Experience

Academic Mentor, MIT 8.012: Classical Mechanics	Sep 2023 - Dec 2023
	Sep 2020 - Dec 2020
Academic Mentor, MIT 8.03: Waves and Oscillations	Feb 2021 - Jun 2021
Physics Group Tutoring Coordinator, Brown Dean of the College Office	Sep 2017 - May 2019
Undergraduate TA, Brown Department of Computer Science	Aug 2016 - Dec 2016

Selected Outreach and Service

Proposal Referee, Canada-France-Hawaii Telescope
Referee, *Astronomy & Astrophysics*
LOC Member, TESS Science Conferences 2–3

Bargaining Committee Member, MIT Graduate Student Union	Jul 2022 - Sep 2023
Graduate Representative, MIT Physics Graduate Admissions Committee	Aug 2020 - Jul 2022
Graduate Representative, MIT Physics Values Working Group	Sep 2020 - Jun 2022
President, MIT Physics Graduate Student Council	Jul 2021 - Jun 2022
Diversity, Equity, and Inclusion Fellow, MIT Graduate Student Council	Jan 2021 - Dec 2021
Small Group Mentor, Warrior-Scholar Project	Jul 2021
Graduate Representative, MIT Kavli Institute Anti-Racism Task Force	Jun 2020 - Aug 2020
Volunteer Director & Astronomy Contest Lead, Brown Science Olympiad	Sep 2017 - Mar 2019

Press

Research Updates from TESS, **MIT News Office** (link) Feb 10, 2021

Miscellany

Professional Affiliations: American Astronomical Society

Programming Skills: Python, Java, C, JavaScript, HTML/CSS, Mathematica, IDL, R, Scala

Languages: English, Spanish, Tamil, Hindi (limited proficiency)