Rahul Jayaraman

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Education

Massachusetts Institute of Technology, Cambridge, MA — Aug 2019 - May 2025 (Expected)
PhD Candidate in Physics (GPA: 5.0/5.0)
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)
Thesis: Phase Curve Analyses of Exoplanet Atmospheres
Advisor: Professor Gregory Tucker

Professional Experience

Graduate Research Assistant, Massachusetts Institute of Technology — Sep 2019 - Present

- Developing a pipeline to identify transients in the field-of-view of the Transiting Exoplanet Survey Satellite (*TESS*) with machine learning
- Significant projects using TESS to study the following: (1) asteroseismology of A/F-type and compact stars, (2) magnetic fields in massive stars, and (3) multiple star systems

Undergraduate Research Assistant, Brown University — Oct 2016 - May 2019

- Helped refine a Python pipeline to extract and fit phase curves from the Spitzer Space Telescope for hot Jupiters to identify targets for the JWST Early Release Science Program
- Wrote a thesis analyzing WASP-121 b and its atmosphere

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

- Led development of a key new feature allowing restaurant owners to pause ad campaigns

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

- Implemented a real-time in-house analytics API for the Contributor and Stock websites

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

- Developed a new feature to help users navigate the Customer Service Management product

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Publications (ADS library)

As first author

1. **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

2. **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

3. **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

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

As major contributing author

1. Geoffrey Mo, **Rahul Jayaraman**, Michael Fausnaugh, and ... Searching for Gravitational-Wave Counterparts using the Transiting Exoplanet Survey Satellite. *arXiv e-prints*, page arXiv:2302.04881, February 2023

2. Petr Zasche, Tamas Borkovits, **Rahul Jayaraman**, and ... V994 Herculis: a unique triply eclipsing sextuple star system. *MNRAS*, 520(2):3127–3142, April 2023

3. Brian P. Powell, Saul A. Rappaport, Tamás Borkovits, ..., **Rahul Jayaraman**, and ... TIC 114936199: A Quadruple Star System with a 12 Day Outer-orbit Eclipse. *ApJ*, 938(2):133, October 2022

4. Silva Järvinen, Swetlana Hubrig, **Rahul Jayaraman**, Ilya Ilyin, and Markus Schöller. Magnetic field measurements of sharp-lined Ap stars. *MNRAS*, 516(2):2629–2640, October 2022

5. Gerald Handler, **Rahul Jayaraman**, Donald W. Kurtz, Jim Fuller, and Saul A. Rappaport. Tidally Tilted Pulsators. In *Proceedings of the 40th Polish Astronomical Society Meeting*, volume 12, pages 183–186, October 2022

As minor contributing author

1. Colin Littlefield, D. W. Hoard, Peter Garnavich, and ... **Rahul Jayaraman**. Kepler K2 and TESS Observations of Two Magnetic Cataclysmic Variables: The New Asynchronous Polar SDSS J084617.11+245344.1 and Paloma. *AJ*, 165(2):43, February 2023

2. Natalia M. Guerrero, S. Seager, Chelsea X. Huang, ... **Rahul Jayaraman**, and ... The TESS Objects of Interest Catalog from the TESS Prime Mission. *The Astrophysical Journal Supplement Series*, 254(2):39, June 2021

3. Brian P. Powell, Veselin B. Kostov, Saul A. Rappaport, ... **Rahul Jayaraman**, and ... TIC 168789840: A Sextuply Eclipsing Sextuple Star System. *The Astronomical Journal*, 161(4):162, April 2021

4. Maximilian Guenther, David Berardo, Elsa Ducrot, ... **Rahul Jayaraman**, and ... Complex Modulation of Rapidly Rotating Young M Dwarfs: Adding Pieces to the Puzzle. *Submitted for review, AAS Journals*, Aug 2020

5. Kristin S. Sotzen, Kevin B. Stevenson, David K. Sing, ..., **Rahul Jayaraman**, and ... Transmission Spectroscopy of WASP-79b from 0.6 to 5.0 μm. *The Astronomical Journal*, 159(1):5, Dec 2019

Presentations

1. **Talk**: Tidally Tilted Pulsations: A Novel Window into Asteroseismic Inference. Presented at the TASC6/KASC13 Workshop (July 2022, Leuven, Belgium).

2. **Talk**: Tidally Tilted Pulsators and the Case of HD 265435. Presented at the 240th Meeting of the American Astronomical Society (June 2022, Pasadena, CA).

3. **Poster**: BU Canis Minoris: The Tighest-Known Flat Quadruple System. Presented at the TESS Science Conference II (August 2021, virtual).

4. **Talk**: TESS: The Transient (Extragalactic) Survey Satellite. Presented at the 237th Meeting of the American Astronomical Society (January 2021, virtual).

5. **Talk**: Transient Detection in FFIs Using Machine Learning. Presented at a Special Session of the 237th Meeting of the American Astronomical Society (January 2021, virtual).

6. **Talk**: A Transient Detection Pipeline for TESS FFIs. Presented at the 23rd TESS Science Team Meeting (November 2020, virtual)

7. **Poster**: Using TESS Full-Frame Images to Detect Astrophysical Transients. Presented at the 235th Meeting of the American Astronomical Society (January 2020, Honolulu, HI).

8. **Poster**: Analysis of the Full Phase Curve of the Hot Jupiter WASP-79b. Presented at the Annual Rhode Island Space Grant Spring Symposium (April 2019, Bristol, RI).

9. **Poster**: Identification of Exoplanetary Targets for the James Webb Space Telescope. Presented at Emerging Researchers in Exoplanet Science IV (June 2018, State College, PA).

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

Mohammad Abdullah, MIT '24 (MIT UROP Program)	Jun 2021 - Jan 2022

Proposals and Observing Experience

As PI

LCO 2-m (FLOYDS): Follow-up for Transients Detected with TESS	2022B
TESS G05108: Using TESS to Study Tidally Tilted Pulsators	Aug 2022
TESS DDT Proposal: Short-Cadence Observations of Hot OBA Stars	Dec 2021
TESS DDT Proposal 39: TIC 5724661, a Cool sdB Binary	Jul 2021
TESS G04168: Complex Modulations in Rapidly Rotating M Dwarfs	Apr 2021

As co-I

TESS G05118: Testing X-ray Reprocessing In Mrk 359 with TESS, NICER, Swift	Aug 2022
SALT: Observations of Magnetospheric Stars	Jan 2022
SALT DDT: Observations of RRM star HD 135348	Aug 2021
TESS G04215: Characterizing AGN Variability and Quasi-Periodic Oscillations	Apr 2021

Teaching Experience

Academic Mentor, MIT 8.03: Waves and Oscillations	Feb 2021 - Jun 2021
Academic Mentor, MIT 8.012: Classical Mechanics	Sep 2020 - Dec 2020
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

Outreach, Service, and Other Experience

Proposal Referee, Canada-France-Hawaii Telescope

Referee, *Astronomy & Astrophysics*

Bargaining Committee Member, MIT Graduate Student Union	Jul 2022 - Present
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
Webmaster, MIT Graduate Student Council	Sep 2019 - Sep 2021
Website Lead, LOC, TESS Science Conference 2021	Dec 2020 - Aug 2021
Graduate Representative, MIT Kavli Institute Anti-Racism Task Force	Jun 2020 - Aug 2020
Director of Web Development, Brown Daily Herald	Mar 2018 - Sep 2019
Volunteer Director & Astronomy Contest Lead, Brown Science Olympiad	Sep 2017 - Mar 2019
Writer and Editor, Brown Triple Helix (and Blog)	Sep 2015 - May 2018

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)