

SUMAN SAHA

Postdoctoral Fellow

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Academic Training

Indian Institute of Astrophysics, Bengaluru, India

PhD in Astronomy & Astrophysics, July 2023

Thesis: Precise Transit Photometric Studies of Exoplanets and Exomoons

Supervisor: Prof. Sujan Sengupta

Pondicherry University, Puducherry, India

MSc in Physics, May 2017

Fakir Mohan University, Balasore, India

BSc in Physics (Hons.), May 2015

Research Interests

Transmission and emission spectroscopic characterization of ultra-hot Jupiters, Neptunian desert objects, and long-period cold giants

Rossiter-McLaughlin follow-up of long-period transiting exoplanets

Transit Timing Variation (TTV) follow-up of long-period transiting exoplanets

Photometric and radial velocity follow-up of long-period transiting exoplanet candidates

Detection and characterization of exomoons

Research Experience

Postdoctoral Fellow (ESO-Chile Comité Mixto, August 2023 – present)

Instituto de Estudios Astrofísicos, Universidad Diego Portales, Santiago, Chile

Postdoctoral Researcher (September 2022 – July 2023)

Indian Institute of Astrophysics, Bengaluru, India

PhD Candidate (July 2017 – September 2022)

Indian Institute of Astrophysics, Bengaluru, India

Masters Project (July 2016 – April 2017)

Pondicherry University, Puducherry, India

Summer Internship (May 2016 – July 2026)

Indian Institute of Astrophysics, Bengaluru, India

Observing Experience	<p>Gemini-South/GHOST – 8 hours (upcoming cycle, PI)</p> <p>SOuthern Astrophysical Research telescope (SOAR) – 9 nights (PI)</p> <p>CHaracterising ExOPlanet Satellite (CHEOPS) – 180 orbits (297 hours, Co-I)</p> <p>Himalayan Chandra Telescope (HCT) – more than 30 nights (PI)</p> <p>J.C. Bhattacharya Telescope (JCBT) – more than 40 nights (PI)</p>
Mentorship Experience	<p>Short-term project</p> <p>Devika KR, Bharata Mata College, India (January 2024 – present)</p> <p>Krishnapriya PR, Bharata Mata College, India (January 2024 – June 2024)</p> <p>Masters project</p> <p>Devika KR, Bharata Mata College, India (January 2023 – July 2023)</p> <p>Krishnapriya PR, Bharata Mata College, India (January 2023 – July 2023)</p>
Additional Experience	<p>Reviewer for proceedings of 3rd Belgo-Indian Network for Astronomy and Astrophysics (BINA) workshop (2023), Nainital, India</p> <p>Chief Editor (Feb 2021 – July 2022) and Senior Editor (May 2020 – July 2023), DOOT e-Magazine of Indian Institute of Astrophysics, India</p> <p>Student outreach coordinator (Sep 2018 – Mar 2020) and volunteer (2017 – 2023), Public Outreach Committee of Indian Institute of Astrophysics, India</p> <p>Student placement cell Coordinator (2015 - 2017), Placement cell of Department of Physics, Pondicherry University, India</p>
Awards and Honors	<p>ESO-Chile Comité Mixto Postdoctoral Fellowship (2 years, 2023 – present)</p> <p>Instituto de Estudios Astrofisicos, Universidad Diego Portales, Santiago, Chile</p> <p>Postdoctoral Research Fellowship (1 year, 2022 – 2023)</p> <p>Indian Institute of Astrophysics, Bengaluru, India</p> <p>Junior/Senior Research Fellowship (5 years, 2017 – 2022)</p> <p>Indian Institute of Astrophysics, Bengaluru, India</p> <p>Junior/Senior Research Fellowship (5 years, 2017, I declined)</p> <p>Council of Scientific & Industrial Research (CSIR) & University Grants Commission (UGC), India</p> <p>Summer student internship (2 months, 2016)</p> <p>Indian Institute of Astrophysics, Bengaluru, India</p> <p>Post-graduate scholarship for university rank holders (2 years, 2015 – 2017)</p> <p>University Grants Commission (UGC), India</p> <p>Gold medalist award for best graduate (2015)</p> <p>Fakir Mohan University, Balasore, India</p>

Talks and Presentations	December 2024: Contributed talk, Optical and near-IR planetary science in Chile, European Southern Observatory (ESO), Santiago, Chile
	July 2024: Seminar, Universidad Andrés Bello, Santiago, Chile
	May 2024: Contributed talk, Centro de Excelencia en Astrofísica y Tecnologías Afines (CATA) Area 6 workshop, Universidad Andrés Bello, Santiago, Chile
	March 2024: Contributed talk, Research jamboree at Instituto de Estudios Astrofísicos, Universidad Diego Portales, Santiago, Chile
	October 2023: Seminar, Universidad Diego Portales, Santiago, Chile
	July 2023: PhD defense public talk, Indian Institute of Astrophysics, Bengaluru, India
	March 2023: Contributed talk, 3rd Belgo-Indian Network for Astronomy and Astrophysics (BINA) workshop, Graphic Era Hill University, Nainital, India
	January 2023: Contributed talk, Indo-French CEFIPRA Astronomy Meeting (IFCAM)-III, Indian Institute of Astrophysics, Bengaluru, India
	April 2022: Pre-PhD synopsis talk, Indian Institute of Astrophysics, Bengaluru, India
	March 2022: Poster, 40th Annual Meeting of the Astronomical Society of India (ASI), Indian Institute Technology (IIT) Roorkee, Roorkee, India
	July 2021: Seminar, Indian Institute of Astrophysics, Bengaluru, India
	February 2020: Contributed talk, 38th Annual Meeting of the Astronomical Society of India (ASI), ISER Tirupati, Tirupati, India
	November 2019: Poster, 5th India International Science Festival (IISF), Kolkata, India
Nat/Int Networks	Next-Generation Transit Survey (NGTS, PI: Peter Wheatley)
	Sub-neptune Planetary Atmosphere Characterization Experiment (SPACE, an HST multi-cycle treasury program, PI: Laura Kreidberg)
	Center of Excellence in Astrophysics and Related Technologies (CATA – Area 6, PI: James Jenkins)
	Calan–Hertfordshire Extrasolar Planet Search (CHEPS, PI: James Jenkins)
	Tianyu project (PI: Fabo Feng)
	New Worlds Lab (PI: James Jenkins)

PUBLICATIONS

1st Authored (Refereed)

1. **S Saha**, JS Jenkins, et al., *CO, CO₂ and H₂O, but No SiO, in the Atmosphere of Extreme Ultra-Hot Jupiter WASP-178b As Revealed by JWST*, in preparation
2. **S Saha** and JS Jenkins, *A Highly Eccentric and Highly Inclined Sub-Earth Mass Companion to a Long-Period Jupiter Revealed by TTV*, in preparation
3. **S Saha**, JS Jenkins, et al., *Insight into the Atmospheric Composition of Extreme Ultra-Hot Jupiter WASP-121b by the Combined Analysis of Transmission and Emission Spectra from JWST*, in preparation
4. **S Saha**, JS Jenkins, V Parmentier and S Hoyer, *Constraining the Cloud Chemistry and Atmospheric Physics of LTT9779b Using CHEOPS Secondary Eclipse Measurements*, in preparation (close to submission)
5. **S Saha** and KR Devika, *Revisiting 33 Hot and Warm Jupiters With New TESS Sectors: Updated Physical Properties and Ephemeris*, in preparation (close to submission)
6. **S Saha**, *Updating the Ephemeris and Physical Properties of Five Long-period Transiting Exoplanets using TESS and CHEOPS*, submitted to The Astronomical Journal
7. **S Saha**, *Precise Transit Photometry Using TESS. II. Revisiting 28 Additional Transiting Systems with Updated Physical Properties*, The Astrophysical Journal Supplement Series (2024)
8. **S Saha**, *Precise Transit Photometry Using TESS: Updated Physical Properties for 28 Exoplanets around Bright Stars*, The Astrophysical Journal Supplement Series (2023)
9. **S Saha** and S Sengupta, *Transit Light Curves for Exomoons: Analytical Formalism*, The Astrophysical Journal (2022)
10. **S Saha** and S Sengupta, *Critical Analysis of TESS Transit Photometric Data: Improved Physical Properties for Five Exoplanets*, The Astronomical Journal (2021)
11. **S Saha**, A Chakrabarty and S Sengupta, *Multiband Transit Follow-up Observations of Five Hot Jupiters with Critical Noise Treatments: Improved Physical Properties*, The Astronomical Journal (2021)

Co-authored (Refereed)

1. S Ulmer-Moll, S Gill, R Brahm,..., **S Saha**, et al., *TOI-2449 b: a 106-Day Transiting Warm Jupiter Uncovered With NGTS and HARPS*, in preparation
2. Z Essack, D Dragomir, PA Dalba,..., **S Saha**, et al., *Giant Outer Transiting Exoplanet Mass (GOT `EM) Survey. VI: Confirmation of a Long-Period Giant Planet Discovered with a Single TESS Transit*, in preparation
3. S Gill, PJ Wheatley, D Bayliss, F Hawthorn, **S Saha**, *Detecting Transit Events in Photometric Datasets With Template Matching*, in preparation
4. A Kendall, S Ulmer-Moll, S Gill,..., **S Saha**, et al., *Three Long Period Planets from TESS*, in preparation
5. T Rodel, CA Watson, S Ulmer-Moll,..., **S Saha**, et al., *NGTS-EB-7, an Eccentric, Long-Period, Low-Mass Eclipsing Binary*, submitted to Monthly Notices of the Royal Astronomical Society

6. RI Rubenstein, JS Jenkins, PAR Peña,..., **S Saha**, et al., *Destruction of ‘Peas in a Pod.’ An Inner Gas Giant and Two Cool Super-Neptunes around the Nearby, Bright Star, HD208487*, submitted to *Astronomy & Astrophysics*
7. DR Anderson, JI Vines, K Hesse,..., **S Saha**, et al., *NGTS-11 c: a Neptune-Mass Planet in a Transiting 12.8-Day Orbit Interior to NGTS-11 b*, submitted to *The Astronomical Journal*
8. DR Alves, JS Jenkins, JI Vines,..., **S Saha**, et al., *NGTS-33b: A Young Super-Jupiter Hosted by a Fast Rotating Massive Hot Star*, *Monthly Notices of the Royal Astronomical Society* (2024)
9. JI Vines, JS Jenkins, DR Anderson,..., **S Saha**, et al., *NGTS-31b and NGTS-32b: Two Inflated hot Jupiters Orbiting Subgiant Stars*, *Monthly Notices of the Royal Astronomical Society* (2024)
10. BA Henderson, SL Casewell, A Jordán,..., **S Saha**, et al., *TOI-2490b—the Most Eccentric Brown Dwarf Transiting in the Brown Dwarf Desert*, *Monthly Notices of the Royal Astronomical Society* (2024)
11. MP Battley, KA Collins, S Ulmer-Moll,..., **S Saha**, et al., *NGTS-30b/TOI-4862b: An ~ 1 Gyr Old 98-Day Transiting Warm Jupiter*, *Astronomy & Astrophysics* (2024)
12. A Leleu, JB Delisle, L Delrez,..., **S Saha**, et al., *Photo-Dynamical Characterisation of the TOI-178 Resonant Chain*, *Astronomy & Astrophysics* (2024)
13. SM O’Brien, ME Schwamb, S Gill,..., **S Saha**, et al., *Planet Hunters NGTS: New Planet Candidates From a Citizen Science Search of the Next Generation Transit Survey Public Data*, *The Astronomical Journal* (2024)

Proceedings and White Papers

1. DM Kipping, MAS Martinez, M Sucerquia,..., **S Saha**, et al., *Exomoons: Their Scientific Potential, Urgent Need and JWST’s Unique Opportunity*, *Strategic Exoplanet Initiatives with HST and JWST* (2024)
2. **S Saha**, *Analytical Lightcurves for Transiting Exomoons*, *Bulletin de la Societe Royale des Sciences de Liege* (2024)