

# Rajeev Singh Rathour

GRADUATE RESEARCHER

Nicolaus Copernicus Astronomical Center (CAMK), Warsaw, Poland

✉ [rajeevsr@camk.edu.pl](mailto:rajeevsr@camk.edu.pl) |  Google Scholar |  ResearchGate |  ORCID

## Education

### Nicolaus Copernicus Astronomical Center (CAMK)

DOCTOR OF PHILOSOPHY, ASTROPHYSICS

• Advisor: **Dr. hab. Radosław Smolec**

Warsaw, Poland

Dec. 2019 - Mar. 2025 (Expected)

### Indian Institute of Science Education and Research (IISER), Pune

B.S.-M.S. INTEGRATED PROGRAMME (MAJOR IN PHYSICS; THESIS IN ASTRONOMY)

• Advisor: **Prof. Aruna Goswami**, Indian Institute of Astrophysics

Pune, India

2013 - 2018

## Research Interests

- Classical Pulsators (Cepheids & RR Lyrae)
- Stellar Evolution and Pulsation modeling-MESA code
- Variable stars in binary systems
- Asteroseismology
- Stellar nucleosynthesis

## Selected Publications

[NASA ADS link](#) [Google Scholar Citations 105; h-index 6]

†: Internal Review

- **Rajeev Singh Rathour**, Gergely Hajdu, Radosław Smolec, Paulina Karczmarek, Vincent Houdé, Oliwia Ziółkowska, Igor Soszyński, Andrzej Udalski  
*Non-evolutionary effects on period change in Magellanic Cepheids I. New binary systems revealed from Light Travel Time Effect*, *Astronomy & Astrophysics* DOI: [10.1051/0004-6361/202349117](https://doi.org/10.1051/0004-6361/202349117)
- †**Rajeev Singh Rathour**, Radosław Smolec, Gergely Hajdu, Vincent Houdé, Oliwia Ziółkowska, Igor Soszyński, Andrzej Udalski, Paulina Karczmarek  
*Non-evolutionary effects on Period change in Magellanic Cepheids II: First empirical constraints on non-linear period changes*
- **Rajeev Singh Rathour**, Radosław Smolec, Henryka Netzel.  
*Frequency analysis of OGLE-IV photometry for classical Cepheids in Galactic fields: non-radial modes and modulations*, *Monthly Notices of the Royal Astronomical Society*, Volume 505, Issue 4, 2021
- Oliwia Ziółkowska, Radosław Smolec, Anne Thoul, Eoin J. Farrell, **Rajeev Singh Rathour**, Vincent Houdé  
*Toward a comprehensive grid of Cepheid models with MESA I. Uncertainties of the evolutionary tracks of intermediate mass stars*.
- Jaroslav Merc, Csilla Kalup, **Rajeev Singh Rathour**, Julieta Paz Sánchez Aria, Paul G. Beck  
*Asteroseismology of the heartbeat star KIC 5006817* *Contributions of the Astronomical Observatory Skalnaté Pleso*, Volume. 51, no. 1, 2021
- Partha Pratim Goswami, **Rajeev Singh Rathour**, Aruna Goswami  
*Spectroscopic study of CEMP-(s & r/s) stars-Revisiting classification criteria and formation scenarios, highlighting i-process nucleosynthesis*, *Astronomy & Astrophysics*, Volume 649, 2021

## Awards & Recognition

2019-2024 **Doctoral Fellowship**, NCN SONATA BIS grant

2021 **Media coverage of CEMP star publication**, [\[1\]](#) [\[2\]](#) [\[3\]](#) [\[4\]](#)

2016 **Funded International internship**, Institut d'Astronomie et d'Astrophysique, Belgium

2018 **Best Masters Thesis score in Astronomy (9/10)**, IISER Pune

2013-2018 **INSPIRE Undergraduate Fellowship**, MHRD, Government of India

## Collaborations & Memberships

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2023-pres. **Wide-field Spectroscopic Telescope (WST)**, Galactic Team member

2022 - pres. **TESS Asteroseismic Science Consortium**, Working Group 5, 6 & 7

2018 **GMRT High-Resolution Southern Sky survey (GHRSS) collaboration**, External member

## Talks and Seminars

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Nov 2024 **RR Lyrae and Cepheid Stars Conference**, Contributed (Upcoming)  
Sep 2024 **KOPAL Conference (Binary and multiple Stars in the Era of Big Sky Surveys)**, Contributed  
July 2024 **8<sup>th</sup> TESS/15<sup>th</sup> Kepler Asteroseismic Science Consortium Workshop**, Contributed  
June 2024 **CAMK Toruń**, Seminar Talk  
Sept 2023 **41<sup>st</sup> Congress of the Polish Astronomical Society**, Contributed  
July 2023 **5<sup>th</sup> European Astronomical Society meeting**, Contributed  
June 2022 **Nicolaus Copernicus Astronomical Center, PAS**, Contributed  
Aug 2020 **GAIA & TESS Summer school**, Online  
June 2019 **X International Pulsar Timing Array (IPTA)**, Workshop

## Programs, Schools and Workshops

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July 2023 **Porto Summer School on Asteroseismology, From Pixels to Stellar Ages**, Porto, Portugal  
Sept 2023 **41<sup>st</sup> Congress of the Polish Astronomical Society**, Torun, Poland  
July 2023 **5<sup>th</sup> European Astronomical Society Meeting**, Krakow, Poland  
Sept 2022 **Stellar evolution along the HR diagram with GAIA**, Naples, Italy  
Sept 2022 **RRLyr and Cepheid stars Conference**, La Palma, Spain  
Aug 2022 **MESA Summer school**, California, US  
Sept 2021 **IMPRS Summer school on Stellar Ecosystems**, Heidelberg, Germany  
Sept 2021 **40<sup>th</sup> Congress of the Polish Astronomical Society**, Szczecin, Poland  
Sept 2020 **La Silla Paranal Users Workshop**, Online  
Aug 2020 **Exostar Redux - Online Reunion Conference**, California, US  
Aug 2020 **ERASMUS+ GAIA & TESS Summer school**, Brno, Czech Republic  
Aug 2020 **2020 Sagan Exoplanet Summer Virtual Workshop**, Caltech/IPAC-NExSci, California, US  
June 2019 **10<sup>th</sup> International Pulsar Timing Array (IPTA) Workshop**, Pune, India

## Skills

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- **Programming Languages:** *Python (Advanced), FORTRAN - 90 (Intermediate), Bash (Intermediate)*
- **Computing:** *Experience with computational cluster [Chuck](#)*
- **Softwares:** *MESA, Lightcurve, EMCEE, MultiNest, Period04, IRAF, MOOG, PRESTO, TEMPO2, AIPS, LaTeX*
- **Languages:** *Hindi and Jaunsari (Native), English (Fluent), Polish (Beginner), Marathi (Beginner), Bangla (Beginner)*

## Other Academic activities

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- Reviewer for A&A and JAAVSO articles.
- Supervised Ms. Zofia Piszczek (undergraduate student) under [Project 8: Summer student program 2023](#) at CAMK. Gave lectures and workshops covering stellar evolution, stellar pulsation, and MESA code basics.
- Observing experience: (i) 20 nights with 0.6-m WK and 0.8-m ZB telescope at Cerro Murphy Observatory (Chile); (ii) 30 nights with 2-m HCT telescope at the Indian Astronomical Observatory (IAO).
- LOC: (i) 10<sup>th</sup> International Pulsar Timing Array (IPTA) Workshop 2019; (ii) MODEST-2024 international conference.
- Founding member of Student Science Club at CAMK Warsaw