Jayshil A **Patel**

Doctoral Researcher

jayshil.github.io/ github.com/Jayshil
+46 761532483 @ jayshil.patel@astro.su.se
Department of Astronomy, Stockholm University, Stockholm, Sweden

I am a PhD student at Department of Astronomy at Stockholm University in Sweden. I mainly work on characterizing exoplanets and their atmospheres using various state of the art telescopes such as the James Webb Space Telescope (JWST), the CHaracterizing ExOPlanet Satellite (CHEOPS) and the Transiting Exoplanet Survey Satellite (TESS).

Academics

2021-	**Stockholm University, Sweden** Doctor of Philosophy in Astronomy Advisor : Dr. Alexis Brandeker, Co-Advisor : Dr. Markus Janson
2020-2021	**Université de Genève, Switzerland** Completed 65.5 ECTS (out of 120) towards Master's in Astrophysics.
2014-2019	**Sardar Vallabhbhai National Institute of Technology (SVNIT), Surat-7, Gujarat, India** Master of Science in Physics (*First Class with Distinction*) Thesis Advisor : Dr. Néstor Espinoza (then at **Max-Planck-Institut für Astronomie, Heidelberg, Germany**) Thesis title : "Study of the limb darkening effect using exoplanet transit light curves from TESS data"

Observing Time as PI

April 2023 to Present	**CHEOPS Guaranteed Time Observations** › Title : *Terminators* — Constraining morning and evening terminators of exoplanets › Telescope : CHaracterizing ExOPlanet Satellite (CHEOPS) › Total Observing Time : 214.3 orbits (∼ 353 hours).
June 2022 to Present	**CHEOPS Third Announcement of Opportunity (AO-3) Guest Observers Programme** › Title : *Constraining the morning and evening limbs of the hot jupiters WASP-79b and WASP-101b* › Telescope : CHaracterizing ExOPlanet Satellite (CHEOPS) › Total observing time : 159 orbits (∼ 261 hours).

Grants and Fellowships

C. F. Liljevalch Jr. Travel Grant — April 2023

I have been awarded 12000 SEK to attend *Extreme Solar Systems V* in Christchurch, New Zealand during March 2024.

Alva and Lennart Dahlmark Research Grants — October 2022

I have been awarded 15000 SEK to attend symposium on *Planetary Systems and the Origins of Life in the Era of JWST* at the Space Telescope Science Institute, Baltimore, USA during May 2023.

Indian Academy of Sciences Summer Fellowship — June 2018

I received Focus Area Science Technology Summer Fellowship (FAST-SF) from the Indian Academy of Sciences, Bengaluru to attend summer school and internship at Indian Institute of Astrophysics, Begaluru, India.

Software Packages

stark — February 2023

Lead/Contributing Developer | Link : github.com/Jayshil/stark
`stark` (Spectral exTraction And Reduction Kit) is a general purpose tool to reduce and extract spectrum from raw data, with a special focus on JWST data. The original concept and implementation was developed by Alexis Brandeker.

juliet — June 2022

Contributing Developer | Link : juliet.readthedocs.io
`juliet` is a versatile tool for modelling transiting and non-transiting exoplanetary systems. I contributed to this package to enhance its capabilities to analyse occultations and spectroscopic lightcurves.

PYCDATA NOVEMBER 2021

Lead Developer | Link : github.com/Jayshil/pycdata
A companion package of `pycheops` (a specialized tool to analyse CHEOPS data), useful in ingesting TESS, Kepler/K2 and PSF photometry from CHEOPS data in `pycheops`.

PHOENIX PIPELINE OCTOBER 2020

Lead Developer | Link : github.com/Jayshil/Phoenix_pipeline
A semi-automic data reduction and spectral extraction pipeline for Phoenix spectrograph at the Gemini Observatory.

PUBLICATIONS

First & Second Author Publications

1. **Patel, J. A.**, Egger, J. A., Wilson, T. G., et al., "CHEOPS View of the ultra-short period super-Earth TOI-561 b", (*submitted to A&A*)
2. Janson, M., **Patel, J. A.**, Ringqvist, S. C., et al., "Imaging of exocomets with infrared interferometry", 2023, A&A, 671, A114
3. **Patel, J. A.**, & Espinoza, N., "Empirical limb-darkening coefficients & transit parameters of known exoplanets from TESS", 2022, AJ, 163, 228

Other Contributions

1. Krenn, A. F., Lendl, M., **Patel, J. A.**, et al., "The geometric albedo of the hot Jupiter HD 189733 b measured with CHEOPS", 2023, A&A, 672, A24
2. Zakhozhay, O., Launhardt, R., Mueller, A., et al. (including **Patel, J. A.**), "RVSPY – Radial Velocity Survey for Planets around Young Stars. Target characterization and high-cadence survey", 2022, A&A, 667, A63
3. Demory, B. -O., Sulis, S., Meier Valdes, E., et al. (including **Patel, J. A.**), "55 Cancri e's occultation captured with CHEOPS", 2023, A&A, 669, A64
4. Zakhozhay, O., Launhardt, R., Trifonov, T., et al. (including **Patel, J. A.**), "RVSPY - Radial Velocity Survey for Planets around Young Stars. A warm Super-Jovian companion around HD 114082, a young star with a debris disk", 2022, A&A, 667, A14
5. Brandeker, A., Heng, K., Lendl, M., et al. (including **Patel, J. A.**), "CHEOPS geometric albedo of the hot Jupiter HD 209458 b", 2022, A&A, 659, L4
6. Tuson, A., Queloz, D., Osborn, H. P., et al. (including **Patel, J. A.**), "TESS and CHEOPS Discover Two Warm Sub-Neptunes Transiting the Bright K-dwarf HD 15906", 2023, (*Accepted for publication in MNRAS*)

POSITIONS AND SERVICES

January 2023	Program manager for a CHEOPS GTO program, *Terminators*.
December 2022	Member of a Local Organising Committee for CHEOPS Science Team Meeting - 27 in Kiruna, Sweden.
December 2021	Collaborator to the CHEOPS Science Team since December 2021.

INVITED TALKS/POSTER PRESENTATIONS

May 2023	Poster presentation in STScI Spring Symposium in Baltimore, USA (Virtual Attendance)
June 2022	Talk given at Annual PhD Conference at Department of Astronomy, Stockholm University, Sweden

OUTREACH

SCIENCE COLUMNIST JANUARY 2020

Before the pandemic, I served as a science columnist at the 'Science City' magazine (a popular science magazine in my native language) for a brief period; currently I write popular science article on my blog.

PROJECT DISHA JUNE 2017

The word 'Disha' means 'direction' in Sanskrit. Along with my colleagues, we started this project to help high school students with their career; to direct them in proper career path according to their skills.

References

Dr. Alexis Brandeker
Associate Professor, Department of Astronomy, Stockholm University, Sweden
@ alexis@astro.su.se
+46 8-553 785 39

Dr. Markus Janson
Professor, Department of Astronomy, Stockholm University, Sweden
@ markus.janson@astro.su.se
+46 8-553 785 48

Dr. Néstor Espinoza
Assistant Astronomer, Space Telescope Science Institute, Baltimore, USA
@ nespinoza@stsci.edu
+1 (410) 338 4331