

# Abhijeet Anand, PhD

Postdoctoral Fellow, Lawrence Berkeley National Lab, CA, USA

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## Research Interests

Astrophysicist specializing in galaxy formation, the circumgalactic/intergalactic medium, and quasar absorption lines. My work combines large-scale surveys (DESI, SDSS) with data science and computational methods to understand cosmic gas flows and the metal cycle in the Universe at different epochs. My long-term vision is to build an independent research program at the intersection of large surveys, data-intensive pipelines, and galaxyCGM/IGM connections.

## Professional Experience

Sep 2022 - present: Postdoctoral Fellow, Lawrence Berkeley National Lab, Berkeley, CA, USA

- *Leading/Led independent projects on metal absorbers in and around galaxies using DESI, producing the largest metal absorber catalogs.*
- *Developer and support scientist for the DESI spectroscopic pipeline; improved galaxy redshift estimation algorithms, reducing catastrophic failures by  $\sim 30\%$ .*
- *Contributed to high-impact DESI collaboration papers, while also initiating independent science projects within and outside the collaboration.*

Sep 2018 - Jul 2022: PhD Fellow, Max Planck Institute for Astrophysics, Garching, Germany

- *Conducted extensive studies on the gas distribution in the circumgalactic and intracluster medium using data from SDSS and DESI.*
- *Developed the quasar absorber finder, [qsoabsfind](#), a tool used for detecting and analyzing metal absorbers in quasar spectra.*

Sep 2017 - Jul 2018: UGC - JRF<sup>1</sup>, National Institute of Advanced Studies, Bangalore, India

## Education

Sep 2018 - Jul 2022: PhD in Astrophysics, Ludwig Maximilian University - Max Planck Institute for Astrophysics (MPA), Germany.

- Thesis: [Probing cool and warm circumgalactic gas in galaxies and clusters with large spectroscopic and imaging surveys](#)
- Advisors: [Prof. Dr. Guinevere Kauffmann](#) & [Dr. Dylan Nelson](#)

Jul 2016 - Jul 2017: MS, Physics, Indian Institute of Science (IISc), Bangalore, India.

- Thesis: [A sensitive search for HI 21 cm emission from super disks in radio galaxies](#)
- Advisor: [Prof. Nirupam Roy](#)

Aug 2012 - June 2016: BSc (Research), Physics, Indian Institute of Science, Bangalore, India.

- Thesis: [Sources of Continuum Opacity in Hydrogen deficient stars](#)
- Advisors: [Prof. Gajendra Pandey](#), Indian Institute of Astrophysics (IIA)

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<sup>1</sup>University Grants Commission, Govt. of India - Junior Research Fellowship

## Selected visits, talks and conferences

<sup>i</sup>Invited Talks, <sup>c</sup>Contributed Talks, <sup>s</sup>Schools & Workshops

- <sup>i</sup> June 2025: *Astro Webinar*, Raman Research Institute, Bangalore, India, June 23, 2025 (*Virtual*)
- <sup>i</sup> May 2025: *Astro Lunch seminar*, University of Washington, Seattle, USA, May 20, 2025 (*talk*)
- <sup>i</sup> Dec 2024: *Joint Astronomy Program Seminar*, IISc, Bangalore, India, Dec 11, 2024 (*talk*)
- <sup>c</sup> Dec 2024: *Baryons Beyond Galactic Boundaries*, IUCAA Pune, India, Dec 2 - Dec 6, 2024 (*talk*)
- <sup>c</sup> Nov 2024: *ISSAC Conference*, St. Stephen's College, New Delhi, Nov 20 - Nov 22, 2024 (*talk*)
- <sup>i</sup> Feb 2024: *Extragalactic Seminar*, MPA Garching, Germany, Feb 29, 2024 (*talk*).
- <sup>i</sup> Feb 2024: *Cosmology Seminar*, MPA Garching, Germany, Feb 27, 2024 (*talk*).
- <sup>i</sup> Mar 2022: *Computational Galaxy Formation and Evolution Group*, ZAH/ITA, University of Heidelberg, 14-16 Mar 2022 (*Visitor*).
- <sup>i</sup> Feb 2022: *High Energy Group Seminar*, MPE Garching, 15 Feb, 2022 (*Virtual*).
- <sup>i</sup> Feb 2022: *DESI Group Seminar*, Berkeley Lab, 1 Feb, 2022 (*Virtual*).
- <sup>i</sup> Dec 2021: *Galaxies & Cosmology Seminar*, CfA Harvard, 13 Dec, 2021 (*Virtual*).
- <sup>i</sup> Sep 2021: *STARs lab*, Arizona State University, 24 Sep, 2021 (*Virtual*).

## Mentoring

- Mentored Joanne Tan (MPA PhD): project on metal absorbers in TNG-100 simulations (manuscript in prep. for MNRAS).
- Supervised Shivansh Tiwari (UG, Delhi University): developed QSO continuum models for DESI data analysis, 2025-present.

## Honors & Awards

- Core member of the DESI Data Team; the DESI Collaboration awarded the 2026 [Berkeley Prize](#) of American Astronomical Society.
- [DESI Builder Award \(2025\)](#) for outstanding contributions to the data systems operations.
- DESI Early Career Travel Grant (USD 5000).
- [IMPRS PhD Fellowship](#), 2018–2022.
- University Grants Commission - Junior Research Fellowship of Govt. of India, 2017-2018.
- Department of Science & Technology, Govt. of India - Higher Studies Scholarship, 2012-2017.

## Programming skills

Programming Language —

- Python (numpy, scipy, astropy, scikit-learn, matplotlib), bash, SQL with focus on high-performance, large-scale survey pipelines.

Tools & Workflows —

- Git, Jupyter, slurm (NERSC), LaTeX, Unix/Linux

Open-source Contributions —

- [qsoabsfind](#): QSO metal absorber finder (*Developer*)
- [redrock](#): Redshift fitter for DESI (*Contributor*).
- [desispec](#): DESI spectroscopic pipeline (*Contributor*).

## Professional services & activities

Referee —

- Astronomy & Astrophysics (2023-), Astrophysical Journal (2023-), Internal Reviewer for DESI papers (2022-)

Member & Organizer—

- Core committee member, [DESI Professional Development Committee](#), (202425), contributed to early-career support and mentoring initiatives.
- Organizer, [INPA Weekly Seminar](#), Physics Division, LBNL (2023-2024).

Teaching Experience —

- Served as online physics tutor at E-acharya (>20 students)<sup>2</sup> from June 2017 to Aug 2018.

## Outreach activities

Press releases —

- My papers (I, II) featured in the monthly research highlight of MPA and appeared on [astrobites](#).

Interviews & podcast —

- Interviewed by [Vidpeds podcast](#) to discuss my astronomy journey and how people from small cities can become successful astronomers.
- Gave [interview](#) to [The Interview Portal](#) to help Indian college students plan their careers.

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<sup>2</sup>an initiative to help poor students in suburban and rural areas of Bihar, India.