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Prakhar Bansal

Curriculum Vitae

Education

2024– **Ph.D. in Physics**, *University of Michigan*, Ann Arbor, *4.12/4 GPA*
- Advisor: Dragan Huterer

2020–2024 **B.Tech in Electrical Engineering**, *Indian Institute of Technology Bombay*, Mumbai, *9.30/10 CGPA*
- with Minor in Physics
- Thesis 1: New Degrees of Freedom using N_{eff} measurements of CMB
- Thesis 2: Impact of Interacting Dark Matter on the Cosmological 21-cm Signal

Research Interests

Data Driven Cosmology: Dark Energy, Large Scale Structure, Higher Order Statistics, 21-cm Cosmology, Weak Lensing

Publications

Feb 2026 **Prakhar Bansal**, Dragan Huterer (Preprint): *On the Difficulties with Late-Time Solutions for the Hubble Tension* arXiv:2602.06293

July 2025 **Prakhar Bansal**, Dragan Huterer: *Expansion-history preferences of DESI DR2 and external data* Phys. Rev. D 112, 023528

March 2025 DESI Collaboration (including **Prakhar Bansal**): *DESI DR2 Results II: Measurements of Baryon Acoustic Oscillations and Cosmological Constraints* Phys. Rev. D 112, 083515

March 2025 DESI Collaboration (including **Prakhar Bansal**): *Validation of the DESI DR2 Measurements of Baryon Acoustic Oscillations from Galaxies and Quasars* Phys. Rev. D 112, 083512

(In prep) **Prakhar Bansal**, Shikhar Mittal, Girish Kulkarni, Vikram Rentala and Saurabh Singh: *Constraints on millicharged dark matter from the null-detection of 21-cm signal*

(In prep) DESI Collaboration (including **Prakhar Bansal**): *FOLPSD: an EFT/phenomenological approach for full-shape DESI DR2*

Awards & Honors

Nov 2025 **Rackham International Student Fellowship** ($14596)
one of 25 awardees out of 2400, sole Indian Alumni Fellow

May 2025 **Peter Franken Award** ($5000)
Departmental award to honor outstanding work by a first- or second-year Physics graduate student

Nov 2024 **Rackham Conference Travel Grant** ($1150)

Dec 2022 **MITACS Globalink** fellowship for pursuing undergraduate research in Canada

Jan 2023 **DAAD-WISE** fellowship for pursuing summer research in Germany (*declined*)

Oct 2020 **JEE Advanced** – All India Rank **240** out of 240,000 candidates

Sept 2020 **JEE Main** – All India Rank **150** out of 1.13 million candidates

March 2020 **International Chemistry Olympiad** – Indian National Camp (**top 45 nationally**)

2019, 2020 **International Astronomy Olympiad** – Indian National Olympiad qualifier (**top 300 nationally**)

April 2019 **KVPY Fellowship** – All India Rank **27** (top 0.02% nationally, awarded by DST, Govt. of India)

August 2018 **NTSE Scholarship** – awarded by NCERT (Govt. of India, top 1,000 students nationally)

Presentations

August 2025 **University of Michigan**, Ann Arbor, USA
Constraining Late-Time Cosmology with DESI DR2: BAO, Power Spectrum, and Bispectrum (PhD Prelim Talk)

July 2025 **UCO 2025 Meeting**, Benasque, Spain
Expansion history preferences of DESI DR2 and external data

July 2025 **DESI Summer Collaboration Meeting**, Berkeley, USA
Expansion history preferences of DESI DR2 and external data

Dec 2024 **DESI Winter Collaboration Meeting**, Cancun, Mexico
Exploring the w_0w_a preferences in the Y1 BAO data

Dec 2024 **Cosmology on the Beach**, Playa del Carmen, Mexico
Exploring the w_0w_a preferences in the Y1 BAO data

Collaborations and Professional Activities

2024-Present **Dark Energy Spectroscopic Instrument (DESI)**
DESI is the world's leading galaxy survey, mapping tens of millions of galaxies and quasars to measure the expansion history of the Universe and probe the nature of dark energy.

- **Research Service**: Contributed to the DR2 BAO analysis while working the Cosmological Parameter Estimation (CPE) and the Galaxy Quasar Clustering (GQC) working groups. Implemented FOLPSD theory power spectrum and bispectrum codes to the full shape pipeline. Currently working on implementing and testing theory codes for DR2 Modified Gravity analysis.
- **Volunteering Service**: Developed jupyter notebooks explaining various cosmological distances for DESI High; DESI's educational program for high school students

Teaching Experience

2024–25 **Graduate Student Instructor**, *University of Michigan*
PHYSICS 241 (Undergraduate Electromagnetism Lab)
Fall 2024, Winter 2025, Fall 2025
Responsibilities: Conducted weekly labs, graded lab reports, and held office hours.

2021–23 **Teaching Assistant**, *IIT Bombay*
PH 107 (Quantum Physics and Applications), PH 108 (Electricity & Magnetism),
PH 251 (Classical Mechanics), PH 111 (Introduction to Classical Physics),
CH 107 (Quantum Chemistry)
Fall 2021 – Spring 2023
Responsibilities: Led weekly tutorials, graded exams, and discussed problem sets.

References

Prof. Dragan Huterer, *(huterer@umich.edu)*, Ph.D. Advisor

Prof. Vikram Rentala, *(rentala@phy.iitb.ac.in)*, Undergraduate Advisor

Prof. Girish Kulkarni, *(kulkarni@theory.tifr.res.in)*, Collaborator