

ANEESH BABURAJ

(he/him/they)

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EDUCATION

UC San Diego, La Jolla, CA, USA

June 2022 - Present

Ph.D. in Physics (Expected)

UC San Diego, La Jolla, CA, USA

September 2019 - May 2022

Masters in Physics

GPA: 3.85/4

Indian Institute of Science, Bengaluru, Karnataka, India

August 2015 - May 2019

Bachelor of Science (Research)

GPA: 7.1/8

Major : Physics

SELECTED RESEARCH EXPERIENCE

Department of Astronomy & Astrophysics,

UC San Diego

July 2020 - present

Graduate research (Advisor: Dr. Quinn Konopacky)

- Atmospheric characterization of directly imaged companions and their host stars to constrain formation scenarios.
- Analysis of high-resolution host star spectra from the Levy spectrograph at Lick (Baburaj et al. 2024), and the GHOST spectrograph at Gemini South.
- Analysis of JWST NIRSpec IFU data for GJ 504b (GTO 2778; PI Perrin) and HD 206893B (GO 5485; PI Baburaj).

Raman Research Institute (RRI), Bengaluru, India &

Indian Institute of Science (IISc)

August 2018 - April 2019

Bachelor's thesis (Primary advisor: Dr. K. S. Dwarakanath, RRI; Co-advisor: Dr. Nirupam Roy, IISc)

- Impact of merger of the cluster A3376 on the star formation rates (SFR) of the various types of galaxies within the cluster using observational data from the OmegaWINGS survey

Max Planck Institute for Astrophysics, Garching, Germany

May 2018 - July 2018

Summer Project (Advisor: Dr. Guinevere Kauffmann)

- Analysis of results of the large-scale cosmological simulation Illustris to improve abundance matching relations between the observable properties of galaxies and properties of its dark matter halo.

SELECTED PUBLICATIONS

1. **Baburaj, A.**, Konopacky, Q., Theissen, C., Peacock, S., Huseby, L., Fulton, B., Gerasimov, R., Barman, T., Hoch, K., 2024, "A High-Resolution Spectroscopic Survey of Directly Imaged Companion Hosts: I. Determination of diagnostic stellar abundances for planet formation and composition", AJ, in press, arXiv e-prints, arXiv:2409.14239
2. **Baburaj, A.**, Konopacky, Q., Barman, T., Crossfield, I; Hoch, K., Ruffio, J.-B., Sappay, B., Theissen, C., 2023, "How big can you make a planet? Spectroscopic characterization of HD 206893B", JWST Proposal Cycle 3, 5485

GRANTS & FELLOWSHIPS

1. **JWST Cycle 3 grant** *begins November 2024*
A grant from the Space Telescope Science Institute (STScI) for the Cycle 3 program GO 5485 (PI Baburaj) for spectral characterization of the $28M_{Jup}$ companion HD 206893B.
2. **Future Investigators in NASA Earth and Space Science and Technology (FINESST)** *September 2023 - present*
A grant from NASA to support research on individual elemental abundances for directly imaged planet host stars.
3. **Kishore Vaigyanik Protsahan Yojana (KVPY) fellowship** *August 2015 - August 2019*
A fellowship from the Department of Science and Technology (DST), Government of India, to pursue an undergraduate degree in Basic Sciences.
4. **National Talent Search (NTS) fellowship** *August 2013 - August 2015*
A fellowship from the Human Resource Development (HRD) Ministry, Government of India, for meritorious high school students.

SELECTED TALKS

- “Two Halves of a Whole: Constraining Planet Formation via High-Resolution Spectroscopy of Host Stars and their Companions” Invited Talk. Northwestern/CIERA Observational Group, Evanston, IL, October 24
- “Constraining Directly Imaged Planet Formation using High Resolution Spectroscopy of Host Stars” Talk. STScI Spring Symposium, Baltimore, MD, May 23
- “High Resolution Spectroscopy of Directly Imaged Planet Hosts” Invited Talk. STScI Exoplanets and High Contrast Imaging Group, Baltimore, MD, June 22

TEACHING, MENTORING, AND OUTREACH EXPERIENCE

Astronomy & Astrophysics Outreach Committee *September 2024 - Present*

Serving on the Astronomy & Astrophysics Department Outreach Committee for the academic year 2024–25, organizing outreach activities throughout San Diego.

Undergraduate Research Mentor *June 2024 - Present*

Mentored Ms. Camila Martinez, a junior undergraduate visiting from UC Santa Cruz as part of the STARS program. The project involved forward modeling Levy spectra of the directly imaged host star zeta Del to determine basic atmospheric parameters (temperature, surface gravity, metallicity). Ms. Martinez is continuing the project for the Fall 2024 quarter and will be presenting a poster at AAS 245 in January 2025.

Barrio Logan Science & Art EXPO *April 2024*

San Diego Festival of Science and Engineering EXPO Day *March 2024*

Astronomy on Tap San Diego *February 2024*

Gave a public talk at the first post-Covid Astronomy on Tap in San Diego.

Teaching assistant (Lower Division Physics) *September 2019 - September 2021*

Organized labs and discussion sessions for around 50 students per semester, graded their lab reports, proctored their exams, and addressed their concerns.