

AKSHATHA K VYDULA

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School of Earth and Space Exploration: 781 Terrace Mall Tempe, Arizona 85281

EDUCATION

Arizona State University, Tempe-AZ, USA

Ph.D., Astrophysics (Expected April 2025)

School of Earth and Space Exploration

Thesis: Exploring the Fundamental Physics of the Universe Across Dynamic Scales: From Neutrons to Cosmic Reionization Bubbles

August 2020 - Present

Cumulative GPA: 4.00/4.00

RV College of Engineering, Bengaluru-KA, India

B.Engineering, Electronics and Communication

2016-2020

GPA 9.65/10.00

RESEARCH INTERESTS

Computational Astronomy, Dark Ages, Cosmic Dawn, Epoch of Reionization, Data analysis and instrumentation, Planetary science neutron spectroscopy

RESEARCH EXPERIENCE

Graduate Research Associate

August 2020 – Present

Arizona State University

Graduate Research Assistant

May – July: 2021, 2022, 2023

Los Alamos National Laboratory

Undergraduate Research Fellow

January – May 2020

University of Groningen, Netherlands

Indian Academy of Sciences Fellow

June – July: 2018, 2019

Raman Research Institute, India

PUBLICATIONS

1. **A.K. Vydula**, J.D. Bowman, D. Lewis, K.Crawford, M. Kolopanis, A.E.E. Rogers, S.G. Murray, N. Mahesh, R.A. Monsalve and P.Sims (2023) *Low-Frequency Radio Recombination Lines Away From the Inner Galactic Plane* <https://doi.org/10.3847/1538-3881/ad08ba>
2. **A.K. Vydula**, D.D.S. Coupland, K.E. Mesick, B. Weaver, C. Hardgrove *Systematics in Measurement of Neutron Lifetime using Space-based Neutron Spectrometer* (Submitted to Physical Review.)
3. Sims, P. H., Bowman, J. D., Mahesh, N., Murray, S. G., Barrett, J. P., Cappallo, R., **Vydula, A. K.** (2022). *A Bayesian approach to modelling spectrometer data chromaticity corrected using beam factors–I. Mathematical formalism.* <https://doi.org/10.1093/mnras/stad610>
4. Murray, S.G., Bowman, J.D., Sims, P.H., Mahesh, N., Rogers, A.E., Monsalve, R.A., Samson, T. and **Vydula, A.K.**, 2022. *A Bayesian Calibration Framework for EDGES.* <https://doi.org/10.1093/mnras/stac2600>
5. Sims, P. H., Bowman, J. D., Mahesh, N., Murray, S. G., Barrett, J. P., Cappallo, R., **Vydula, A. K.** *BaNTER: a Bayesian Null-Test-Evidence-Ratio-based validation framework* (Submitted to MNRAS)

TECHNICAL MEMOS

1. [EVLA Memo #228](#), [LoCo Memo #52](#): VLA 4-band Beam Width Measurement Using the Holography Observing Mode
2. [LoCo Memo #51](#) Observing Campaign for LWA Beam measurements
3. [LoCo Memo #50](#) Sensitivity analysis of pulsar beam mapping with the LWA and VLA
4. [LoCo Memo #49](#) Beam Mapping of LWA using Pulsar Gating
5. [LoCo EDGES Memo #200](#): Bench tests for EDGES-3 Ground Plane Resonance
6. [LoCo EDGES Memo #201](#): Ground Plane Resonance testing at the EDGES WA site
7. [LoCo EDGES Memo #202](#): EDGES WA Site Trip Summary Feb 2024
8. [LoCo EDGES Memo #203](#): Updates on `edges` software suite for EDGES-3 data analysis
9. [LoCo EDGES Memo #204](#): Investigation of reflections in long cable calibration source in EDGES absolute calibration design
10. [LoCo EDGES Memo #206](#): Validation of edges-cal using simulated sky signal

INVITED TALKS

1. Radio Astronomy techniques to measure the Global 21cm signal from the early Universe **Karnataka Physics Teachers Association** (Nov 24, 2024)
2. Space Archaeology : Studying early Universe using remote radio telescopes at **San Jose Astronomy Association** (Oct 19, 2024)
3. A Day in a life of a Radio Astronomer at **RV College of Engineering** (Oct 15, 2024)
4. Studying Cosmic Dawn using remote Radio telescopes at **Gulbarga Science Center, India** (Oct 8, 2024)
5. Low Frequency Radio Recombination Lines with EDGES at **LuSEE-Night Seminar** Brookhaven National Laboratory Long Island, NY (Nov 9, 2023)
6. Space Archaeology: Using 21cm signal to study the early Universe at **Annular Solar Eclipse 2023 county science outreach**, Kanab Utah (Oct 14, 2023)
7. Using MCNP to measure the Neutron Lifetime in Planetary Environment at **MCNP User Symposium, 2022**, Los Alamos National Laboratory (Oct 20, 2022)
8. Studying Early Universe as an Engineer turned Radio Astronomer at the **Cosmic Chronicles talk series**, RV College of Engineering, India (Sep 6, 2022)
9. Studying Early Universe using Low Frequency Radio Telescopes at **Grad-to-Grad Colloquium**, Dept. of Physics, ASU (Apr 29, 2022)
10. Transition from Engineering to Astrophysics at **National Space Society-USA, Mumbai** (Jan 24, 2022)

TALKS

1. Validation of EDGES software suite using 10 days of EDGES-3 data **2025 National Radio Science Meeting, Boulder, CO** (Jan 2025)
2. Progress on EDGES-3 Data analysis at **7th Global 21cm Workshop, Raman Research Institute, Bengaluru** (Oct 2024)

3. Low frequency science: Radio Recombination lines and Beam holography at **Caltech Lunch Seminar** (July 9, 2024)
4. Beam Mapping of VLA 4-band using dish holography **SESE Annual Symposium** (Aug 2023)
5. Beam Mapping of LWA using Pulsar Holography **38th Annual New Mexico Symposium** (Feb 2023)
6. Low-Frequency Radio Recombination Lines Away From the Inner Galactic Plane at **241st AAS Winter Meeting, Seattle WA** (Jan 2023)
7. Low-Frequency Radio Recombination Lines using EDGES at **5th Global 21cm Workshop, UC Berkeley** (Oct 2022)
8. Effects of surface temperature and compositions on the measurement of Neutron lifetime at **Space Science and Applications (ISR-1) Seminar, LANL** (Jul 19, 2022)
9. Measurement of Neutron lifetime using Space based Neutron Spectrometer at **LANL Summer Symposium (Aug 3-4, 2021)**.
10. Measurement of Neutron lifetime using Space based Neutron Spectrometer at **SESE Annual Symposium (Aug 18, 2021)**.

AWARDS & VOLUTEERING

1. Graduate Student Government travel award (\$1600, 2024-2025 academic year)
2. ComSciCon 2024 Fellow: Offered to 50 out of 800-1200 applicants each year
3. Chambliss judge at 241st AAS Winter meeting Seattle WA (Jan 2023).
4. SESE Student Award: Dept award covering part of tuition (Fall 2020, Summer 2021)
5. ASU Sundial Mentor - designed one week program with a focus on exoplanets for early start freshman undergrads majoring in Physics, Astrophysics and Mathematics.
6. SESE Outreach coordinator: Outreach representative of Low-Frequency Cosmology Lab
7. 2020 Best Outgoing student of RV College of Engineering
8. 2019 IIE WeTech Goldman Sachs Scholar (offered to only 45 female students/year in STEM fields across India)
9. Organized bi-weekly Astrophysics Journal Club for graduate students at SESE (2021-2022)
10. Co-Founder of dhRuVa, Astrophysics Club of R V College of Engineering (2018).
11. Chair of IEEE Student chapter of RV College of Engineering in 2019.
12. Editor of bi-annual newsletter of RV College of Engineering (Jan-2018 to Dec-2019)