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 *August 2020 - Present*
Ph.D., Astrophysics Cumulative GPA: 4.00/4.00
School of Earth and Space Exploration

RV College of Engineering, Bengaluru-KA, India *2016-2020*
B.Engineering GPA 9.65/10.00
Department of Electronics and Communication

RESEARCH INTERESTS

Computational Astronomy, Epoch of Reionization, High redshift radio astronomy, Data analysis and instrumentation, Planetary science neutron spectroscopy

RESEARCH EXPERIENCE

Graduate Research Associate Arizona State University (Aug 2020-present)
Advisors: Prof. Judd Bowman and Prof. Danny Jacobs
I work at the Low Frequency Cosmology lab, focusing on radio astronomical data analysis for detecting signal from Epoch of Reionization, mainly using EDGES and OVRO-LWA.

Graduate Research Assistant Los Alamos National Laboratory (May 2021-present)
Advisor: Dr. Daniel Coupland
Collaborators: Dr. Katherine Mesick, Dr. Brain Weaver & Prof. Craig Hardgrove
I worked on simulations and numerical modelling for measurement of Neutron lifetime using space-based neutron spectrometer.

Undergrad Research Fellow University of Groningen, Netherlands (Jan 2020 - May 2020)
Advisors: Prof. Leon Koopmans & Prof. Harish Vedantham
I developed a pipeline for the analysis and detection of radio recombination lines using very high spectral resolution observations from LOFAR EoR fields around North Celestial Pole.

Indian Academy of Sciences Fellow Raman Research Institute, India (Jun 2019-Jul 2019)
Advisor: Prof. Avinash Deshpande
I worked on Primary beam pattern measurements of Sky Watch Array Network (SWAN).

Indian Academy of Sciences Fellow Raman Research Institute, India (Jun 2018-Jul 2018)
Advisors: Prof. Udaya Shankar & Prof. Ravi Subramaniam
I worked on Application of wavelets for the detection of the redshifted Global 21cm signal from the Epoch of Reionization.

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. 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

3. 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

MEMOS

1. LoCo EDGES Memo #200: Bench tests for EDGES-3 Ground Plane Resonance
2. EVLA Memo #228, LoCo Memo #52: VLA 4-band Beam Width Measurement Using the Holography Observing Mode
3. Loco Memo #51 Observing Campaign for LWA Beam measurements
4. LoCo Memo #50 Sensitivity analysis of pulsar beam mapping with the LWA and VLA
5. LoCo Memo #49 Beam Mapping of LWA using Pulsar Gating

INVITED TALKS

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

TALKS

1. Beam Mapping of VLA 4 band using dish holography **SESE Annual Symposium** (Aug 2023)
2. Beam Mapping of LWA using Pulsar Holography at **38th Annual New Mexico Symposium** (Feb 2023)
3. Low-Frequency Radio Recombination Lines Away From the Inner Galactic Plane at **241st AAS Winter Meeting, Seattle WA** (Jan 2023)
4. Low-Frequency Radio Recombination Lines using EDGES at **5th Global 21cm Workshop, UC Berkeley** (Oct 2022)
5. Effects of sub-surface temperature and surface compositions on the measurement of neutron lifetime using a space-based neutron spectrometer at **Space Science and Applications (ISR-1) Seminar, LANL** (Jul 19, 2022)

6. Measurement of Neutron lifetime using Space based Neutron Spectrometer at **LANL Summer Symposium (Aug 3-4, 2021)**.
7. Measurement of Neutron lifetime using Space based Neutron Spectrometer at **SESE Annual Symposium (Aug 18, 2021)**.

RELEVANT EXPERIENCES & ACHIEVEMENTS

— Chambliss judge at 241st AAS Winter meeting Seattle WA (Jan 2023).
— 2020 Best Outgoing student of RV College of Engineering
— IIE WeTech Goldman Sachs Scholar 2019
— SESE Outreach coordinator: Outreach representative of Low-Frequency Cosmology Lab
— ASU Sundial Mentor
— Organized bi-weekly Astrophysics Journal Club for graduate students at SESE (2021-2022)
— Co-Founder of dhRuVa, Astrophysics Club of R V College of Engineering (2018).
— Chair of IEEE Student chapter of RV College of Engineering in 2019.
— Editor of bi-annual newsletter of RV College of Engineering (Jan-2018 to Dec-2019)
— Secured 78th rank in the State level Common Entrance test of Karnataka (K-CET, 2016, taken by 0.5 million students annually).