Akshatha Gopinath

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EDUCATION

M.Sc. in Astronomy and Research   *September 2018 - Present*
Leiden University   Current GPA: 7.9/10

B.Eng. in Electrical and Electronics   *August 2014 - June 2018*
BMS College of Engineering   GPA: 8.9/10

PROJECTS

- **M.Sc. final thesis - Reconstructing the synchrotron cosmic web**   *Sep '19 - Present*
  Advisor : Dr. Reinout van Weeren and Martijn Oei, Leiden University
  Working on reconstructing the synchrotron cosmic web using observable parameters, by developing a prediction method using existing simulations of cosmological structure formation. The goal is to to apply this prediction to search for the web in the Lockman Hole field where we have a very deep LOFAR image from.

- **M.Sc. first thesis - Matching kernel method for comparing datasets - for the transition disk around RXJ1615.3-3255**   *Sep '18 - Jul '19*
  Advisor : Prof. Christoph Keller, Dr. Jos de Boer and Dr. Christian Ginski, Leiden University
  Grade : 8.5/10
  The project involved analysis how data of the same object, recorded with different instruments, observing modes or in different wavelengths can be combined while taking the variations of the instrumental response function into account. A matching kernel to convert one PSF response to another was developed, and different conditions under which this matching kernel is efficient and otherwise were explored.

- **B.Eng. final project - Beamforming in Phased Array Antennas**   *Sep '17 - Apr '18*
  Advisor : Dr. Anandan V.K, Indian Space Research Organization
  Grade : 10/10
  Studied the performance of linear and planar antenna array systems and implemented beamforming algorithms. Simulated antenna radiation patterns for different kinds of antennas and isotropic linear and planar arrays in MATLAB. Effect of variation in number of antenna elements and spacing between elements on the radiation pattern and resolution was observed. Adaptive algorithms such as Least Mean Squares, Recursive Least Squares and Constant Modulus were compared.

- **Radio Telescope to monitor the Sun**

  - *Jul '16 - Sep '16* : Built a radio telescope using a 60 cm diameter television dish antenna, satellite finder, Arduino microcontroller and RadioSkyPipe software to monitor the Sun. Plotted Sun's drift scan and calculated its brightness temperature at 11.2 GHz using Rayleigh Jeans' approximation.

  - *Dec '17 - Jan '18* : *Advisor - Prof. R. Ramesh, Indian Institute of Astrophysics*
    I subsequently recorded the sun, moon and galactic background drift scans with better pointing accuracy. I also tried interferometry with two such dishes; and I developed and tested the analog and digital back end receivers for the same, and obtained solar interferometric fringes.

- **Sensory Motor Rhythm based Brain Computer Interface**   *Sep '16 - Nov '16*
  Applied signal processing techniques to EEG signals, to develop a brain computer interface that could recognize direction of desired movement, on MATLAB. Wrote the code to employ Fast Fourier Transform, butterworth filter and wavelet transform algorithms.

ADDITIONAL COURSES AND WORKSHOPS

- **Camp for Hands-on Experience in Radio Astronomy (CHERA)** *Jun - Jul '18*
  One of the seven selected from across the country for the radio astronomy camp conducted by Raman Research Institute and Indian Institute of Astrophysics at the Gauribidanur Radio Observatory. Learnt about radio galaxies, CMBR, radiation processes, applied de-dispersion and obtained pulsar signatures from recorded data of the Vela pulsar, recorded and processed solar interferometric fringes from a log periodic dipole antenna interferometer, built a dipole antenna system for 360 MHz, and understood the hardware and working of phased array antennas in radio astronomy.

- **Research Education Advancement Program (REAP), Physics** *Aug '16 - Mar '18*
  Completed 2 course years with an A+ grade, at Jawaharlal Nehru Planetarium in collaboration with leading Indian institutes like Indian Institute of Science , Indian Institute of Astrophysics, International Centre for Theoretical Sciences and Raman Research Institute. Subjects included Astronomy, Electrodynamics, Quantum Mechanics, Fluid Dynamics and Physics lab.

- **Course on Cosmology** *Jan - Feb '16*
  Completed the 6 week cosmology course by Prof. C. Sivaram at the MP Birla Institute of Fundamental Research.

TECHNICAL SKILLS

Computer Languages	Python, MATLAB
Software & Tools	CASA, DS9, LaTeX, LabVIEW, Simulink

AWARDS AND SCHOLARSHIPS

- **National Talent Search Examination awardee** : National level scholarship awardee. Secured a rank of 23 in the state level examination.

- **National Program of Fellowship in Basic Sciences, 2011** : Secured a national rank of 881 in KVPY SA stream examination conducted by the Indian Institute of Science.

EXTRA-CURRICULAR

- Founded the Astronomy club of BMS College of Engineering (BMSCE) in February 2016, presently having over 400 members. Hosted star-gazing sessions, quizzes, various guest lectures, student talks and outreach programs for government schools. Interested in visual amateur astronomy.

- Active volunteer of the Rotaract club of BMSCE. Formulated and taught the science and mathematics syllabus for iTeach, their outreach program for underprivileged high school students in various government schools in Bangalore. Participated in the National Service Scheme outreach programme to rural populations in Kolar district and introduced them to basics of astronomy and telescopes.

- Have taken on leadership roles at the IEEE-BMSCE student chapter (as its Student Activities Coordinator for 2015-16) and the Mathematics society of BMSCE (as a core committee member 2015-16).

- Practising and performing the Indian classical dance form, Bharatanatyam, for 13 years. Completed the highest level of state-offered certification - Vidwat.