Poruri Sai Rahul

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Objective

Graduate school admission in a doctoral programme in the field of Astronomy and Astrophysics, followed by a career in research and teaching.

- **Research interests:** Astronomical Surveys and real-time event detection and classification, Galactic and Extra-galactic Astronomy, Instrumentation.

Education

- **Indian Institute of Technology, Madras** — Chennai, India
  BS./MS. in Physics — Aug. 2009 – Present
  - Major: **Physics**; Minor: **Chemistry**
  - Key Courses: General Relativity & Cosmology, Radiative Processes in Astrophysics Electromagnetic Theory, Optics & Photonics, Engineering Optics, Techniques of Physical Measurement, Advanced Electronics & Adv. Elec. Lab, Classical Field Theory, Atomic & Molecular Physics, Physical chemistry & Spectroscopy.

Research Experience

- **Constructing the Tully-Fisher relationship for SAMI galaxies.** — Melbourne, Australia.
  Prof. Jeremy Mould, CAS, Swinburne University of Technology. — Dec 2013 – Jan 2014
  - Queried NED for the inclinations of SAMI galaxies and acquired SDSS r, i & z apparent magnitudes for galaxies with inclinations $> 45^{\circ}$
  - Analyzed the 3D IFS data for positive Hα detections and extract FWHM of the emission line to estimate the rotation velocity.
  - Constructed a Tully-Fisher(TF) relationship using the SDSS r, i & z absolute magnitudes and the rotation velocity. Error in inclination is observed to be the largest source of scatter in the TF reln.
  - Following the TF reln, we intend to extract velocity dispersion σ from the Mg triplet using the pPXF package and use σ/V_c as a dynamical third parameter to extend the TF reln into a 3D manifold.
- **Colors of 146,659 Quasars in the SDSS DR9.** — Trivandrum, India.
  Prof. Anand Narayanan, Indian Institute of Space science & Technology. — June 2013 – July 2012
  - Partially reproduced and extended the results of Richards et al. (2001)
  - Queried and acquired SDSS apparent magnitudes, errors and redshift values for 146,659 quasars from the SDSS DR9.
  - Reproduced the color-color, color-redshift and median color-redshift plots.
- **Observation of the pulsar PSR B1749-28.** — Ooty, India.
  Ooty Radio Telescope, NCRA-TIFR. — July 2013.
  - Observed the pulsar PSR B1749-28 and it's corresponding calibrator for 30 minutes each using the Ooty radio telescope.
  - Various properties of the pulsar – Period, Strength/Flux of the pulsar and dispersion measure were estimated from the data. Analysis was done using SIGPROC.
  - Introductory courses on pulsar science were conducted over the course of a week as part of "Pulsar Observatory for Students" program by NCRA-TIFR.
- **Polarimetric study of the star-forming region Stock 8.** — Nainital, India.
  Aryabhatta Research Institute for Observational Sciences. — March 2013.
  - Analyzed polarimetric data corresponding to the star forming region Stock 8 in the constellation Auriga. Data was acquired using the ARIES Imaging Polarimeter AImPol at the Sampurnanand 104cm telescope.
  - We estimated the amount of polarization caused by dust particles in the star-forming cloud and inferred the average size of the dust grains to be 0.58 μm, which is the galactic average.
  - We also studied the magnetic field orientation in the molecular cloud, found to be parallel to the galactic equator and distinguished probable cluster members from foreground and background stars. Analysis was done using IRAF.
  - Introductory lectures on observational astronomy and astronomical instrumentation over the course of 2 weeks as part "ARIES Training School on Observational Astronomy" program by ARIES.

- **IIST Astronomy & Astrophysics School.** Trivandrum, India.
  Indian Institute of Space science & Technology. Dec 2012.
  - Lecture series on stellar formation & evolution, observational astronomy, galactic & extra-galactic astronomy and techniques in astronomy i.e astrometry, photometry, spectrosccopy, polarimetry & interferometry.

Positions of Responsibility

- **Head, Astro IITM** Chennai, India
  IIT Madras Academic years 2010 – 2014
  - Handled the organization of talks on amateur astronomy and observation sessions.
  - As part of a club project, a rudimentary photometry was done of the Algol binary system using the 8-inch telescope on campus and a canon DSLR camera.
  - Organized outreach activities to schools in and around Chennai, to acquaint school students to astronomy and hopefully, and inspire towards pursuing science as a career.
- **Co-Ordinator, Astronomy Workshops** Chennai, India
  Shaastra, IIT Madras Oct. 2010 & Oct. 2011
  - Succesfully conducted workshops on Astro-Photography during Shaastra 2011 & on Telescope making during Shaastra 2010.
  - Lectures and hands-on sessions on Astro-Photography were conducted with the help of renowned astro-photographer, Dr. Suresh Mohan.
  - Theory sessions on the workings of a CCD, hands-on astro-photography sessions and Image processing were conducted over the course of 4 days.
  - At the end of the telescope making workshop, 10 participant teams had built fully operational 4 inch newtonian telescopes with dobsonian mounts.
- **Event Co-Ordinator, EML Team** Chennai, India
  Extra Mural Lecture Team, IIT Madras Academic Year 2010 – 2011.
  - Part of the team that organized lectures by eminent Indians such as Dr. A.P.J Abdul Kalam, Shri N. Gopalaswami, Cmd. C. Uday Bhaskar, Mr. P. Sainath, Mr. Atul Kulkarni.
- **Hostel Co-Ordinator & Counselor** Chennai, India
  Mitr team, IIT Madras Academic Years 2010 – 2014.
  - Co-Ordinated a team of 10 student counselors spread across all years to handle the counsel/facilitate the needs of 120 freshers across all branches, get them acquainted to college life and guide them through the perils of their first year of college.
  - I was previously part of the counseling team as a student counselor for 2 years.
  - As part of the Mitr team, we also organized mock quizzes for the freshers to get acquainted to the exam format.

Achievements & Awards

- **SimChamp 2012:** Part of a 3 member team that placed 1st in an Intra-IIT programming contest. The challenge was to simulate the ant colon behavior as factors such as Avg. ant age, load bearing capacity, speed of ants and duration between meals were taken into consideration for the simulations.
- **Stress Interview 2012:** Placed 2nd in an event where a panel of alumni put the participant in an interview scenario and judged their performance. The event was part of Deep Woods, the annual cultural festival of the Madras Christian College, Chennai.
- **INSPIRE Scholarship Recipient 2009 – 2011**

Skills

- **Languages:** C, Python, LaTeX, Bash, HTML, CSS, SQLquery
- **Scientific tools:** Matlab, Mathematica, GNUPlot.