TILAKSINGH PAWAR

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RESEARCH INTERESTS

Photometric and spectroscopic analysis of hot subdwarf stars in eclipsing binary systems, spectro-photometric analysis of stellar-exoplanet systems, stellar and planetary evolution in short period systems, pulsation study of stars, dark matter distribution of Milky-way halo using proper motions of runaway stars.

EDUCATION

Master of Science (Astrophysics) — Universität Potsdam *April 2018 - Present*

Bachelor of Science (Physics) — Fergusson College, Pune *July 2014 - July 2017*
(Minor in: Mathematics, Chemistry)
Principal Total: 80.83%

Class XII — Jai Hind Junior College of Science, Chandrapur *2012 - 2014*
Overall Percentage: 85.85

COMPUTER LITERACY

Programming Languages: Python, C, Matlab, SQL, Bash scripting, LaTeX
Softwares and Tools: IRAF, TOPCAT, SPAS, lcurve, Virtual Observatory, SAOImage DS9, Dominion Astrophysical Observatory Photometry package (DAOphot), Jupyter Lab, Astrometrica, Gnuplot, MS Office.
OS: Linux, Windows

RESEARCH EXPERIENCE

Master's Thesis (Advisor: Prof. Dr. Dr. Stephan Geier)
Title: Variability in Hot Subdwarfs stars
Study of Hot Subdwarf stars in binaries, usually with a cooler companion exhibiting a 'reflection effect'. Observation and reduction of photometric data and plotting light curves to determine the systemic parameters.
Observations and analysis of single hot sdB stars for detection of long period gravity mode pulsations.

Photometric analysis of eclipsing binaries
Creating a target list for observations at 0.65 m telescope at Ondřejov, Czech Republic, using TOPCAT. Reduction of raw data using Image Reduction and Analysis Facility (IRAF).
Modelling of the light curves to determine system parameters and classifying the primary and secondary.

Photometric analysis of open star clusters M52 and NGC6939
Observation of stellar clusters using 0.356 m telescope at Universität Potsdam.
Data analysis using GDL script and fitting isochrones to determine age of clusters.

Spectroscopic analysis and classification of stars from Geier Catalogue
Learned ADQL and TOPCAT for making candidate sets from the Geier and ATLAS catalogues.
Took spectroscopic observations using DADOS spectrograph with 0.356 m telescope at Universität Potsdam. Performed Calibration and modelling of spectra using python scripts and Spectrum Plotting and Analysis Suite (SPAS).

Bachelor's Thesis (Advisor: Prof. Dr. D. Bhattacharya)
Title: Developing a geopotential model of Earths gravitational field by tracking AstroSat
Studied Keplerian and post-Keplerian parameters of AstroSat′s orbit for calculating the J2 coefficient of earths gravitational field.

ACHIEVEMENTS AND SCHOLARSHIPS

- **Innovation in Science Pursuit and Research (INSPIRE) scholarship**
  Awarded by Department of Science & Technology, Government of India, for ranking in the top 1 % in the Grade 12 examination.
- **Winner at Inter College Science Exhibition** — Designed a portable microscope 150x magnification power using normal glass capillary, which could be used to observe cells and rock samples (2015).
- **Winner at 'Aditya-Our Sun'** — Inter state Astronomy quiz.
- Made **1 provisional and 24 preliminary discoveries of Near-Earth Objects and Main Belt Asteroids** as a part of the International Astronomical Search Collaboration's International Asteroid search program, 2017.

TEACHING EXPERIENCE AND PUBLIC OUTREACH

- Worked as a fellow at **Science Education Initiative (SEI)** *July '15-June '16; (Pune,India)*
  Science Education Initiative (SEI) is a program aimed at working towards empowerment of primary education (Grade 4 to 7), for under-privileged students. The teaching involves elementary concepts of Science and Mathematics that form the necessary base for higher education.
- Worked as a member of **Disha Initiative, Pune** *Jan 2015* Teaching basic Physics, Mathematics and Astronomy to under-privileged school students in villages around the city of Pune, India.
- Volunteered at Savitribai Phule Pune University for National Science Day Exhibition. *Feb 2016*
- As head of astronomy club at Fergusson College, Pune. *2014-2017*
  - Organized 3 editions of an annual national seminar 'Frontiers in Physics' for more than 200 students.
  - Organized weekly problem solving sessions and monthly talks in Physics and Astronomy for students.
  - Organized 5 public exhibitions on topics covering Physics and Astronomy.
  - Organized a one day sunspot observation program and a night sky observing camp for students of Fergusson College.
  - Organized Geminids Meteor Shower observing sessions for ∼50 students (2014-2016) and uploaded the statistical data to International Meteor Organization (IMO).

CO-CURRICULAR ACTIVITIES

Activity	Title	Date and Duration
Conference	Annual Astronomische Gesellschaft meeting	2 days-September'19
Workshop	Research workshop on evolved stars	2 weeks-September 19
Conference	Stars on the Run 2	5 days-August'19
Conference	9^{th} Meeting on Hot Subdwarfs and Related Objects	3 days-June'19
Workshop	Introduction to Solar Astrophysics	3 days-Dec 16
Conference	19^{th} Space Science Symposium	4 days-Feb '16
Workshop	Hands on Astronomy	10 days-December '14