Neelesh Amrutha

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Github: nishamrutha

Education

The Australian National University — Canberra
Doctor of Philosophy — 2023–Current
- Astronomy and Astrophysics
- Supervisory Panel: A/Prof. Christian Wolf (Chair), Dr. Christopher Onken, Prof. Rachel Webster
- Thesis topic (tentative): Understanding AGN sub-types: Orientation, Obscuration and Accretion States

The Australian National University — Canberra
Bachelor of Science (Advanced) (Honours) — 2019–2022
- Majors: Astronomy and Astrophysics, Computer Science
- Minor: Mathematics
- Honours: Astronomy and Astrophysics
- GPA - 6.781/7

Homebush Boys High School — Sydney
Year 10 to Year 12 (HSC) — 2016–2018

Research Experience

The Australian National University — Feb 2022 - Nov 2022
Honours in Astronomy and Astrophysics at RSAA
- Characterising variability in AGN lightcurves to search for Changing-Look AGN.
- Identified Changing-Look AGN candidates based on deviations from expected flux variability in lightcurves.
- Analysed spectra from different epochs to confirm candidates that changed AGN type.

ARC Centre of Excellence for Engineered Quantum Systems (EQUS) — Dec 2020 - Feb 2021
Summer Research Scholarship
- Low-temperature electromagnetic characterisation of crystals and defects.
- Developed an autonomous pipeline to analyse data obtained from Vector Network Analyser.
- Implemented peak-finding and Fano-resonance fitting algorithms to the data, to obtain quality factor of crystals.

The Australian National University — Jul 2020 - Oct 2020
Undergraduate Astrophysics Research Project
- Finding young stellar associations with Chronostar.
- Adapted Chronostar code base to model stellar associations as ellipsoids.

Other Undergraduate Projects

High Performance Computing — 2021
High Performance Scientific Computation course (ANU)
- Molecular Dynamics and Cloth Simulation
- Programmed vectorised and parallel C/C++ algorithms to run on NCI-Gadi supercomputer and analysed run times.

LIGO Data Analysis
Physics Second Year Lab (ANU) — 2020

- Identified the GW150914 gravitational wave signal in a data record provided by the LIGO collaboration.
- Performed signal filtering and noise whitening using python.

Chaotic Motion
Physics Second Year Lab (ANU) 2020

- Simulated a non-linear oscillator that exhibits chaotic dynamics
- Numerically solved Duffing equation using python.

Thermal Diffusivity Simulation 2020
Thermal and Statistical Physics course (ANU)

- Computed thermal diffusivity on a 2D material using Daniel V. Schroeder's "Interactive Molecular Dynamics" simulation.
- Modified the simulation using JavaScript and HTML.

Skills

- **Programming Languages:**
  - **Python -** Data analysis, various numerical simulations, basic machine learning
  - **C/C++ -** High performance scientific computation
  - **Java -** Android development, game development
  - **Haskell -** Simple AI
- **Technical Software:** Unix shell (bash/zsh), Mathematica, MATLAB, LaTeX, Git, TOPCAT, QFitsView
- **Other Software:** Blender

Tutoring Experience

Indigenous Tuition Program Apr 2023 - Jun 2023
The Australian National University

- One-on-one tutoring undergradauate students.
- Courses: ASTR1003, PHYS1001

Extracurricular Activities

- ANU Societies and Clubs 2019-2022
  Past treasurer of ANU Fighting Games Club.
  Past member of ANU Physics society, ANU Astronomy society, ANU Boardgames club.
- High School Volunteering 2017-2018
  50 Hours of volunteering which included organising events such as multicultural day and graduation.
- Peer Tutoring 2017
  Tutored new high school students as a part of TAFE Peer Tutoring Program
- Breakfast Club 2016–2017
  Served breakfast weekly for a small number of students and staff at Homebush Boys High School