Sujay Shankar

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Education

The University of Texas at Austin **August 2020 – December 2023**
Bachelor of Science: Astronomy *Major GPA: 3.8927*
Bachelor of Science: Computational Physics *Major GPA: 3.9058*
Certificate: Elements of Computing *Certificate GPA: 4.0000*

Boston University **September 2024 – present**
Doctor of Philosophy: Astronomy

Research Projects

The University of Texas at Austin | McDonald Observatory **May 2022 – August 2023**
Undergraduate Research Assistant *Austin, TX*

- Lead developer of the `gollum` Python library, analyzing and visualizing stellar and substellar atmosphere models
- Software architecture improvements, UI/UX improvements, and bug fixes
- Added support for starspot two-component mixture modeling with PHOENIX
- Tested functionality on IGRINS spectra

The University of Texas at Austin | Department of Astronomy **August 2023 – December 2023**
AST 375C: Conference Course in Astronomy *Austin, TX*

- Lead developer of `blase3D`, a fork of `blase` (Gully-Santiago & Morley 2022)
- Used interpretable machine learning with GPUs to clone PHOENIX spectra across T_{eff}, $\log(g)$, and [Fe/H]
- Used linear interpolators to create manifolds mapping stellar properties to line-by-line properties

The University of Florida | Department of Astronomy **May 2023 – present**
REU Student Researcher *Gainesville, FL*

- Synthesized a globular cluster escapee sample from APOGEE DR17 and GALAH DR3, combined with Gaia dynamics
- Developed a multithreaded orbit integration pipeline with Monte Carlo initial conditions
- Used chemical, dynamical, and photometric information to match escapee candidates with globular clusters

The University of Texas at Austin | Department of Astronomy **January 2024 – July 2024**
Research Engineering/Scientist Assistant *Austin, TX*

- Added `gollum` support for newly released Sonora Diamondback brown dwarf atmospheric models
- Improved `gollum`'s documentation, setup, testing, and directory management systems
- Submitted papers for `blase3D` to ApJ and `gollum` to JOSS

Publications

- **Shankar, S.** & Gully-Santiago, M. & Morley, C. 2024 (in review) *A New Hybrid Machine Learning Method for Stellar Parameter Inference.* ApJ
- **Shankar, S.** & Bandyopadhyay, A. & Ezzeddine, R. (in prep) *Novel Dynamical Tagging of Globular Cluster Escapee Candidates back to their Sources.*
- **Shankar, S.** et al. 2024 (in review) *`gollum`: An intuitive programmatic and visual interface for precomputed synthetic spectral model grids.* JOSS

Technical Skills

Languages: Python, Bash, MATLAB, LaTeX, Swift
Frameworks: Pandas, Altair, Numpy, Astropy, PyTorch, Galpy
Technologies: VSCode, Git, Linux, XCode, GPU Computing

Conferences

American Astronomical Society 243rd Meeting **January 2024**
– Poster: *Novel Dynamical Tagging of Globular Cluster Escapee Candidates back to their Sources* *New Orleans, LA*
2023 Bash Symposium **October 2023**
– Poster: *Precision Fundamental Stellar Properties with Interpetable Machine Learning* *Austin, TX*
TACCSTER 2023 **October 2023**
– Attendee Only *Austin, TX*

Presentations

Dynamically Tagging Globular Cluster Escapee Candidates back to their Sources **August 2023**
Generating Rotational Velocities for 27 Near-IR Objects **May 2023**