

# Sujay Shankar

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🌐 [github.com/Sujay-Shankar](https://github.com/Sujay-Shankar)

## Education

### The University of Texas at Austin

*Bachelor of Science: Astronomy*

*Bachelor of Science: Computational Physics*

*Certificate: Elements of Computing*

August 2020 – December 2023

Major GPA: 3.8927

Major GPA: 3.9058

Certificate GPA: 4.0000

### Boston University

*Doctor of Philosophy: Astronomy*

September 2024 – present

## 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  $T_{\text{eff}}$ ,  $\log(g)$ , and  $[\text{Fe}/\text{H}]$
- 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*

- Add `gollum` support for newly released Sonora Diamondback brown dwarf atmospheric models
- Improve `gollum`'s documentation, setup, testing, and directory management systems
- Submit 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, L<sup>A</sup>T<sub>E</sub>X, 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 Interpretable 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