

# Sujay Nair

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[Personal Website](#), [Google Scholar](#), snair303@gatech.edu, US Citizen

- EDUCATION**      **Georgia Institute of Technology**, Atlanta, GA      2022-2026  
*Double Major*: B.S. in Computer Science; B.S. in Mathematics; (Cum. GPA 3.9/4.0)  
*Honors*: Deans Scholarship for College of Sciences, Faculty Honors
- EXPERIENCE**      **Undergraduate Researcher**      Summer 2024-Present  
*MIT Earth Intelligence Lab*, Cambridge, MA  
Advisors: Dr. Evan Coleman, Prof. Sherrie Wang  
Training neural networks to infer geological properties of soil using hyperspectral remote sensing anchored by field measurements. Publications at AAAI 2026, Nature (planned).
- Undergraduate Research Intern**      Fall 2023-Present  
*MIT Climate & Sustainability Consortium*, Cambridge, MA  
Advisors: Dr. Evan Coleman, Prof. Elsa Olivetti  
Training neural networks to infill mineral presence and infer soil organic carbon; applications in carbon capture and mineral discovery. Publications at ICLR Climate Workshop 2024, AAAI 2026.
- Machine Learning Intern**      Summer 2023  
*Fifth Set Analytics*, San Francisco, CA  
Trained neural networks for automated foul calling/refereeing for basketball building on pre-trained pose estimation models (MMPOSE, MMDetection).
- Undergraduate Research Assistant**      Spring 2023  
*Georgia Tech Robot Learning and Reasoning Lab*, Atlanta, GA  
Advisor: Prof. Danfei Xu  
Developed methods for human hand-tracking for Franka robot arm using RealSense D435 camera and pre-trained hand pose estimation models.
- Research Intern**      Summer/Fall 2021  
*NASA Jet Propulsion Lab (JPL)*, Pasadena, CA  
Advisor: Dr. Kyle Pearson  
Trained convolutional neural networks to detect 5000+ Extrasolar Planet transits and recurrent neural networks to predict 4 planetary parameters (RP/RS, A/RS, Period, Mid-transit Time), poster at American Astronomical Society.
- Student Researcher**      2019-2022  
*NASA Exoplanet Watch*  
Advisors: Dr. Rob Zellem, Dr. Kalee Tock  
Updated exoplanet transit properties using light curve data, numerous publications/posters at astronomy conferences.

**HIGHLIGHTED RESEARCH**      **Sujay Nair**, Evan Coleman, Sherrie Wang. Earth2EMIT: Spatiotemporal autoencoders for orbital-proximal fusion. *Nature (Planned)*.  
Building all-in-one soil property prediction pipeline using NASA EMIT hyperspectral satellite data fused with geospatial data, atmospheric data, and high-quality field

measurements from YardStick PBC. We use a physics-guided autoencoder that learns spectral-spatial embeddings to reconstruct the soil spectra and predict soil properties.

**Sujay Nair**, Evan Coleman, Elsa Olivetti, Sherrie Wang. Masked Mineral Modeling: Continent-scale mineral prospecting via geospatial infilling.

Trained a U-net ResNet to infill the presence of masked minerals based on surrounding mineral resources, geophysical data (fault lines, elevation, rocktype, etc), and agronomic data (RaCA). Model outperformed ViT and Kriging with test dice coefficient of 0.31. *Association for the Advancement of Artificial Intelligence (AAAI) 2026*. [Paper](#)

Evan Coleman, **Sujay Nair**, Xinyi Zeng, Elsa Olivetti. Structured spectral reconstruction for scalable soil organic carbon inference. *International Conference on Learning Representations (ICLR) Tackling Climate Change with Machine Learning Workshop 2024*. [Paper](#)

Used USDA RaCA data to reconstruct SOC spectra alongside SOC regression to improve model generalization out of distribution. Also used a physics-based reconstruction pipeline to provide an interpretable spectral signature of SOC and avoid generalization failures through fine-tuning.

**Sujay Nair**, Caroline Scolari, Jay Kelath, Aishwarya Rammohan, Richard Ozer, Gloria Ng, Wesley Chang, Pat Boyce. Citizen Scientist Transit and Comparison Star Analysis of HATS-4 b with the East Bay Astronomical Society. *American Astronomical Society (AAS) 237*. [Paper](#)

Mentored 6 citizen scientists from the East Bay Astronomical Society to use the EXOplanet Transit Interpretation Code and study transit timing inaccuracies of exoplanet HATS-4 b.

## HONORS & AWARDS

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|---|----------------|
| <b>Deans Scholarship for College of Science</b> , Georgia Tech  | 2022-2026      |
| <b>Deans List</b> , Georgia Tech  | 2022-Present   |
| <b>Faculty Honors</b> , Georgia Tech  | 2022,2023,2025 |
| <b>Betty Neall Youth Award of Merit</b> , East Bay Astronomical Society   | 2021           |
| <b>1st Place</b> , Washington State Science and Engineering Fair  | 2021           |
| <b>Wolfram Research Award</b> , Washington State Science/Engineering Fair   | 2021           |
| <b>NASA Earth Sciences Award</b> , Washington State Science/Engineering Fair  | 2021           |
| <b>Select Interview for the Research Notes of the American Astronomical Society</b> , American Astronomical Society | 2020           |
| <b>President's Award for Educational Excellence</b>   | 2019           |

## TECHNICAL SKILLS

**Programming** - Python (PyTorch, Numpy), R, Java, C, C++, x86/LC3 Assembly  
**Technologies** - AWS, GCP, GitHub, JavaFX  
**Concepts** - Machine Learning, Computer Systems, Object Oriented Programming, Data Structures and Algorithms, Astrophysics/Cosmology, Geophysics

## PUBLICATIONS & PREPRINTS

[13] **Sujay Nair**, Evan Coleman, Sherrie Wang. Earth2EMIT: Spatiotemporal autoencoders for orbital-proximal fusion. *Nature (Planned)*.

[12] **Sujay Nair**, Evan Coleman, Elsa Olivetti, Sherrie Wang. Masked Mineral Modeling: Continent-scale mineral prospecting via geospatial infilling. *Association for the Advancement of Artificial Intelligence (AAAI) 2026*. [Paper](#)

[11] Evan Coleman, **Sujay Nair**, Xinyi Zeng, Elsa Olivetti. Structured spectral reconstruction for scalable soil organic carbon inference. *International Conference on*

*Learning Representations (ICLR) Tackling Climate Change with Machine Learning Workshop 2024.* [Paper](#)

[10] **Sujay Nair**, Kyle Pearson. Using Deep Learning with Phase Folded Light Curves to Detect Exoplanets. *American Astronomical Society (AAS) 237.* [Abstract](#)

[9] **Sujay Nair**, Caroline Scolari, Jay Kelath, Aishwarya Rammohan, Richard Ozer, Gloria Ng, Wesley Chang, Pat Boyce. Citizen Scientist Transit and Comparison Star Analysis of HATS-4 b with the East Bay Astronomical Society. *American Astronomical Society (AAS) 237.* [Paper](#)

[8] **Sujay Nair**. Transit Analysis of TOI 1780.01. *ExoDem 2020 Caltech.* [Poster](#)

[7] **Sujay Nair**. Mid-transit and Reference Star Analysis of HAT-P-37 b and Kepler-45 b. *Exoplanet3 Heidelberg*

[6] **Sujay Nair**, Jonathan Varghese. Transit Analysis of Exoplanets TrES-5b and WASP-43b. *Research Notes of the American Astronomical Society (RNAAS), 236th American Astronomical Society (AAS), Oral Session - Extrasolar Planets III: Transits and Populations.* [Paper](#)

[5] **Sujay Nair**, Krithi Koodli, Elliott Chalcraft, Kalee Tock. Analysis of Candidate Exoplanet TOI717.01 and Confirmed HAT-P-3b. *SAS.* [Paper](#)

[4] **Sujay Nair**, Jonathan Varghese, Kalee Tock, Robert Zellem. Analysis of HAT-P-23b, Qatar-1b, WASP-2b, and WASP-33b with an Optimized EXOplanet Transit Interpretation Code. *Published and Presented: Society for Astronomical Sciences (SAS)* [Paper](#)

[3] Ryan Caputo, ..., **Sujay Nair**, ... Investigation of 14 Wide Common Proper Motion Doubles. *Published: Journal of Double Star Observations (JDSO).* [Paper](#)

[2] Robert Zellem, ..., **Sujay Nair**, ... Utilizing Small Telescopes by Citizen Scientists for Transiting Exoplanet Follow-Up. *Published: Publications of the Astronomical Society of the Pacific (PASP).* [Paper](#)

[1] Quinn Perian, **Sujay Nair**, Kalee Tock. Freshening Exoplanet Transit Midpoints. *235th Meeting of the American Astronomical Society (AAS), 2020 CubeSat Workshop.* [Poster](#)