

Snigdaa Sethuram

 Snigdaa Sethuram |  snigdaa.ram@gmail.com

EDUCATION

Ph.D. Physics Georgia Institute of Technology, Atlanta, GA	August 2019 - Present
M.S. Physics Georgia Institute of Technology, Atlanta, GA	Summer 2020
Certificate in Data Science Rutgers University Trilogy Education, Piscataway, NJ	September 2018 - June 2019
B.S. Astrophysics Rutgers University, New Brunswick, NJ	May 2018

RESEARCH & TECHNOLOGY EXPERIENCE

Graduate Research Assistant Spring 2020 - Present

Advisor: Dr. John Wise

Center for Relativistic Astrophysics, School of Physics, Georgia Institute of Technology

- Developed a machine learning model to emulate star formation and feedback algorithms during simulation runtime, implemented in the astrophysical software ENZO
 - * Currently speeds up simulation runtime by 2 orders of magnitude, in active development
 - * Received NASA FINESST Fellowship to investigate this work
- Simulated and explored high-redshift galaxy signatures with and without central active galactic nuclei to constrain and explain initial James Webb Space Telescope results
- Created mock observations of high-redshift galaxies and created probability distribution functions of galactic properties in order to inform James Webb Space Telescope observations

Pre-doctoral Fellow August 2021 - January 2022

Advisors: Dr. Chris Hayward and Dr. Rachel Cochrane

Center for Computational Astrophysics, Flatiron Institute, New York, NY

- Created a neural network to predict spectral energy distributions of galaxies in the IllustrisTNG50 simulation, a highly studied and commonly used simulation when studying galactic properties
 - * Model is expandable to other simulations with similar physical prescriptions and galaxy properties
- Published code for public use to be adapted to individual simulations for most accurate predictions

Undergraduate Research Assistant August 2015 - August 2018

Advisors: Dr. Rachel Somerville and Dr. Ena Choi

Department of Physics, Rutgers University

- Analyzed low-redshift spiral galaxies and obtained mock observations using radiative transfer code Powderday
- Created half-light and half-mass profiles using mock observation images to determine a trend in mass-to-light ratios and eventually use stellar luminosity and mass to determine host dark matter halo mass
- Received High Honors on transcript for capstone thesis work

National Science Foundation (NSF) Research Experience for Undergrads Summer 2016

Advisor: Dr. Stephen Zepf and Dr. Mark B. Peacock

Department of Physics & Astronomy, Michigan State University

- Performed photometric analysis on the Virgo Galaxy Cluster (VGC) using Source Extractor and IRAF
- Queried the Hubble telescope and the Sloan Digital Sky Survey (SDSS) SQL database for data from VGC's right ascension and declination range and thoroughly cleaned the data for our needs
- Compared the 'identical' filters of SDSS and Hubble telescopes and determined a gradient between the two, indicating that there are errors to be accounted for when combining or comparing data from the two telescopes

Engineering Manager August 2015 - May 2018

Rutgers University Television Network

Piscataway, NJ

- Trained 10 engineers and 16 production members, managed 6 engineers at any one time
- Facilitated new methods to streamline communication between engineering and production teams, increasing production output by 3 broadcast-length shows per week
- Installed servers and fiber system across Rutgers campus and in-studio for higher broadcast speeds and data transfer rates between studio recording and live output
- Chief engineer for live shows produced by RUTV

PUBLICATIONS

Vincent A Horvath, **Snigdaa S Sethuram**, John H Wise, *Predicting Stellar Masses of the First Galaxies Using Graph Neural Networks*, Research Notes of the American Astronomical Society, Volume 8, April 2024

Snigdaa S Sethuram, Rachel K Cochrane, Christopher C Hayward, Viviana Acquaviva, Francisco Villaescusa-Navarro, Gergö Popping, John H Wise, *Emulating radiative transfer with artificial neural networks*, Monthly Notices of the Royal Astronomical Society, Volume 526, Issue 3, December 2023, Pages 4520-4528

Ben C Sherwin, **Snigdaa S Sethuram**, John H Wise, *Predicting the UV Escape Fraction of the First Galaxies in the Renaissance Simulations with Machine Learning*, Research Notes of the American Astronomical Society, Volume 7, November 2023

Corey Brummel-Smith, Danielle Skinner, **Snigdaa S Sethuram**, John H Wise, Bin Xia, Khushi Taori, *Inferred galaxy properties during Cosmic Dawn from early JWST photometry results*, Monthly Notices of the Royal Astronomical Society, Volume 525, Issue 3, November 2023, Pages 4405-4425

Desika Narayanan, Matthew J Turk, Thomas Robitaille, Ashley J Kelly, B Connor McClellan, Ray S Sharma, Prerak Garg, Matthew Abruzzo, Ena Choi, Charlie Conroy, Benjamin D Johnson, Benjamin Kimock, Qi Li, Christopher C Lovell, Sidney Lower, Georgia C Privon, Jonathan Roberts, **Snigdaa Sethuram**, Gregory F Snyder, Robert Thompson, John H Wise, *POWDERDAY: Dust Radiative Transfer for Galaxy Simulations*, The Astrophysical Journal Supplement Series, 252, 12, 2021

TEACHING EXPERIENCE

PHYS 2212 - Intro Physics II: Electricity and Magnetism - Lab Spring 2020

PHYS 2211 - Intro Physics I: Mechanics - Recitation Fall 2019

Physics, Math, and Python Tutor with Varsity Tutors August 2018 - August 2019

Tutored high school and college students over semester-long periods of time in math, physics, and python coding. Notable moments: Helped one student increase grade in Differential Equations from D to B+ in one semester; assisted a student in programming a game eventually bought by an indie startup

Teaching Assistant at Rutgers University Science Bus August 2016 - February 2018

Developed physics lesson plans and demos for 4th grade students in school districts near New Brunswick without a well-developed science curriculum, and was present during these lessons as an assistant teacher

HONORS & AWARDS

NASA Future Investigators in NASA Earth and Space Science and Technology Fellowship August 2022

Amelio Travel Award February 2022

Pre-doctoral Fellow at the Flatiron Institute's CCA Fall 2021

High Honors in Astrophysics, Rutgers University Spring 2018

School of Arts and Sciences Honors Scholar at Rutgers University 2014 - 2018

Top 3 Poster Presenter at APS CUWiP in Princeton January 2017

PROFESSIONAL ACTIVITIES

First Stars and Galaxies VII in NYC Attendee and Poster Presenter Spring 2024

International High Performance Computing Summer School Student Summer 2023

ENZO Days Conference Attendee May 2023

European Astronomical Society 2022 Conference Attendee and Poster Presenter July 2022

From Stars to Galaxies III Conference Attendee and Poster Presenter June 2022

GT Judicial Committee Jury Member August 2021 - August 2022

GT Graduate Student Diversity Council Member Fall 2019

OUTREACH

Physics Allies for Wellness Founder and Mentor	Fall 2022 - Present
Graduate Association of Physicists Mentorship Program - Mentor	Fall 2021 - Present
Astronomy on Tap Series Presenter for Rutgers University	December 2022
Atlanta Science Festival Volunteer	March 2021, March 2022
National Black Physicist Conference GT School of Physics Graduate Liaison/Recruiter	November 2022

LEADERSHIP AND SERVICE

Conference for Undergraduate Women in Physics Organizing Committee Co-lead Spring 2023 - Spring 2024

- Planned and executed the regional 2024 Conference for Undergraduate Women in Physics at Georgia Tech for over 200 attendees and volunteers
- Coordinated speakers, workshops, and panels while managing schedules, finances, regional team's inbox, and slack workspace for conference weekend
- Delegated tasks among the regional team while prioritizing goals and regulations laid out by the national committee

Physics Allies for Wellness (PAW) Co-Founder and Mentor Fall 2022 - Present

- Built the constitution and guidelines for PAW mentors and laid the groundwork for communication infrastructure via email, website and Slack
- Worked with the Diversity, Equity, and Inclusion committee as well as the chair of the School of Physics to make data collection as a PAW mentor transparent and practical
- Acted as a mentor to graduate and undergraduate students for both academic and personal issues
- Completed Safe Space, Implicit Bias, and QPR training

Graduate Association of Physicists President Summer 2021 - Spring 2022

- Facilitated the graduate mentor program, ensuring incoming first-year students were each paired up with a senior graduate student in the department
- Assembled and presented talks for first-year students on picking advisors, communicating with course instructors, thinking about a path through the PhD and using school resources, and resolving interpersonal issues with their peers
- Budgeted, planned, and executed weekly social events, monthly career events, and semesterly listening sessions

Graduate Association of Physicists Vice President Summer 2020 - Spring 2021

- Innovated virtual spaces for students to gather and interact or study together due to campus being closed for the pandemic
- Contributed to action plan proposals for the DEI committee regarding fair treatment of students, reparations to minority groups, and best practices for teaching assistants and professors
- Created new social and career events for graduate students to attend virtually or in person
- Manually created database of approximately 50 physics alumni from Georgia Tech and their contact information

MENTORED STUDENTS

Vincent Horvath Georgia Institute of Technology, Atlanta, GA July 2022 - April 2024
Early graduate currently employed at IBM

Benjamin Sherwin Georgia Institute of Technology REU Student Summer 2023
NSF GRFP Recipient and current grad student at Stanford

SKILLS

Scripting & Data Communications	Python, Bash, JavaScript, Fortran, SQL, CSS, HTML, Tableau, Heroku
Operating Systems	Unix/Linux, Windows Powershell
Vocational Tech	High Performance Computing, Cluster account management, Automation pipelining, ML designing/architecting, large data storage and transfer
Communication and Leadership	Technical Presentations, Public Speaking, Technical/Research Papers, Committee Planning and Leading, Project Manager, Panel Moderation, Panel Participation
Collaborative Platforms	Github, Slack, Discord, Microsoft Teams, Zoom, BlueJeans