Austen **Gabrielpillai**
Curriculum Vitae (iD)

Astrophysics Science Division, Code 665, 8800 Greenbelt Rd, Greenbelt, MD, 20771

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Education

Rutgers University - New Brunswick
Master of Information

New Brunswick, NJ
Sep. 2018 - May 2020

- Concentration in Data Science

University of Illinois at Urbana-Champaign
B.S. in Engineering Physics

Urbana, IL
Aug. 2013 - May 2017

- Concentration in Computer Science

Professional Appointments

NASA Goddard Space Flight Center / Catholic University of America
Research Assistant

Goddard, MD
Nov. 2020 - Present

- Under the supervision of James Rhoads and Sangeeta Malhotra, funded by the CRESST II cooperative agreement.
- Developing instrument simulation and data processing pipelines in Python and Jupyter Notebooks for Roman Space Telescope preparation.
- Optimizing and parallelizing code using multiprocessing and numba for running simulations on high-performance computing clusters.
- Investigating the time evolution of physical properties and thier residuals between bijectively matched galaxies in two catalogs.

Center for Computational Astrophysics / Flatiron Institute
Research Analyst

New York, NY
Jul. 2018 - Aug. 2020

- Part- / full-time internship under the supervision of Rachel Somerville as a member of the Galaxy Formation group.
- Conducted galaxy formation research comparing Santa Cruz SAM and IllustrisTNG simulation outputs at $z = 0$.
- Developed a Python module for querying and loading partitions of a 180 GB simulation suite.
- Created a browser tool that enables real-time transformations of over 4 million simulated galaxies using Three.js and D3.js graphics.

GSI Helmholtz Center for Heavy Ion Research
Undergraduate Research Assistant

Darmstadt, DE
May 2016 - Aug. 2016

- Full-time internship under the supervision of Zoran Andelkovic and Wilfried Nörtershäuser as a member of the Atomic Physics group.
- Directed high-energy ion beams along 100 meters of beam line as part of a facility wide development project.

Research Interests

I am a trained data scientist transitioning into astrophysical research by applying simulation techniques to study the formation and evolution of galaxies across cosmic time. I have generated galaxy catalogs using a semi-analytic model for galaxy evolution, as well as synthetic wide-field survey images with simulation code built from the ground up. My aim is to use my unique educational and professional background to create and develop tools and data products that will be publicly available to the greater astronomy community.

Volunteer & Community Involvement

University of Illinois Black Chorus
General Member (2015-2017) & Service Team (2017)

Urbana, IL
Jan. 2015 - May 2017

- Managed technical aspects such as audio and visual media set up of the biennial symposium conference as Technology Manager.
- Coordinated a 6-person infrastructure team to assist with stage preparation, set up, and take down.

Skills

Programming	Python (fluent), JavaScript (proficient), HTML & CSS (proficient), C (familiar), C++ (familiar), SQL (familiar)
Software	Jupyter Notebook, PyCharm, Microsoft Visual Studio, Adobe Photoshop, Github, Overleaf
Linux Computing	System Commands, Vim, Bash, Slurm, MPI

Publications

FIRST AUTHOR

2021, *Galaxy Formation in the Santa Cruz semi-analytic model compared with IllustrisTNG – I. Galaxy scaling relations, dispersions, and residuals at z=0*
GABRIELPILLAI, AUSTEN; SOMERVILLE, RACHEL S.; GENEL, SHY; RODRIGUEZ-GOMEZ, VICENTE; PANDYA, VIRAJ; YUNG, L. Y. AARON; HERNQUIST, LARS

In Review

arXiv:2111.03077

CO-AUTHOR

2021, *Galaxy assembly bias and large-scale distribution: a comparison between IllustrisTNG and a semi-analytic model*
HADZHIYSKA, BORYANA; LIU, SONYA; SOMERVILLE, RACHEL S.; **GABRIELPILLAI, AUSTEN**; BOSE, SOWNAK; EISENSTEIN, DANIEL; HERNQUIST, LARS

MNRAS, 508, 698

arXiv:2108.00006

Talks & Presentations

CONFERENCE TALKS

"Roman Grism Simulations with Multiple Orders and Distortions"
ROMAN SCIENCE TEAM COMMUNITY BRIEFING - SELECTED TALK

Virtual
Nov. 2021

"Mock Grism Simulations for Roman Space Telescope"
THE 238TH AAS MEETING - SELECTED TALK

Virtual
Jun. 2021

DEPARTMENT TALKS

"Roman Grism Simulations with Multiple Orders and Distortions"
NASA GODDARD EARLY CAREER SCIENTIST FORUM - SELECTED TALK

Virtual
Nov. 2021

"Comparing galaxy properties between IllustrisTNG and the Santa Cruz SAM at z=0"
NASA GODDARD EARLY CAREER SCIENTIST FORUM - LIGHTNING TALK

Virtual
Nov. 2021

References

Sangeeta Malhortra
sangeeta.malhortra@nasa.gov
- Research Astronomer at NASA Goddard Space Flight Center's Astroparticle Physics Laboratory
- Collaborator on Roman Space Telescope preparatory work

James Rhoads
james.e.rhoads@nasa.gov
- Research Astronomer at NASA Goddard Space Flight Center's Observational Cosmology Laboratory
- CRESST II sponsor
- Collaborator on Roman Space Telescope preparatory work

Rachel Somerville
rsomerville@flatironinstitute.org
- Galaxy Formation Group Leader at Center of Computational Astrophysics, Flatiron Institute
- Internship advisor
- Main collaborator for the Santa Cruz Semi-analytic model vs. IllustrisTNG paper series

Shy Genel
sgenel@flatironinstitute.org
- Associate Research Scientist at Center of Computational Astrophysics, Flatiron Institute and Adjunct Associate Research Scientist at Columbia University
- Collaborator on projects related to IllustrisTNG

Michael Lesk
lesk@comminfo.rutgers.edu
- Professor of Library and Information Science at Rutgers University - New Brunswick
- Independent study supervisor