Kaila Nathaniel

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Education:

2022 – present	**PhD in Astrophysical Sciences and Technology** (AST) Rochester Institute of Technology (RIT) Advisor: Richard O'Shaughnessy	Rochester, NY
2022	**MS in Astrophysics**, University of Bonn Thesis: "Spindown and envelope inflation of massive main sequence stars in the Milky Way", Advisor: Norbert Langer	Bonn, Germany
2019	**BS in Physics**, minors in Math and Astronomy, *magna cum laude* Virginia Polytechnic Institute and State University (Virginia Tech)	Blacksburg, VA

External Experience:

2023 – present	**LSSTC Data Science Fellow**, LSST Corporation
2024	**McFacts Hack Week 2024**, Center for Computational Astrophysics NYC, NY.
2023	**Kavli Summer Program in Astrophysics**, Max Planck Institute for Astrophysics Garching, Germany. Project Advisor: Alejandro Vigna-Gómez. *Effect of rejuvenated accretors on the population of Thorne-Żytkow Objects*
2019	**Advancing Theoretical Astrophysics Summer School** Anton Pannekoek Institute for Astronomy, University of Amsterdam (The Netherlands)
2018	**LIGO Summer Undergraduate Research Fellow**, California Institute of Technology Pasadena, CA. Project Advisor: Brittany Kamai. Poster, SACNAS 2018: *Could a seismic cloak help LIGO?*
2017	**International REU Student**, School of Physics and Astronomy University of Birmingham, United Kingdom. Project Advisor: Ilya Mandel. *Chemically homogeneous evolution: a rapid population synthesis approach*
2016 – 2017	**Nancy Grace Roman Space Telescope Winter Intern** NASA Goddard Space Flight Center, Greenbelt, MD.

Awards and Honors:

2023	**LSSTC Data Science Fellowship**	LSSTC Data Science Fellowship Program
2023	**Kavli Summer Program Fellowship**	Kavli Foundation
2023	**Opportunity Fellowship**	AST/New York Space Grant Consortium
2019	**MS Honors Scholarship**	Bonn-Cologne Graduate School
2019	**Ladies of Robeson Award**	Department of Physics, Virginia Tech
2018	**Sigma Pi Sigma Honor Society Inductee**	Department of Physics, Virginia Tech

Skills:

Software & Tools:	McFACTS, MESA, COMPAS, GitHub, LaTeX, HTML
Computer Languages:	Python (numpy, scipy, matplotlib, pandas, etc.), Bash, FORTRAN, Java, C++
Human Languages:	English (Native), German (B2)

Publications:

"Spindown of massive main sequence stars in the Milky Way"
Nathaniel, K., Langer, N., Simón-Díaz, et al. 2024. *In prep.*

"McFACTS I: Testing the LVK AGN channel with Monte Carlo For AGN Channel Testing & Simulation (McFACTS)"
McKernan, B., Ford, K.E.S., et al., (8 authors, including **Nathaniel, K.**). 2024. *Submitted to ApJ.*

"Population synthesis of Thorne-Żytkow objects"
Nathaniel, K., Vigna-Gómez, A., Renzo, M., et al. 2024. *Submitted to A&A.*

"Detailed models of interacting short-period massive binary stars"
Sen, K., Langer, N., Marchant, P., et al., (13 authors, including **Nathaniel, K.**). 2022. *A&A*, 659, A98

"Chemically homogeneous evolution: a rapid population synthesis approach"
Riley, J., Mandel, I., Marchant, P., et al., (8 authors, including **Nathaniel, K.**). 2021. *MNRAS*, 505, 663-676

"Multi-messenger Observations of a Binary Neutron Star Merger"
Abbott, B. P., et al., (3538 authors, including **Nathaniel, K.**) . 2017. *ApJ*, 848, L12

Conference Presentations and Invited Talks:

Population synthesis of Thorne-Żytkow objects: rejuvenated donors and unexplored progenitors. AMNH Seminar Series. Sept. 2024. Invited talk.

Population synthesis of Thorne-Żytkow objects. APS April Meeting. April 2024.

TŻOs can be found: Population synthesis of Thorne-Żytkow objects. COMPAS Team Call. Nov. 2023.

Spindown and envelope inflation of massive main sequence stars in the Milky Way. RIT AST Lunch Talk. January 2023.

Teaching Experience:

2022 – 2023 Graduate Teaching Assistant, RIT
Stars and Galaxies PHYS 104
Stellar Astrophysics AST 370

2020 – 2022 Graduate Teaching Assistant, University of Bonn
Stellar Structure and Evolution ASTRO 811
Nucleosynthesis in Stars ASTRO 858

2017 – 2018 Learning Assistant, Virginia Tech: General Physics I PHYS 2205

Outreach and Service Experience:

2023 – present Pen Pal, Letters to a Pre-Scientist (*Science outreach to middle school students*)
2023 – present Secretary/Treasurer for American Physical Society, RIT Chapter
2023 – present Board Member, Doctoral Student Association, RIT
2023 – present AST Program Mentor, RIT (*Mentor to four first-year AST PhD students*)
2023 – present Imagine RIT Exhibit Leader (*University-wide community outreach*)
2024 Graduate Representative, AST Admissions Committee, RIT
2023 Executive Secretary, NASA Proposal Review Panel
2022 Activity Leader, RIT Observatory Open House for Girl Scout Troop 61046
2021 – 2022 Volunteer for Astronomy on Tap Bonn. Bonn, Germany
2018 – 2019 Student Representative, Department of Physics Undergraduate Committee. Virginia Tech.