

Kaila Nathaniel

kjn9240 AT rit DOT edu

kailanathaniel.com

ORCID ID: [0000-0003-2430-9515](https://orcid.org/0000-0003-2430-9515)

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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, <i>magna cum laude</i> 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. <i>Effect of rejuvenated accretors on the population of Thorne-Żytkow Objects</i>
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: <i>Could a seismic cloak help LIGO?</i>
2017	International REU Student , School of Physics and Astronomy University of Birmingham, United Kingdom. Project Advisor: Ilya Mandel. <i>Chemically homogeneous evolution: a rapid population synthesis approach</i>
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:

Computer Languages: Python, Bash, FORTRAN, Java, C++

Software & Tools: McFACTS, MESA, COMPAS, GitHub, L^AT_EX, HTML

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.

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.