Koen Schenck

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Summary Statement

Enthusiastic and motivated astrophysicist, driven toward extrapolating the most obscure and significant mysteries of our universe, particularly how neutrinos can help understand the origin of the universe.

Core Qualifications

- Strong background in computational astrophysics and statistical analysis
- Experience with large-scale observational datasets(NASA Exoplanet Archive, Pantheon+, GAIADR3)
- Skilled in independent and collaborative research and technical writing.

Education

Florida Institute of Technology, BS in Astronomy and Astrophysics — August 2022 – May 2026 (Expected)

- Honors: Dean's List 2022, 2024, 2025
- Relevant Coursework: Astrophysics I, Quantum Mechanics, Quantum Computing, Nuclear Physics

Experience

Undergraduate Research Assistant, Florida Tech – Melbourne, FL — August 2024 – Present

- Developed planetary system models with MESA (Modules for Experiments in Stellar Astrophysics) using Python and FORTRAN.
- Contributed to the design and maintenance of the project pipeline, ensuring efficient data flow and reproducibility.
- Generated visualizations and diagnostics with MATLAB to interpret simulation results.

Space Coast Olympic Fencing Club Manager and Coach, – Rockledge, FL — January 2023 – Present

- Curate, execute, and lead fencing classes from beginner to advanced levels in two primary fencing weapons: epee and foil.
- Create and support a safe and welcoming environment for students to learn new fencing skills for recreation and competition.
- Organize club and local tournament events.

Publications

Manuscript in Review — Submitted September 2025

Schenck, K., *Chen, H.*. "Magnetic Amplification of Photoevaporation: Coupled Dynamo and Ohmic Heating in Hot Saturns." *Submitted to Icarus*.

Projects

Magnetic Amplification of Photoevaporation: Coupled Dynamo and Ohmic Heating in Hot Saturns

- Simulated the internal structure and evolution of 60-100 Earth-mass exoplanets using MESA (Modules for Experiments in Stellar Astrophysics.
- Advanced previous magnetic dynamo models in MESA to evaluate ohmic dissipation as a mechanism driving radial inflation in exoplanets.
- Analyzed and interpreted large astrophysical data sets to support the development of a new physical theory.
- Designed clear, publication-ready visualizations in Python and MATLAB to illustrate theoretical and

computational results.

- Collaborated with the lead advisor to coordinate project scope, programming tasks, and research timeline.
- Prepared and formatted the manuscript submission using LaTeX, ensuring professional presentation for journal review.

Senior Capstone Project: CMD Assessment of M42 August 2025-Present

- Utilize Python programming to analyze Nebulae data collected from GAIADR3 and SDSS (Sloan Digital Sky Survey).
- Goal: Assess fits images collected from observations of M42.
- Tools Used: Python programming, GAIA DR3, SDSSR19, and SkyNet.

Expansion of Pantheon+SHOES via Neutrino "anchor" June 2025-Present

- Assessed the viability of imposing a neutrino anchor within the Pantheon+ dataset through simulations to constrain cosmological constants.
- Outlined future work extending this framework to propagate IceCube and JUNO neutrino data through the Pantheon+ covariance matrix.
- Employed the Pantheon+SH0ES Data Release as the primary dataset for analysis.

Leadership Experience

President and Coach of the Florida Tech Fencing Cluub, Florida Tech – Melbourne, FL August 2024 – Present

- Founded and established the FIT Fencing Club in August 2024.
- Design and teach structured classes twice per week, developing athletes' skills and fostering team cohesion.
- Lead outreach and marketing efforts, growing membership through tabling events, social media campaigns, and on-campus engagement
- Coordinate logistics for practices, competitions, and events, including securing facilities, equipment, and funding and donations.
- Coordinated Volunteer opportunities within Brevard County, including Barrier Island Sanctuary.
- Mentor and support members by creating a welcoming, inclusive team culture that emphasizes both performance and community.

Relevant Skills

Programming Languages: Python, FORTRAN, R, MATLAB
Astronomy Tools: MESA, Astropy
Visualization: Matplotlib