

Ananda F. Smith

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EDUCATION

Massachusetts Institute of Technology Ph.D. in Physics	2025 – Present
Case Western Reserve University (CWRU) B.S. Mathematics and Physics with Astronomy secondary major <i>Summa cum laude</i>	2021 – 2025

RESEARCH EXPERIENCE

Cosmic Topology , Undergraduate Researcher <i>Supervised by Craig Copi & Glenn Starkman</i> Computed cosmic microwave background temperature and polarization correlations induced by primordial gravitational waves in universes with non-orientable spatial topologies.	Sep 2024 – May 2025
Magnetized Shocks from Neutron Star Mergers , Caltech WAVE Fellow <i>Supervised by Elias Most</i> Modeled shock from collapsing magnetar propagating through ejecta by performing relativistic magnetohydrodynamic simulations in AthenaK framework.	Jun 2024 – Aug 2024
Spatially Anisotropic Cosmologies , Undergraduate Researcher <i>Supervised by Craig Copi & Glenn Starkman</i> Derived fluctuations in cosmic microwave background temperature in spacetimes with anisotropic Thurston geometries. Strongly constrained curvature parameter $ \Omega_K \lesssim 10^{-5}$ in all five of these spacetimes.	May 2023 – Sep 2024

PUBLICATIONS

A. F. Smith, C. J. Copi, G. D. Starkman. *Cosmological constraints on anisotropic Thurston geometries.* [JCAP 01 \(2025\) 005 \[arXiv:2409.03008\]](#).

TALKS

CWRU Physics Department Senior Symposium , Cleveland, OH “Gravitational waves in non-orientable universes.”	Apr 2025
CERCA Seminar , Cleveland, OH “Cosmological constraints on anisotropic Thurston geometries.”	Oct 2024
Caltech SFP Summer Seminar Day , Pasadena, CA “Numerical Modeling of Shock-Powered Transients from Neutron Star Mergers.”	Aug 2024
Penn State Neighborhood Workshop on Astrophysics and Cosmology , State College, PA “Constraining Cosmic Anisotropic Curvature.”	Apr 2024

POSTERS

APS Global Physics Summit , Anaheim, CA “Cosmological constraints on anisotropic Thurston geometries.”	Mar 2025
Intersections Research Symposium , Cleveland, OH “Cosmological constraints on anisotropic Thurston geometries.”	Dec 2024
SpaceVision Research Symposium , Washington, DC “Constraining Curvature in Kantowski-Sachs Spacetimes.”	Nov 2023
APS Eastern Great Lakes Section Meeting , Cleveland, OH “Constraining Curvature in Kantowski-Sachs Spacetimes.”	Oct 2023

HONORS & AWARDS

Polykarp Kusch Prize for best physics senior thesis CWRU Department of Physics	2025
Jason J. Nassau Prize to outstanding seniors in astronomy CWRU Department of Astronomy	2025
Intersections Research Symposium Award , 1st place in Physical Sciences category CWRU Undergraduate Research Office	2024
Donald A. Glaser Award to outstanding mathematics and physics students CWRU Department of Physics	2024
Richard L. Garwin Award for service and scholarship in physics CWRU Department of Physics	2024
Sigma Pi Sigma Recognition CWRU Sigma Pi Sigma Chapter	2023
Junior/Senior Scholarship Case Alumni Association	2023
Deans High Honors CWRU Office for Undergraduate Studies	2021–2025

LEADERSHIP & SERVICE

Physics Department Undergraduate Program Committee <i>B.S. Math and Physics Student Representative</i> Advised undergraduate program requirements and course offerings.	Oct 2023 – May 2025
Society of Physics Students (SPS) <i>Vice President, Treasurer</i> Reinitiated SPS and instated Sigma Pi Sigma Honor Society CWRU chapters. Awarded 2022-23 Notable Chapter and 2023-24 Outstanding Chapter by SPS National.	Apr 2023 – Dec 2024
Students for the Exploration and Development of Space <i>Treasurer, Secretary</i> Promoted professional development and facilitated networking opportunities by hosting speakers from NASA Glenn Research Center and local start ups. Organized club transportation and raised funds for annual SpaceVision conference.	Nov 2021 – May 2024
Women in Physics and Astronomy Club <i>Secretary</i> Organized and conducted monthly Q&A sessions with Physics Department colloquium and seminar speakers. Re-started, managed, and created promotional graphics for club social media.	Feb 2022 – Apr 2023