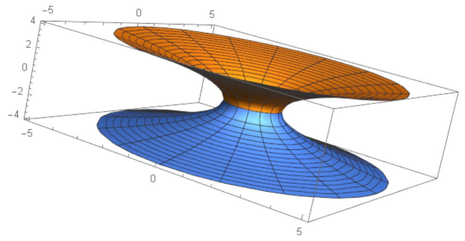
COS Honors – Physics Thesis
Michael Gardner, Physics, 2020

Intellectual Achievement and Research

SUMMARY

I will complete a year-long thesis physics thesis research project in order to earn COS honors distinction this May. Supervised by Dr. Lopez-Mobilia, my thesis is the culmination of all my specific efforts made during the last three years and demonstrates my commitment to future PhD research. Having previously studied cosmology, general relativity, and Mathematica programming I chose to create a physics education tool that helps to visualize the connection between the mathematics of wormholes and their geometry. My goal was to prepare myself for graduate research by spending a year learning about something that made me go into physics, wormholes. I worked independently to develop my theoretical and computational research.



SPICES

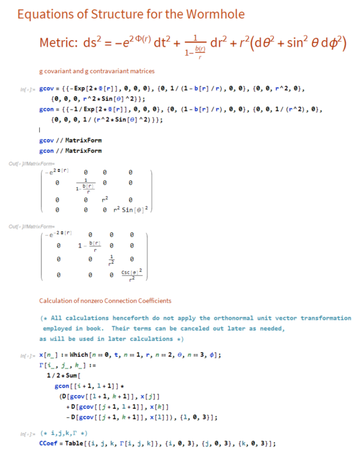
A senior research thesis is self-evidently an embodiment of Intellectual Achievement and Research. My thesis is the product of my scientific curiosity and will be the legacy of my undergraduate work.

HERBS

My thesis is honorable in that it provides me with research distinction among my future peers and is supportive to the education of physics students.

LEARNING OUTCOMES

My thesis project strove to increase my own engagement and wonder at advanced physics while doing the same for future students. I had to use intellectual dexterity to adapt multiple sources into a coherent project and figure out how to visualize their ideas. I was creatively courageous to create my own thesis and see it through. My project management skills were greatly tested and improved during my work; I had to learn how to break up the project into manageable pieces to be completed incrementally.



IMPACT

This project significantly impacted me by exposing me to a few of the realities of theoretical physics. I will be starting a PhD degree shortly, and attempting advanced undergraduate research provided me with valuable experience and learning opportunities for how to perform better. I am always astonished to see how deep physics knowledge goes and how little I still know. I look forward to seeing the impact my project has as a physics education tool to students in the future after I leave it in the hands of Dr. Lopez-Mobilia to assist in teaching general relativity.

ADVICE

Pick a topic you are interested in and a research advisor you work well with. Begin early during your sophomore/junior years by cultivating your knowledge in a specific area. Use your time wisely and make slow steady progress.