

# MAX ORTNER

*contact@maxortner.com*

## EDUCATION

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### **Belmont University**

Overall GPA: 3.76

President of the Society of Physics Students

*August 2019 - Present*

Graduation Date: December 2023

## WORK EXPERIENCE

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### **Various Tutoring**

*January 2020 - May 2020 & November 2022-Present*

- Began tutoring Calculus I for credit in my freshman year of college
- Put tutoring at forefront this year in an effort to concentrate my attention towards physics and mathematics, primarily focusing on fundamentals

### **Math and Science Learning Center**

*August 2020 - May 2021*

- Worked for university to provide tutoring services to students for mathematics both online for a duration and in person
- Upheld rigorous health and safety standards during the pandemic

### **Kitchen and Restaurant Work**

*May 2021 - November 2023*

- Worked every position at a Red Lobster all the way up to becoming a certified restaurant supervisor where I managed the staff, restaurant in general, and handled money
- Led the line and cooked at a up-scale dining restaurant called Del Friscos

## RESEARCH EXPERIENCE

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### **Mathematics and Physics**

Received award for three semesters of research conducted in topics of differential equations (categorizing various equations and studying equations of the stochastic type)

- Summer Undergraduate Research Fellowship in the Sciences (SURFS) at Belmont university during the summer of 2021 where the application of geometric algebra in undergraduate physics education was discussed

### **Independent Pursuit**

I have most of my person projects on display on my github page. These, for the most part, are centered around graphics programming (OpenGL and Vulkan) and creating user-oriented and performant graphics frameworks.

I also have pursued higher topics in physics than are typically offered in an undergraduate course. These include classical field theory as well as quantum field theory (mainly gauge theory and differential geometry). I also am well versed in differential equations and group theory.

## RELEVANT LINKS

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- *GitHub:* <https://www.github.com/maxortner01>

*Website:* <https://www.maxortner.com>

*LinkedIn:* <http://www.linkedin.com/in/max-ortner>

References supplied on request.

## TALKS & CONFERENCES

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### **Behavior of the Airy Equation**

*April 2021 at BURS (Belmont University)*

- Various properties (concavity, stationary points, etc.) were investigated about the Airy equation  $y'' = xy$ .

### **Geometric Algebra for Physics**

*June 2021 at SURFS (Belmont University)*

- The mathematical framework of geometric algebra and the benefits of this framework in an undergraduate education on physics was given as a poster presentation.

### **Stochastic Differential Equations**

*November 2021 at BURS (Belmont University)*

- Conducted an overview of general stochastic differential equations and programmed basic simulations to show how introducing stochastic elements into a traditional constant acceleration equation can introduce unpredictable factors into a physical model.

### **Properties of a Nonlinear Differential Equation**

*April 2022 at BURS (Belmont University)*

- My mentor and I studied the behavior of a kind of nonlinear, first-order differential equation,  $y' = -xy^3 + a$ , determining various properties such as concavity and stationary points.

### **Methods of Generative Audio Synthesis**

*April 2023 at BURS (Belmont University)*

- Here is discussed a possible way to perform generative audio synthesis by using a learning model to approximate a manifold upon which the data exists (UMAP). The manifold provides one with an invertible map, which gives a robust way to use the embedding space to “go back into the sound space.”

Presentation can be supplied upon request.