

Physics Senior Thesis Presentations

Program for June 4, 2024

3:00pm - Peter J. Orndoff (advisor Dr. Jeffrey Hazboun)

"Visualizing the Gravitational Wave Background generated by Supermassive Black Hole Binaries using gw_sky"

Speaker Biography: Peter is graduating with a degree in Computational Physics with a minor in Computer Science and Mathematics. During his time at OSU he conducted gravitational wave research with Dr. Jeffrey Hazboun. After graduation, Peter will be attending the International Pulsar Timing Array Conference in Milan, Italy and then work for Dr. Hazboun to research supermassive binary black hole positioning using dark matter power spectra. In the fall he plans on attending the University of Milan to pursue a Master's degree in Astrophysics.

3:12 pm - Connor Haley Miles (advisor Brian Woods)

"System for Targeted Reactivity using Farnsworth-Hirsch Inertial Reactor Experiment(STARFIRE)"

Speaker Biography: Connor Haley Miles is graduating with a Bachelor of Science in Applied Physics with a minor in Nuclear Engineering. During their time as an undergraduate, they worked under Dr. Brian Woods on a fusion reactor. They will be attending the University of Illinois Urbana-Champaign in pursuit of a Master of Engineering degree in Plasma Engineering. They plan to continue the development of fusion technology in industry or pursue a PhD and conduct research on plasma and fusion energy.

3:24 pm - Audra Lein (advisor David Craig)

"A Review of Probable Dark Matter Candidates"

Speaker Biography: Audra Lein is graduating from Oregon State University with a Bachelor of Science in Physics and a minor in mathematics. Audra plans to enter industry and eventually attend a graduate program to continue studies in the future.

3:36 pm - Haley Richter (advisor Bo Sun)

"The Mechanics of Invading Tumor Spheroids in Aligned Extra-Cellular Matrix"

Speaker Biography: Hailey Richter is graduating with a Bachelor of Science in Computational Physics and a minor in computer science. During her time as an

undergraduate, she finished a NASA STARR grant under Dr. Xavier Siemens on the uses of gravitational waves in researching astrological phenomena. She also spent a year working under Dr. Bo Sun on the invasion patterns of breast cancer cells. After graduating, Hailey will be attending the University of Notre Dame in pursuit of a Biophysics Ph.D.

3:48 pm - Hannah O'Meara (advisor Bo Sun)

"Slowing Metastasis: Temperature Testing of MDA-MB-231 Breast Cancer Carcinoma Cells"

Speaker Biography: Hannah O'Meara is graduating from Oregon State University with a Bachelor of Science degree in Physics, with an option in Biology. She has aspirations to continue working in research labs and one day pursue a Ph.D. in Biophysics after taking some time off to be a mom. Her dream is to one day work in a lab in OHSU or Johns Hopkins.

4:00 pm – Clare Swartz

4:12 pm – Audrey Nelson (advisor Xavier Siemens)

"Sifting Through Radio Telescope Observations in Search of Millisecond-Period Pulsars"

Speaker Biography: Audrey Nelson is graduating with a Bachelor of Science in mathematical physics and a minor in mathematics. Audrey did research for NANOGrav as an undergraduate and plans to get an engineering-based job before pursuing a graduate degree.

Physics Senior Thesis Presentations

Program for June 11, 2024

<https://oregonstate.zoom.us/j/98740352032?pwd=3cjwB7aUTsZmZaDeZqIPGOFTQ1ldwO.1>

3:00 pm – Richard Freeman (advisor Ethan Minot)

“Interactive Visualization of Crystal Lattices and Momentum Space for Electronic Structure Calculations”

Speaker Biography: Richard Freeman is graduating with a Bachelor's in general Physics from OSU this Spring. After school, he plans to work at a pipe warehouse in his hometown of Albany, recover his sanity, and figure out what is happening next. He is also planning on working as a substitute teacher at the Chesterton Academy classical high school starting up this Fall in Corvallis.

3:12 pm – Vincent Vaughn-Uding (advisor Rebecka Tumblin)

Remote presentation

3:24 pm - Ty Zuber (advisor Bo Sun)

"Physically modeling simplistic lattices: Testing the fibrous nature of extracellular matrices"

Speaker Biography: Ty Zuber is graduating from Oregon State University with a Bachelor of Science degree in physics with a Minor in economics. He grew up in Bend, Oregon where he attended Summit High School. He plans to take a gap year before applying for graduate school in aerospace engineering and eventually work in industry.

3:36 pm - Jackson Gessner (advisor Vanessa Polito)

"Understanding the Lower Atmosphere Counterpart of Active Region Outflows with IRIS"

Speaker Biography: Jackson Gessner is graduating from Oregon State University with a Bachelor of Science degree in physics. He grew up in Bend, Oregon where he attended Bend Senior High and Central Oregon Community College. He will be attending the University of Oregon in pursuit of the Masters Internship program in optical physics beginning June 2024.

3:48 pm – Joey Takach (advisor Markus A. Luty, UC Davis and David Craig)

“Hamiltonian Truncation Applied to Lattice ϕ^4 Theory”

Speaker Biography: Joey Takach is graduating with two Bachelors of Science degrees in physics and mathematics. He conducted undergraduate research with Dr. David Craig at OSU, and then with Dr. Markus Luty at UC Davis working on numerically studying quantum field theories. After graduation, he will be attending UC Berkeley for his PhD program where he plans to study high-energy particle phenomenology.

4:00 pm – David Hannahs-Jackson (advisor Kathryn Hadley)

“Coupling Effects for Self-Gravitating Polytropic Star-Disk Systems | Spatially Resolved Star Modeling. A linear analysis”

David Hannahs-Jackson will be receiving a Bachelor of Science degree in Physics from Oregon State University. After 10 years in the fastener distribution industry, they chose to pursue their life-long dream of becoming a scientist. Before attending OSU, David completed an A.A. at Spokane Falls Community College in 2019 and in 2008 graduated from Valley Christian High School in Spokane Washington. Upon graduation, they plan to continue their research with Dr. Hadley in stellar accretion disk formation. David’s interests lie in material science, specifically in superconducting nanomaterials as well as in quantum gravitational research.

Talks presented to Honors College

Ian Busby (advisor Davide Lazzati)

"On the Relationships between Light Curve and Spectral properties of Time-Resolved Gamma-Ray Bursts"

Speaker Biography: Ian Busby is an undergraduate at Oregon State University studying physics with minors in mathematics and history. He will be continuing his time at Oregon State for a fifth year in the fall. His research focused on gamma-ray bursts with the Lazzati Theoretical and Computational Astrophysics Group. He plans to apply to PhD programs throughout summer and fall of 2024 and graduate in 2025.

Sophia "Phia" Morton (advisors Xavier Siemens [OSU], Stefano Rinaldi [University of Pisa], and Walter Del Pozzo [University of Pisa])

"GW190521: *A binary black hole merger inside an active galactic nucleus?*"

Speaker Biography: Phia Morton is graduating from Oregon State University with an Honors Bachelor of Science in physics with the applied physics option and a minor in nuclear engineering. During her time as an undergrad, she worked on a variety of research projects including with Xavier Siemens in the NANOGrav group at OSU, Ingrid Stairs at the University of British Columbia, and Brian Woods in the nuclear engineering department at OSU, as well as many public outreach efforts through her leadership roles in the Astronomy Club and Society of Physics Students. She completed her thesis research at the University of Pisa in the summer of 2023, also published as a paper in Physical Review D. Upon graduating she will begin her Ph.D. at Stanford University.