Physics Senior Thesis Mini-Conference

June 3rd and 10th, 2025 in Weniger 328

All students and faculty invited to attend

Students Presenting on Tuesday, June 3

3:30pm - **Kyle Gourlie** (research mentor Jeffrey Hazboun)

> "Variance in Pulsar Timing Sensitivity Due to the Uncertainty in the Gravitational Wave Background"
>
> *Kyle Edward Gourlie is graduating from Oregon State University with a Bachelor of Science degree in physics, with a minor in mathematics. He is a first-generation college student from Scio, Oregon where he attended Linn-Benton Community College and earned his Associates in Science degree concurrently in high school. At community college, Kyle performed research on developing telescope hardware automation for the Modern Arthur Eddington Experiment of 2024 with Heather Hill and Austyn Moon. During his time as an undergraduate at OSU, he conducted research under Dr. Jeffrey Hazboun on pulsar timing detector characterization and lead the NANOSTARs undergraduate research group under Dr. Xavier Siemens. Kyle was the Society of Physics student Vice President, President, and Treasurer during his three years at Oregon State, as well as the Treasurer for Physicists for Inclusion in Science. After graduation Kyle will be pursuing his PhD in physics at the University of Wisconsin-Milwaukee, and plans to continue to perform research in the field of gravitational-wave astrophysics.*

3:42pm - **James Nelson** (research mentor Oksana Ostroverkhova)

> "Light-matter Interactions in a Naturally Derived Fungal Semiconductor"
>
> *James Nelson is an undergraduate at OSU double majoring in physics and mathematics. He is slated to graduate this Spring and subsequently begin pursuing a PhD in physics at Temple University in the Fall. With a focus on condensed matter physics, he hopes to continue teaching and doing research after graduate school as a professor.*

3:54pm - **Miller Nelson** (research mentor Ethan Minot)

> "Implementing a MoS_2-WSe_2 Heterojunction as a Spectrometer"
>
> *Miller Nelson is a third year undergraduate studying physics and mathematics with a minor in spanish. During his time in the physics department, he has researched in the Quantum Electronics lab and worked as an LA for the majority of the Paradigms in Physics sequence. Having wanted to be a physicist since the 5th grade, Miller dreams of a career in physics academia working in solid state and condensed matter fields where he can teach and continue to do meaningful research.*

4:06pm - **Natalie Rodgers** (research mentor Vanessa Polito)

> "Pre-Flare Oscillations in Line Broadening: Signatures of Turbulence in Solar Transition Region"
>
> *Natalie Rodgers is graduating with a degree in physics and a minor in mathematics from Oregon State University. Originally from Sweet Home, Oregon, she attended high school there before continuing her studies at OSU. During her time at OSU, Natalie has been actively involved in the Society of Physics Students, Physicists for Inclusion in Science, and the Astronomy Club. She plans to pursue a PhD in physics at OSU this fall, with the ultimate goal of advancing her education and conducting research.*

4:18pm - **Scott Shapton** (research mentor Elizabeth Gire)

> "Construction of a System of Coupled Classical Resonators for Band Formation Demonstration"
>
> *Scott has been working on his undergraduate degree for far too long, and has already found great joy in science instruction at Outdoor School programs and OMSI. He looks forward to having time to finish setting up his own workshop and potentially make science demonstration equipment in the off season.*

Students Presenting on Tuesday, June 10

3:30pm - **Katie Alice Siegfried** (research mentor Tim Zuehlsdorff, Chemistry)

> "Excited State Mixing and Vibronic Coupling through Adiabatic and Non-adiabatic Theoretical Spectroscopic Calculations in Indole"
>
> *Katie Siegfried is graduating from OSU with Bachelor's in both Physics and Chemistry. Originally attending Oberlin Conservatory as a music student, she transferred to OSU to fulfill a lifelong love of science in her home state. After graduation she will be pursuing a PhD in Physical Chemistry from Brigham Young University in Utah, studying THz generation materials and nonlinear spectroscopy.*

3:12pm - **Jaden Baran-Kamoura (they/he)** (research mentor Heidi Schellman)

> "Generator Studies for Prompt Phi(1020) Meson Production at $\sqrt{s}_{NN}$ = 68.5 GeV in pNe Collisions at LHCb."
>
> *Jay is graduating with a Bachelor of Science in Mathematical Physics and a minor in Mathematics from Oregon State University. During their undergraduate studies, they conducted research in particle physics at the University of Cagliari in Sardegna, Italy, focusing on prompt Φ(1020) meson production at the Large Hadron Collider. Their work involved developing a holistic simulation to investigate quark-gluon plasmas. After graduation, Jay will pursue a Master of Science in Physics with a focus on Quantum and Nanotechnology at the University of Oregon. Outside of physics, they plan to become a part-time PADI dive instructor.*

3:24pm - **Marty Weigel** (research mentor Nick Siler, Atmospheric Science)

> "Thermodynamic and dynamic influences on hydrologic extremes"
>
> *Marty Weigel is graduating with dual bachelor's degrees in Physics and Sociology with a minor in Math. He performed research in Nick Siler's lab, focusing on understanding the manner in which the hydrologic cycle will change under a warming climate. He is planning to take his knowledge and skills built during his time at Oregon State University to industry for a time before returning to school to continue his physics education at a graduate program.*

3:36pm - **Keegan Bailey-Darland** (research mentor Yun-Shik Lee)

> "Non-Linear Terahertz Pump-Probe Study on the Photoconductivity of Multilayer MoS_2"
>
> *Keegan Bailey-Darland is graduating with a Bachelor of Science in Physics and Math. He conducted research with Dr. Yun-Shik Lee in terahertz spectroscopy and plans to pursue a career in optics.*

3:48pm - **Cody Worrell** (research mentor Yun-Shik Lee)

> "Studying nonlinear photocarrier dynamics in Multilayer MoS_2 using Terahertz Time Domain Spectroscopy"
>
> *Cody Worrell is graduating with a bachelors in Physics and a minot in Chemistry. His research is studing the nonlinear dynamics of photo excited electrons in MoS_2 for further material characterization and further adpatations using this materail. His intrersts are in material science and solid state physics, with interest in the production of semiconductors. Cody Worrell is from Eugene Oregon is a first generation college student. Before coming to OSU he transferred from Lane Community College realizing that physics is what he wanted to study. After OSU he is planning on attending the University of Oregon in the Knight Masters Internship Program in the semiconductor track.*

4:00pm - **Nathan Duggan** (research mentor Oksana Ostroverkhova)

> "Microcavity photonics of the fungus derived pigment Draconin Red"
>
> *Nathan Duggan is an undergraduate student at OSU graduating in June 2025 with a Bachelor of Science in Physics. During his time at OSU he conducted research studying organic molecules with Oksana Ostroverkhova. He is attending University of Oregon's graduate internship program in the summer with an interest in semiconductor research.*

4:12pm - **Nathan Hastings** (research mentor Bo Sun)

> "The Mechanics of Engineering Collagen Matrices"
>
> *Nate is graduating with a Bachelor of Science in Physics, having conducted biophysics research with the Bo Sun Lab. He is exploring career opportunities in cancer research in Denver, Colorado. In the meantime, he plans to move to his family’s property in the Washington Cascades to focus on his ultramarathon career. He would like to thank Bo Sun, Austin Naylor, and Max Libbman for their support with his research, and his family and friends for the love and encouragement they provided throughout his degree.*

4:24pm - **Johannes Huurman** (research mentor Axel Saenz Rodriguez, Mathematics)

> "Analyzing Topological Solitons in the Kitaev Spin Chain using Density Matrix Renormalization Group"
> (WIC Culture of Writing Award Winner)
>
> *Johannes Huurman is graduating with a Bachelor of Science in Mathematics and Physics. During his time as an undergraduate, he conducted research with Dr. Axel Saenz Rodriguez in the Mathematics department working on spin chains. After graduating, Johannes will be pursuing a PhD at NCSU in theoretical soft matter physics, with hopes to continue doing research in the future.*

4:36pm - **Owen Mau** (research mentor Xavier Siemens)

> "Pulsar Candidate Search and Analysis for Gravitational Wave Detection"
>
> *Owen Mau is an undergraduate at OSU, graduating with a degree in Physics and a minor in Mathematics. He will be continuing his studies at the University of Oregon, pursuing a master's degree in Applied Physics, specializing in semiconductors.*

4:48pm - **Mateo Hall** (research mentor Meenakshi Rao, Portland State University)

> "Analysis of Extreme Formaldehyde and Nitrogen Dioxide Columns in Oregon Caused by the Beachie Creek Fire"
>
> *Mateo Hall is graduating with a Bachelor of Science in Physics from Oregon State University. Before attending OSU, he spent a year at Clackamas Community College in his hometown of Oregon City, Oregon. He will continue his academic journey in the accelerated master's program in Semiconductor Physics at the University of Oregon. Mateo aspires to pursue a Ph.D. to further his commitment to education and research. As a first-generation college student, he recognizes both the privilege and importance of higher education and is eager to continue on this path.*

Other Students Completing Thesis

Josh Anderson (research mentor Sieun Chae, Electrical Engineering and Computer Science)

> "Exploring the p type conductivity of Beta Platinum Oxide"
> (WIC Culture of Writing Award Honorable Mention)
>
> *Josh Anderson is an undergraduate at OSU studying Physics with a chemistry concentration. During his time at OSU, Josh has been involved in undergraduate research under the direction of Sieun Chae, a professor in the ECE department. His research involves DFT (Density Functional Theory) first principles calculations of materials, with a particular emphasis on p-type metal oxides. Josh aspires to continue this area of research in his graduate studies.*

Phoebe I. Andromeda (research mentors Heidi Schellman and Alan Poon, Lawrence-Berkeley National Laboratory)

> "TransistorDataVisualizer: A Python Library for the Characterization of the Graphene Field-Effect Transistor"
>
> *Phoebe Andromeda is graduating with a Bachelor's in computational physics and a minor in computer science. She completed her thesis on her work at Lawrence-Berkeley National Laboratory (LBNL). Post graduation, she intends to pursue a career in industry.*

Josiah Chan (research mentor Oksana Ostroverkhova)

> "Fabrication and Optical Characterization of 2D Magnetic Layers of CrSBr, $FePS_3$, and CrSBr/Organic Heterojunctions"
>
> *Josiah is from Portland, Oregon and will graduate in June 2025 with an Honors Bachelor of Science in Physics with a Mathematics option and minor. After graduation, he will attend the optics track of the University of Oregon's Knight Campus Graduate Internship Program, an accelerated Master's program.*

Madalyn Gragg (research mentor Oksana Ostroverkhova)

> "Elucidating Structure-Property Relationships Enabling Singlet Fission Processes for Optoelectronic Applications"
>
> *Madalyn Gragg is graduating with an Honors double major in Mechanical Engineering and Applied Physics and served as a lead undergraduate researcher in the Organic Photonics and Electronics Group lead by Professor Oksana Ostroverkhova. She contributed to two co-authored publications, with much of this work forming the basis of her Honors thesis. Madalyn will pursue a Ph.D. in Physics at the University of Texas at Austin, where she will join a group investigating light-matter interactions in transition metal dichalcogenides and multiferroic materials using advanced spectroscopic techniques.*

Roan Luikart (research mentor Nicholas Marshall, Mathematics)

> "Momentum-Based Acceleration of the Randomized Kaczmarz Algorithm"
>
> *Roan Luikart is graduating with a Bachelor of Science in Mathematics and Physics. As an undergraduate, Roan conducted research on stochastic iterative methods (thesis) and mathematical biology (REU). After graduation, Roan will pursue a Ph.D. in Mathematics at the University of Virginia, with the goal of ultimately becoming a mathematics professor.*

Miranda Seghers (research mentors Evan Thatcher and Elizabeth Gire)

> "As X Changes What Happens to Y?: How Students Use Covariational Reasoning on Written Homework in an Introductory, Algebra-based Physics Course"
>
> *Miranda is graduating with a B.S. in physics and music. During her undergrad, Miranda worked in various educator roles across ten physics courses and one math course as a lab instructor, homework grader, learning assistant, and supplemental instruction leader. This summer, she begins her M.S. in Science Education. While pursuing their graduate degree, Miranda plans to continue working in Corvallis School District. After teaching high school physics for several years, she would like to return to university for a PhD in Physics to do more PER research.*

Alexander Tubby (research mentors Heidi Schellman and Catalina Curceanu, Isstituto Nazionale di Fisica Nucleare)

> "Calibrating Silicon Drift Detectors for Data Subsets of the VIP-2 Experiment: A Search for Violations of the Pauli Exclusion Principle"
>
> *Alex Tubby is working towards his Honors Bachelor degree in Physics with a minor in Mathematics. He conducted research for this thesis via a summer fellowship at a national nuclear physics laboratory in Frascati, Italy. Alex is pursuing further coursework and new research opportunities at Oregon State for the next academic year, and intends on pursuing graduate school for a PhD in physics. He is passionate about making a cleaner, more energy efficient future.*

Logan Winder (research mentor Matthew Graham)

> "Density of States Characterization: An Evaluation of C-V and Photoconduction Methods"
>
> *Logan Winder is receiving an Honors Bachelor of Science in Physics in June 2025. He grew up in West Linn, Oregon, and came to Oregon State University to study physics. At Oregon State, Logan joined the Micro-Femto Energetics lab, headed by Professor Matthew Graham, and spent time researching thin-film transistors. Logan plans to enter the industry and wants to gain some real-world experience before attending a graduate program.*