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### College of Science

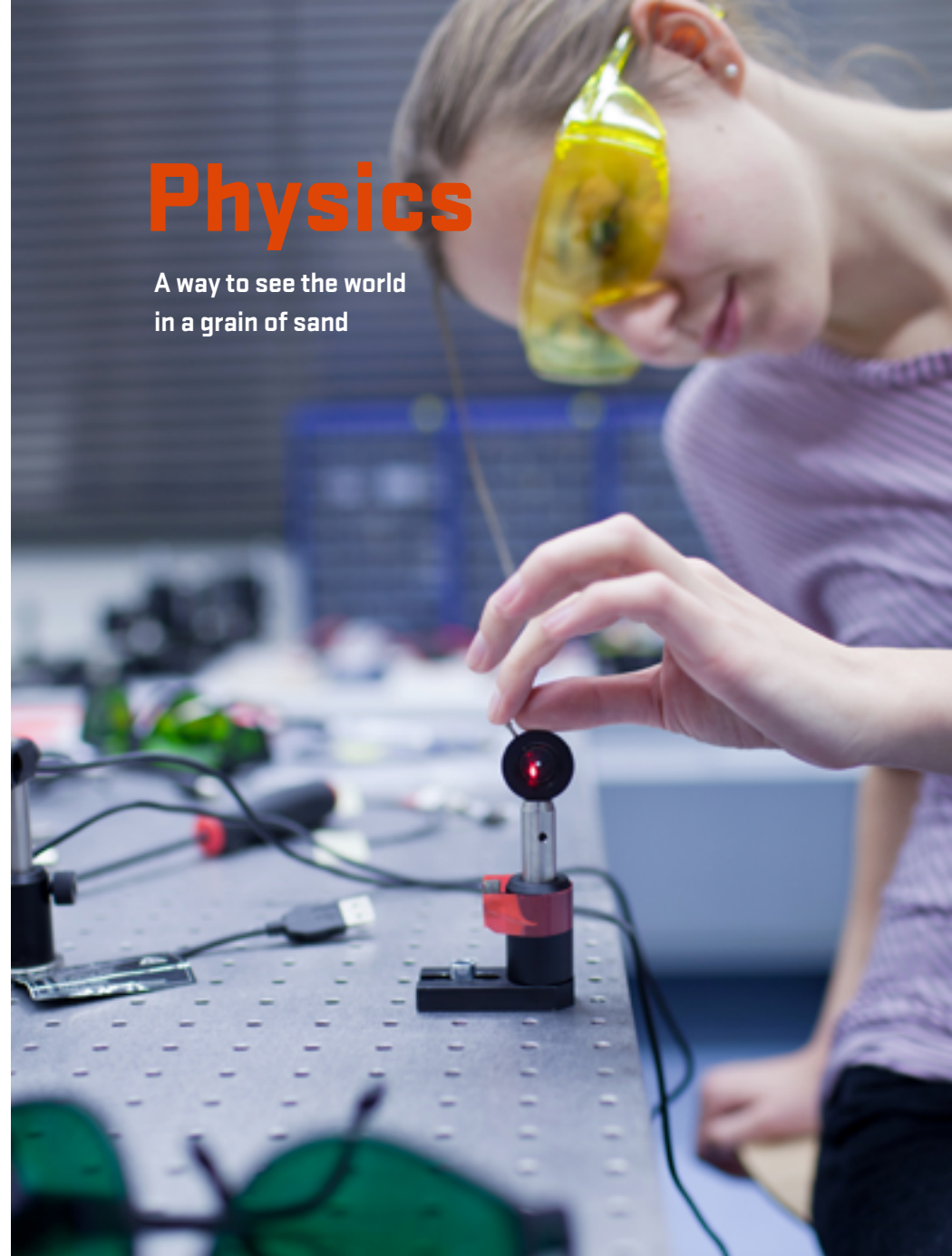
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# Physics

A way to see the world  
in a grain of sand

**COLLEGE OF SCIENCE**  
ACADEMIC BROCHURE



## Physics is different at Oregon State

The Department of Physics at Oregon State has world-class faculty, an illustrious tradition of research and teaching excellence and impressive laboratories to enhance undergraduate learning. OSU physics research is fundamental to the development of leading technologies, such as transistors, semiconductors, superconductors and magnetic resonance imaging.

The quality of our program reflects our commitment to undergraduate education. The department offers both undergraduate (B.S. and B.A.) and advanced degrees and has strong research programs in astrophysics, biophysics, condensed matter physics, optical physics, particle physics and physics education.

In 2018, the American Physical Society selected OSU's Department of Physics as one of three top universities for improving undergraduate physics education.

### Student success

Students receive faculty advising to support their goals, guide their academic progress and keep them on track for graduation. For current course requirements, refer to OSU's General Catalog online. For information about careers and graduate programs, contact the Physics Department.



### Highlights

- Our students don't just study physics, they learn to think like physicists.
- Students gain hands-on experience working in labs using high-tech instrumentation and gaining the lab techniques necessary for a smooth transition to their careers.
- All students complete a physics thesis project under the mentorship of a physics professor, a deeply immersive and rewarding experience giving students phenomenal skills and often leading to published papers and conference presentations.
- In 2014, Intel hired all of our physics graduates who were seeking employment.

## **Transformative power of research**

The value of undergraduate research cannot be overstated. Through research, students learn to balance collaborative and individual work as well as explore different career paths. On-the-job experience working with teams is a highly sought after skill in any workplace. Students who participate in undergraduate research deepen their critical thinking skills and academic experience, and have a chance to interact one-on-one with faculty.

Physics students work on collaborative and original research projects with faculty in the areas of theoretical and experimental physics, including astrophysics, biophysics, condensed matter physics, optical physics, particle physics and physics education. These rigorous experiences are pivotal to the professional success of our graduates.

Our undergraduates collaborate on interdisciplinary projects within the College of Science, across OSU and at internships in private companies and national laboratories.

## **Innovative curriculum**

Students gain interdisciplinary, cutting-edge and core physics skills and preparation through multiple degree options, such as Applied Physics and Computational Physics.

Supported by National Science Foundation funding, the physics program features a best-in-class, nationally recognized Paradigms in Physics curriculum. Starting in 1997, faculty have reinvented the way undergraduate students learn physics by combining hands-on learning in state-of-the-art labs with innovative educational technologies.

Students gain a fresh approach to physics that emphasizes using computers to solve complex mathematical problems and visualize results.



## Sample curriculum

### YEAR ONE

Physics  
Calculus  
Chemistry  
Biological science  
General course: Difference,  
Power & Discrimination  
*Study abroad*

### YEAR TWO

Classical Mechanics  
Calculus & Differential Equations  
Linear Algebra  
Physics of Contemporary  
Challenges  
General course: Institutions  
& Social Change  
*Summer research*

### YEAR THREE

Electronics Laboratory  
Paradigms in Physics  
Computer Interfacing  
General course: World Views  
and Environmental Values  
*Internship*

### YEAR FOUR

Electromagnetism  
Thermal & Statistical Physics  
Quantum Physics  
Optics  
Thesis

## Recent graduates work as:

- Product engineers
- Physics instructors
- Field service engineers
- Noise engineers
- Circuit designers
- Software developers
- Robotics experts

## Recent graduates have been accepted at:

- Cornell University (astronomy)
- Harvard University (physics)
- Oregon State University (oceanography)
- Princeton University (molecular biology and neuroscience)
- Stanford University (electrical engineering)

## What can you do with a degree in Physics?

Spanning the poetic and the prosaic, physics helps us grasp how the universe works and illuminates the connections between natural and physical phenomena from earthquakes, solar energy and lasers to quarks, black holes and magnetic fields.

Physics equips students with quantitative and analytic skills as well as a rigorous understanding of the fundamentals behind matter and technology. Students acquire deep technical knowledge to help solve problems in fields such as astro/bio/geophysics, physical oceanography, engineering, computer systems, medical research and finance.

Simply put, a physics degree gives students powerful skills to change the world by inventing, analyzing and improving.

## Graduates that are career ready

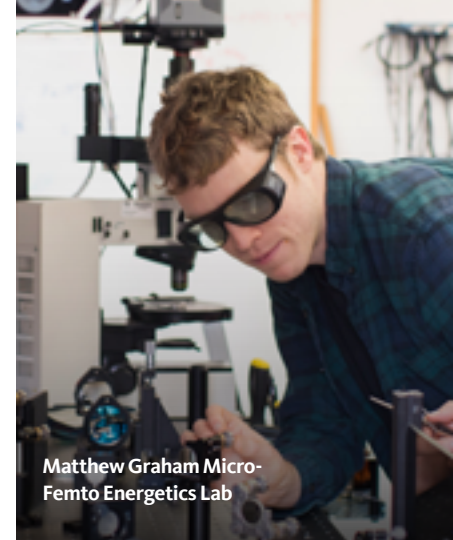
Our students do extremely well in the job market and gain admission to competitive graduate programs.

According to the National Association of Colleges and Employers, physics has one of the lowest unemployment rates. Based on their 2015 salary survey, the average starting salary of physics graduates is \$64,377.

Physics graduates don't all work in labs or teach physics. Many find satisfying jobs in diverse fields, from national laboratories, academic research, software and IT, medical physics, government policy and think tanks to science journalism, nanotechnology, space and defense. Some even landed jobs as software engineers at Facebook, neuroscience professors and biomedical engineers.



KC Walsh and a graduate teaching assistant



Matthew Graham Micro-Femto Energetics Lab



Janet Tate Materials Science Lab