Welcome to the Department of Physics

Physics opens the door to a vast range of opportunities, and our vibrant research programme illustrates the range of topics tackled by physicists – and physics students.

Students in many fields need a sound understanding of the physical world. We offer a comprehensive range of courses in Physics, and potential specialisations in Geophysics, Medical Physics and Imaging Technologies, and Photonics.

A Physics degree provides students with the skills they need to succeed, and our graduates work in a host of interesting jobs in New Zealand and around the world.

Our students work in a supportive and stimulating environment and learn from some of New Zealand’s leading scientists. Auckland physicists are inventing new kinds of lasers, creating innovative technologies to diagnose illnesses in living tissue, understanding the Earth’s changing climate, searching for planets around distant stars, understanding the connections between particle physics and the Big Bang, and much, much more.

We are happy to hear from prospective students – please get in touch if you have any questions about studying Physics at the University of Auckland.

PROFESSOR RICHARD EASTHER
Head of Department

Why study with us?
Our expertise spans the entire world of physics and beyond. And whether your interest lies in pure physics or a multi-disciplinary field, you’ll be guided by research-active teaching staff.
Postgraduate study in Physics

Postgraduate Diploma in Science (PGDipSci)

Prerequisite

- A major in Physics, or equivalent as approved by the Head of Department

Programme structure

- 75 points from PHYSICS 625-681, 691, 701-787, 788

And

- 45 additional points from PHYSICS 625-681, 691, 701-787, 788, MATHS 761-763, GEOPHYS 761-763, 780

Or

- At least 15 additional points from PHYSICS 625-681, 691, 701-787, 788, MATHS 761-763, GEOPHYS 761-763, 780 and up to a further 30 points, subject to the approval of the Head of Department, from approved 600 and 700 level courses in related subjects
Bachelor of Science (Honours) (BSc(Hons)) in Physics

Prerequisite

- A major in Physics and at least 90 points at Stage III

Students who wish to take a BSc(Hons) in Physics must have attained at least a B average in 45 points above Stage II in the relevant subject major.

Programme structure

- 30 points: PHYSICS 789 Dissertation
- 45 points from PHYSICS 701-788, 791, 792

And

- 45 additional points from PHYSICS 701-788, 791, 792, MATHS 761-763, GEOPHYS 761-780

Or

- At least 15 additional points from PHYSICS 701-788, 791, 792, GEOPHYS 761-780, MATHS 761-770 and up to 30 points from approved 700 level courses in related subjects as approved by the Head of Department.

Bachelor of Science (Honours) (BSc(Hons)) in Medical Physics and Imaging Technology

Prerequisites

- A major in Physics and at least 90 points at Stage III

Students who complete the BSc in Physics with a B average or higher in 45 points above Stage II are strongly encouraged to enrol in the BSc(Hons) in Medical Physics and Imaging Technology.

Recommended

On top of the BSc in Physics core papers, it is recommended to have taken: PHYSICS 244, 340 and 333.

Additionally, students who have done the common year in Science can complement their curriculum with these papers from the FHMS schedule: MEDSCI 205, 206 and 309.

Programme structure

- 45 points: PHYSICS 787
- 60 points: MEDSCI 703, 737, PHYSICS 701, 780
- 15 points: MEDSCI 701-740, PHYSICS 701-780, 791, 792

The MPIT programme has been designed with particular input from the Australasian College of Physical Scientists & Engineers in Medicine (ACPSEM) and local industries most likely to recruit graduates. Several former students have carried out their fourth year projects with Medical Physicists or in the Medical School as well as on industrial projects.
Bachelor of Science (Honours) (BSc(Hons)) in Photonics

Students who complete the BSc in Physics (Photonics theme) with a B average or higher in 45 points above stage II are strongly encouraged to enrol in the Bachelor of Science (Honours) year in Photonics. This additional year of study includes a 45 point research project (usually to be carried out in collaboration with industrial partners) as well as a selection of honours level photonics and communications papers from Physics and Electrical Engineering.

Prerequisites

- A major in Physics and at least 90 points at Stage III
- Students must have completed two of ELECTENG 209, 210 and 303

Recommended

In addition to the BSc in Physics core papers, it is recommended to have taken: PHYSICS 340, and 333. In addition to the BSc in physics core papers, it is recommended to have taken: PHYSICS 340, 325 and 326.

Programme structure

- 45 points: PHYSICS 787
- 30 points: PHYS 726, PHYS 727
- at least 15 points from PHYSICS 701, ELECTENG 732, 726
- up to 30 points from other 600 or 700 level courses in Physics or related subjects approved by the Head of Department

Master of Science (MSc) in Physics

Prerequisite

- A BSc(Hons) or PGDipSci in Physics

Programme structure

- 120 points: PHYSICS 796 MSc Thesis in Physics

Doctor of Philosophy (PhD) in Physics

Entry to PhD

The normal requirement for admission to the PhD is an honours degree with second class honours (division one or better), either MSc, BSc(Hons), or BTech. The programme typically takes three to four years of full-time study. The first step towards enrolling in a PhD is to identify a research topic or area and talk to prospective supervisors.

Selection of a supervisor

Feel free to contact our academic staff directly to discuss your ideas.

www.physics.auckland.ac.nz/research
## Postgraduate Physics courses

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<thead>
<tr>
<th>Course code</th>
<th>Title</th>
<th>Points</th>
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<tbody>
<tr>
<td>PHYSICS 625</td>
<td>Selected Topics 1</td>
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<td>PHYSICS 681</td>
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<td>PHYSICS 701</td>
<td>Linear Systems</td>
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<td>PHYSICS 703</td>
<td>Advanced Quantum Mechanics</td>
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<td>PHYSICS 705</td>
<td>Advanced Electromagnetism and Special Relativity</td>
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<td>PHYSICS 706</td>
<td>Quantum Field Theory</td>
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<td>PHYSICS 707</td>
<td>Inverse Problems</td>
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<td>PHYSICS 708</td>
<td>Statistical Mechanics and Stochastic Processes</td>
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<td>PHYSICS 726</td>
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<td>PHYSICS 727</td>
<td>Optoelectronics and Communications</td>
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<td>PHYSICS 731</td>
<td>Wave Propagation</td>
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<td>PHYSICS 732</td>
<td>Fluid Mechanics and Applications</td>
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<td>PHYSICS 755</td>
<td>Particle Physics</td>
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<td>PHYSICS 756</td>
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<td>PHYSICS 760</td>
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<tr>
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For course descriptions and more information, go to [www.physics.auckland.ac.nz/pg](http://www.physics.auckland.ac.nz/pg)
Research areas in Physics

**Fundamental Physics, Particle Physics and Astrophysics**
When investigating the fundamental properties of the physical universe, we combine strengths in early universe cosmology, LHC-based heavy ion physics, stellar evolution, and searches for extrasolar planets.

**Complex Systems: Biophysics, Condensed Matter and Complexity**
Research at the University of Auckland connects condensed matter physics to the physics of complex systems in ecology and the social sciences, and engages with the growing field of data science.

**Physics of Atoms, Molecules and Optics**
Our research focuses on interactions between light and matter – from fundamental quantum mechanics to the use of powerful lasers in material processing. Our graduates are equipped for both industrial and academic careers.

**Physics of the Environment**
The department’s geophysicists tackle questions including seismology to climate science. Support for this crucial research comes from government agencies, industry collaborations and private philanthropy.

**Physics of Measurement and Materials**
University of Auckland physicists identify and develop new technologies, techniques, and materials. With a strong record of innovation, the department has provided a spring-board for several successful spinout companies.

“I decided to study at the University of Auckland because of the good reputation the University has.

“The interdisciplinary aspect of my project has great potential for research, which is fantastic, as I hope to work on independent research and eventually become an entrepreneur.

“I have an excellent supervisor who helps guide my research. As part of this department, I have made excellent friends and built networks. I also get to teach undergraduate laboratory courses, which I really enjoy.”

*Ankita Gangotra* is studying toward a PhD in Physics.
Helpful information

Academic dates
www.auckland.ac.nz/dates

Accommodation
www.accommodation.auckland.ac.nz

Apply for postgraduate study
www.auckland.ac.nz/applynow

Career Development and Employment Services
www.cdes.auckland.ac.nz

Childcare
www.auckland.ac.nz/childcare

Course advice and degree planning in Science
www.science.auckland.ac.nz/student-centre

Disability Services
www.disability.auckland.ac.nz

How to enrol
www.auckland.ac.nz/enrolment

Information for postgraduate students
www.postgraduate.ac.nz

International students
www.international.auckland.ac.nz

Libraries and Learning Services
www.library.auckland.ac.nz

Māori and Pacific students
www.science.auckland.ac.nz/tuakana

Need help?
www.askauckland.ac.nz

Postgraduate Students’ Association
www.pgsa.org.nz

Rainbow Science Network for LGBTI students
www.science.auckland.ac.nz/rainbowscience

Scholarships and awards
www.scholarships.auckland.ac.nz
www.auckland.ac.nz/fees

Support for students
www.science.auckland.ac.nz/support

Questions about Physics?
d.krofcheck@auckland.ac.nz

Disclaimer
Although every reasonable effort is made to ensure accuracy, the information in this document is provided as a general guide only for students and is subject to alteration. All students enrolling at the University of Auckland must consult its official document, the University of Auckland Calendar, to ensure that they are aware of and comply with all regulations, requirements and policies.