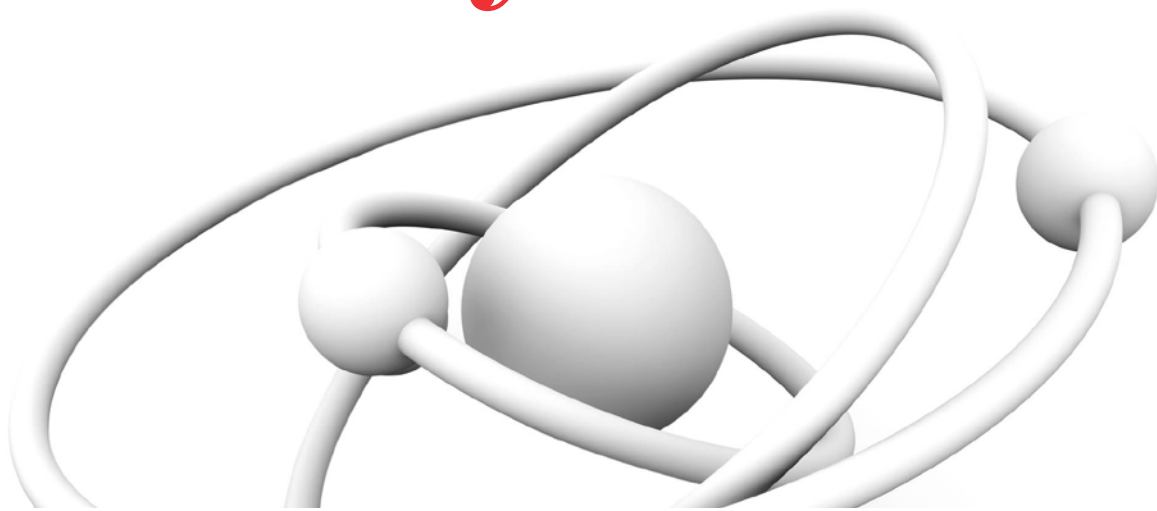


# What can I do with a degree in Physics?

# Physics.



## Career planning: what do I need to know?

Knowledge of yourself is important for career decision making. Start by looking at your personal goals, abilities, values and interests to explore study and career options that are relevant to you. Some of these may change over time, so it is important to self-reflect and evaluate your career on an ongoing basis.

### What do employers look for?

Many employers look for generic skills such as communication, customer-focus, bicultural competence, cultural awareness and teamwork. With technology and globalisation changing the nature of society, skills such as resilience, problem solving and adaptability are valuable at work as well as in life.

### How can I develop these skills?

- Some skills are developed through your degree
- Extra-curricular activities can help, for example getting involved in clubs, mentoring, cultural groups, part-time work or volunteering
- Be open to professional and personal development opportunities. Whether it is undertaking an internship, overseas exchange, skills seminar, or joining an industry group – these activities will enhance your employability.

### What else should I know?

The career options in this brochure are examples only and the list is not exhaustive. Some careers may require further study beyond a first degree or additional work experience. Some pathways and degrees have a recommended school background. Find more subject details at [www.canterbury.ac.nz/subjects/phys](http://www.canterbury.ac.nz/subjects/phys)

If this brochure does not answer your questions, talking to an expert such as a career consultant can help you to identify the next steps in your career decision making journey.

[www.canterbury.ac.nz/careers](http://www.canterbury.ac.nz/careers)

## What is Physics?

Physics aims to understand the behaviour of matter and energy from the scale of subatomic particles to that of the Universe itself. From computers to communication systems, architecture to agriculture; modern life is overwhelmingly built using the understanding of nature that physics provides. Modern physics provides a framework for understanding – and contributing to – major advances in technology now and in the future.



## AT A GLANCE

**MORE**

medical physicists are needed in Aotearoa New Zealand<sup>^</sup>

**\$100k+**

the amount Senior Software Engineer's can earn\*

**\$10-30k+**

scholarships of course fees plus \$10-30,000 available for high school science teacher trainees<sup>#</sup>

## What skills have UC graduates gained?

Through their Physics degree, graduates gain a valuable set of transferable skills that includes:

- Problem solving
- Ability to communicate orally and in writing
- Mathematical and computer skills
- Capacity to think creatively, logically and quantitatively
- Cooperation, teamwork and leadership
- Innovation and imagination
- Planning and organisation skills.

Applied learning opportunities are available such as laboratory sessions, fieldtrips and internships. These experiences deepen your skillset, awareness of others, working knowledge and employability.

## Where have UC graduates been employed?

Many Physics graduates are employed at:

- Crown Research Institutes
- The National Radiation Laboratory
- Hospitals and District Health Boards
- Universities
- Meteorological Service.

Some are not employed as specific scientists – their Physics skills are valued in industries such as:

- IT, computer and electronics
- Banking and finance
- The armed services and police
- Aerospace and aeronautics (including airlines)
- School teaching
- Geotechnical
- Telecommunications
- Agribusiness
- Energy.

UC alumni have done postgraduate study or postdoctoral research at universities around the world including China, Germany, Malaysia, the Netherlands, Pakistan, and the USA.

<sup>^</sup> Immigration New Zealand's 2017 long-term skill shortage list [www.skillshortages.immigration.govt.nz](http://www.skillshortages.immigration.govt.nz)

<sup>\*</sup> [www.payscale.com/research/NZ/Degree=Bachelor\\_of\\_Science\\_\(BS\\_%2F\\_BSc\)%2C\\_Physics/Salary](http://www.payscale.com/research/NZ/Degree=Bachelor_of_Science_(BS_%2F_BSc)%2C_Physics/Salary)

<sup>#</sup> 2021 TeachNZ scholarships [www.teachnz.govt.nz/scholarships](http://www.teachnz.govt.nz/scholarships)

## What jobs and activities do UC graduates do?

Graduates with this degree are employed in a range of jobs — see some examples below.

*Note: Some of the jobs listed may require postgraduate study. See the 'Further study' section.*

### Field / laboratory technician

- Plans and carries out research experiments
- Maintains and calibrates equipment
- Liaises with scientists and industry personnel
- Collects and collates data, and drafts reports

### Research scientist, postdoctoral researcher

- Organises and conducts research
- Tests theories and operates instruments
- Analyses data and scientific phenomena to develop explanatory theories
- Writes reports and publishes articles
- Consults with and advises industry

### Medical physics registrar

- Operates and improves diagnostic and therapeutic equipment
- Uses knowledge and skills to help prevent, diagnose and treat different diseases/conditions
- Ensures radiology, nuclear medicine and radiation treatments are safe and effective

### Telecommunications / software engineer

- Analyses customer needs, evaluates computer software and researches new technologies
- Develops software programs for new products
- Manages software development projects

### Programmer, software developer

- Determines specifications and writes code
- Builds prototypes of software programs
- Tests and fixes computer programs and systems
- Maintains and upgrades programs and systems

- May develop and integrate technical aspects of websites/mobile apps along with other workers

### Secondary school teacher

- Plans and delivers instructional lessons
- Evaluates performance and provides feedback
- Sets and marks assignments and tests

### Patent advisor

- Researches technical or scientific documents, to assess if a product is new and innovative
- Maintains knowledge of laws and regulations
- Advises businesses, government and industry

### Meteorologist

- Monitors weather systems and atmospheric patterns
- Analyses data and uses forecasting models to predict weather conditions and climate trends
- Prepares weather maps, forecasts and alerts
- Designs tests to measure air quality, ozone etc

### Entrepreneur & self-employment

Entrepreneurship and innovation are an increasing part of the working landscape. Through generating a business idea, or getting involved in a start-up/business venture, you have the potential to create a work opportunity that aligns with your knowledge, skills, values and risk profile. To get started on how to establish, run and grow a new business, go to Te Pokapū Rakahinonga, Centre for Entrepreneurship at the University of Canterbury [www.canterbury.ac.nz/uce](http://www.canterbury.ac.nz/uce)

## What professional organisations can I engage with?

Connecting with professional bodies and organisations can help you to establish professional networks and learn more about different career options in your area of interest. Gaining valuable insight into a profession can assist in making informed career decisions.

- New Zealand Institute of Physics [www.nzip.org.nz](http://www.nzip.org.nz)

- Te Apārangi | Royal Society [www.royalsociety.org.nz](http://www.royalsociety.org.nz)

- Institute of Physics [www.iop.org](http://www.iop.org)

- Science Communicators Association of New Zealand [www.scanz.co.nz](http://www.scanz.co.nz)

Having a professional presence on social media networks such as [www.linkedin.com](http://www.linkedin.com) and Facebook can help you to keep up to date with important industry developments and trends, networking opportunities, events and job vacancies. Following relevant professional bodies, organisations, companies and thought leaders is a great way to gain a deeper awareness of the industries that interest you. Social media presents an opportunity to build and enhance networks as well as to display your involvement in projects and any academic successes.

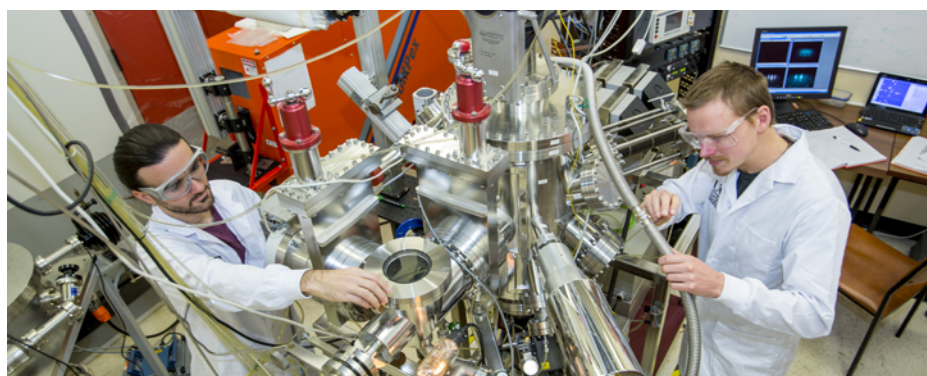
## Why do further study and what are my options?

Postgraduate study can facilitate career benefits such as specialist skills, entry into a specific occupation, higher starting salary, and advanced research capability. It is important to determine which, if any, further study will help you.

Physics graduates can progress into a number of programmes from honours to master's and PhD level. These degrees provide advanced research and writing skills. Advanced study can lead to an academic career in teaching and research.

Qualifications in Medical Physics are offered at UC — a postgraduate diploma, honours, master's and PhD. The extensive range reflects the demand for skilled graduates.

UC also has a range of conversion degrees eg, in Teaching and Learning, Journalism, Applied Data Science, and Business Management. For listings visit [www.canterbury.ac.nz/courses](http://www.canterbury.ac.nz/courses)



## Useful links

Te Rōpū Rapuara UC Careers [www.canterbury.ac.nz/careers](http://www.canterbury.ac.nz/careers)

Careers New Zealand [www.careers.govt.nz](http://www.careers.govt.nz)

Association for Women in the Sciences NZ [www.awis.org.nz](http://www.awis.org.nz)

Crown Research Institute careers [www.careers.sciencenewzealand.org](http://www.careers.sciencenewzealand.org)



## Toby



Bachelor of Science in Physics and Mathematics  
Honours Degree in Physics  
YouTube Content Creator

### What led you to study physics and mathematics?

I was attracted to the challenge of studying physics and maths as I saw these subjects as a way to seek answers to interesting questions about the world around us. At school I had

been inspired by science communicators on TV, through books and on YouTube who helped open my eyes to science. Like many aspiring physicists I was attracted to the big mysteries of science such as dark matter, black holes and quantum physics, and I wanted to gain a deeper understanding of these ideas at university.

### Why did you decide to create a YouTube channel?

I started my YouTube channel 'Tibeets' in 2011 while I was still in high school. I started uploading videos just as a hobby - it would take another 7 years until it became something that could be my job. I have kept uploading videos for so many years because I enjoy finding creative ways to present science. My channel grew very slowly for the first few years but once I found my niche and became more consistent with videos I started to see growth. This year I passed 500,000 subscribers and 50 million total views.

### What have been some of the highlights of your career?

I'm grateful that other educational creators have been really welcoming and friendly to me and I've loved getting to know many of them at annual VidCon events (a convention for online video). I've collaborated on videos with some of my favourite creators including Vsauce3 and Physics Girl.

### What do you enjoy about being self employed?

Working for myself, I have a lot of creative freedom. I get to choose which topics to cover in videos so I pick something that I would enjoy researching, although I do need to consider what topics will perform well with my audience and follow YouTube trends to some extent.

### What advice do you have for prospective physics students?

Enrolling in a physics degree will help you to establish a career in the field but you don't need to wait until you are at university to learn physics. There are lots of resources both online and offline including books, lectures and YouTube videos which you can use to get a head start.

### Read more online

Read more stories about our students' university experiences online. UC alumni make a difference in varied ways around the globe. To find out where graduates are now visit [www.canterbury.ac.nz/getstarted/whyuc/student-profiles](http://www.canterbury.ac.nz/getstarted/whyuc/student-profiles)

*The information in this brochure was correct at the time of print but is subject to change.*

## More information

### UC students seeking study advice.

Te Kura Matū | School of Physical and Chemical Sciences

The School is made up of over 80 staff and runs an exciting programme of teaching and research using state-of-the-art facilities. Our areas of scholarship are diverse and we collaborate nationally and internationally.

Our teaching staff are all active researchers and very passionate. Dynamic teams are leading research in a wide range of disciplines, from molecular cloning to stellar astrophysics, from the design of new pharmaceuticals to nanotechnology devices.

T: 03 369 4141

E: [scienceugadvice@canterbury.ac.nz](mailto:scienceugadvice@canterbury.ac.nz)

[www.canterbury.ac.nz/study/subjects/physics](http://www.canterbury.ac.nz/study/subjects/physics)

### Anyone seeking careers advice.

Te Rōpū Rapuara | UC Careers

UC offers intending and current students and recent graduates a wide range of services, including individual career guidance, seminars, career resources and student and graduate employment opportunities.

T: +64 3 369 0303

E: [careers@canterbury.ac.nz](mailto:careers@canterbury.ac.nz)

[www.canterbury.ac.nz/careers](http://www.canterbury.ac.nz/careers)

### Prospective students seeking study advice.

Te Rōpū Takawaenga | Student Liaison

The liaison team provide advice to future students who are starting their degree for the first time.

They can assist with information on degrees, scholarships, accommodation, and other aspects of university life. We have offices in Christchurch, Auckland and Wellington.

Ōtautahi | Christchurch

T: 0800 VARSITY (0800 827 748)

E: [liaison@canterbury.ac.nz](mailto:liaison@canterbury.ac.nz)

Tāmaki Makaurau | Auckland

T: 0800 UCAUCK

E: [auckland@canterbury.ac.nz](mailto:auckland@canterbury.ac.nz)

Te Whanganui-a-Tara | Wellington

T: 0800 VARSITY (0800 827 748)

E: [wellington@canterbury.ac.nz](mailto:wellington@canterbury.ac.nz)

[www.canterbury.ac.nz/liaison](http://www.canterbury.ac.nz/liaison)

