Get to know

PHYSICS AND ASTRONOMY

The Department of Physics at Queen’s is one of Canada’s leading teaching and research institutes in Physics, Engineering Physics and Astronomy. Our faculty include high-profile, world-class physicists and astronomers such as Nobel Laureate Art McDonald. Queen’s has the largest, combined research group in astronomy, astrophysics and astroparticle physics in North America, and possibly the world. The Physics Department also created the first Engineering Physics program in Canada. World-leading researchers in quantum optics, nanoscience and nanophotonics merge our strength in applied physics with fundamental research in condensed matter physics and optics.

Physics at Queen’s combines high calibre research with an intermediate-scale learning setting enabling attention and care towards undergraduate teaching as well as exposure to a broad range of topics and expertise. Our students will learn in an engaging environment with the opportunity to conduct research in state-of-the-art laboratories, including inter-disciplinary research, as well as projects involving international collaborators such as experiments in dark matter and neutrinos at SNOLAB.

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A Common START

Students in our Faculty are admitted into Arts, Science or Computing but the focus is on a common first year. Through self-exploration, and while you settle into university life, you have the chance to work with our advisors and faculty to uncover where your real interests and opportunities for success are. Sometimes that discovery happens fairly quickly, and for other students it takes some work and time before the “ah-ha!” happens – either way your first year at Queen’s will be a great experience.

Degree OPTIONS

Bachelor of Science (Honours)
Major / Minor / Specialization in Physics, Astrophysics, Mathematical Physics
Bachelor of Science (General)
Bachelor of Arts (General)
Combined BScH/MSc
Internship option available

Queen’s ADMISSIONS

Students apply to Queen’s Science (QS) through the OUAC (Ontario Universities Application Centre) website (ouac.on.ca). Secondary School prerequisites include English 4U, Advanced Functions 4U, Calculus and Vectors 4U, plus two of Biology 4U, Chemistry 4U or Physics 4U.

Course HIGHLIGHTS

One of the most popular courses in physics is our Physicists in the Nuclear Age course for those interested in the impact of science on our century. In 2nd and 3rd years, students study topics such as classical mechanics, electromagnetism, thermodynamics, advanced laboratory, relativity and quantum mechanics. In 4th year, students have the opportunity to take specialized courses in current, modern subjects such as nanoscience, medical physics, lasers, nuclear and particle physics, solid state physics and general relativity.
1ST YEAR

- In first year take PHYS 104 or 106. Take MATH 110 or 111, MATH 120 or 121. If you’re thinking about specializing in Astrophysics, take CHEM 112.
- Each Plan will have at least one required first-year course, including minors. It is important to take a variety of first-year courses to keep as many pathways open as possible for you going into second year. For details see the Arts and Science Academic Calendar.

GET THE COURSES YOU NEED

2ND YEAR

- In second year take PHYS 206, 212, 239, 242 and 250 lab. Be sure to take the 200-level MATH courses that are required, as 300-level PHYS relies on them. Astrophysics specialization students take PHYS 216.
- Need help mapping all of your core, option, supporting and elective courses (including those not listed above) to make sure you will have what you need to complete your degree? Use the Course Mapping Tool on the Arts and Science website.

GET RELEVANT EXPERIENCE

3RD YEAR

- Complete all 300-level requirements/core courses for the major or specialization. This is a busy year with courses like PHYS 344 and 345 (quantum mechanics), and the full-year lab course PHYS 350. Interested in a Master’s degree in Physics? Consider the Combined BSc(H)/MSc program for top students completing their 3rd year.
- Want to enhance your degree? Consider a certificate in Geographic Information Science or explore other certificates available.

GET CONNECTED WITH THE COMMUNITY

4TH OR FINAL YEAR

- PHYS S90 Honours Thesis is required for the Physics or Astrophysics Specialization Plans. Physics Majors can also complete PHYS S90 if suitably prepared. Take option courses in your areas of interest.
- By fourth year you should be working on your remaining core, option, supporting and elective courses. Make sure to map your minor and / or certificate(s) as well.
- Apply to graduate in SOLUS.

GET THINKING GLOBALY

- Investigate requirements for full-time jobs or other opportunities related to careers of interest. Assess what experience you’re lacking and fill in gaps with volunteering, clubs, or internships – check out the Career Services skills workshop for help.
- Check out Inquiry@Queen’s to present your past summer research work.

GET READY FOR LIFE AFTER GRADUATION

- Consider joining professional associations like the Canadian Association of Physicists (CAP) or the Canadian Astronomical Society (CASCA).
- Prepare for work or studies in a multi-cultural environment by taking QUIC’s Intercultural Competency Certificate, and research possible immigration regulations.
- International students interested in staying in Canada can speak with an International Student Advisor.

Consider a 12-16 month QUIP internship

Apply to jobs or future education, or make plans for other adventures. Get help from Career Services with job searching, resumes, interviews, grad school applications, or other decisions.

Where could I go after graduation?

Acoustics
Aerospace
Alternative energy
Animation
Astrophysics
Atmospheric science and modeling
Biophysics
Computer engineering
Computer simulations
Education and teaching
Financial quantitative modelling
Forensic science
Fundamental physics research
Geophysics
Imaging
Information specialist
Law
Medical imaging and medical physics
Medicine
Nanoscience
Nuclear engineering
Oceanography
Optometry
Photonics
Planetary science
Private and public research
Radiology
Remote sensing
Robotics
Space science
Technology industry
Some careers may require additional training.

Visit careers.queensu.ca/majormap.html for the online version with links!
Succeed in the workplace

What employers want

The Canadian Council of Chief Executives list the top 6 skills sought by employers as:

1. People skills  
2. Communication skills  
3. Problem-solving skills  
4. Analytical abilities  
5. Leadership skills  
6. Industry-specific knowledge

Take the time to think about the unique skills you have developed at Queen’s, starting with the skills list here for ideas. Explaining your strengths with compelling examples will be important for applications to employers and further education. For help, check out the Career Services skills workshop.

What can I learn studying PHYSICS AND ASTRONOMY?

- Knowledge of physics theories and mathematical models
- Proficiency in mathematics
- Facility for quantitative mathematical and computational analysis
- Experience with laboratory equipment
- Design experiments and develop and write research proposals
- Review scientific literature
- Draw conclusions from data and evaluate sources of error
- Explain technical information clearly in writing and verbal communication
- Use statistical software
- Adopt a systematic, analytical approach to problems

Get the help you need

Queen’s provides you with a broad range of support services from your first point of contact with the university through to graduation. At Queen's, you are never alone. We have many offices dedicated to helping you learn, think and do.

Ranging from help with academics and careers, to physical, emotional, or spiritual resources – our welcoming living and learning environment offers the programs and services you need to be successful, both academically and personally, and Queen’s wants you to succeed! Check out the Student Affairs website for available resources.