Physics and Astronomy

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 is home to the Canadian Particle Astrophysics Research Centre (CPARC) with its world-leading research activities and suite of experiments located at SNOLAB. 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.

Home to the Canadian Particle Astrophysics Research Centre (CPARC), a world-leader in Physics research.

A Year to CHOOSE

We often say that our students are like explorers. In Arts and Science, your first year is all about making choices and exploring new paths. Whether you are in Arts, Science or Computing, you will choose your courses from a wide variety of subjects as you settle into university life and become familiar with new styles of learning. By the end of your first year, you will have discovered your areas of interest, passion and success, and will then declare your major. Your first year, whether you consider it to be undeclared, undecided or simply a time for exploration, is bound to be a year full of adventure.

Degree PLANS

Bachelor of Science (Honours) Major / Minor in Physics / Specialization in Physics, Astrophysics, Mathematical Physics Internship option available

Queen’s ADMISSION

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. Visit queensu.ca/admission for additional information regarding requirements and admission to Queen’s.

Course HIGHLIGHTS

First-year students can take a physics course with 3M National Teaching Fellow Prof. James Fraser. 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.

That is a degree from Queen’s.  QUartsci.com
**1ST YEAR**

- Get the Courses You Need: 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.
- Get Relevant Experience: Join teams or clubs on campus such as Queen’s Astronomy Club, Queen’s University Experimental Sustainability Team (QUEST), Queen’s Solar Engineering Team (QSET), or Queen’s Solar Design Team.
- Get Connected with the Community: Volunteer on or off-campus with different community organizations such as Science Rendezvous or Let’s Talk Science. Consider joining a campus program or an athletics team. Off-campus community organizations welcome Queen’s students.
- Get Thinking Globally: Prepare for work or studies in a multi-cultural environment by taking QUC’s Intercultural Competency Certificate, and research possible immigration regulations.
- Get Ready for Life After Graduation: Grapple with program decisions? Go to Majors Night or get some help wondering about career options from Career Services.

**2ND YEAR**

- Get the Courses You Need: In second year take PHYS 206, 212, 219, 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.
- Get Relevant Experience: 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. Look into summer jobs by talking to the department or Career Services about work through SWeP or Work-Study.
- Get Connected with the Community: Consider entrepreneurial opportunities via programs like the Queen’s Innovation Connector Summer Initiative (QICSI).
- Get Thinking Globally: Is an exchange in your future? Start thinking about international research.
- Get Ready for Life After Graduation: Explore different careers of interest by reading books in the Career Services Career Advising and Resource Area, as well as Alternative Careers in Science. For more information check out Career Cruising by finding and connecting with alumni on LinkedIn.

**3RD YEAR**

- Get the Courses You Need: 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/MSc program for top students completing their 3rd year.
- Get Relevant Experience: Want to enhance your degree? Consider a certificate in Geographic Information Science or explore other certificates available. Consider applying to do a 12-16 month QUP internship between your third and fourth year.
- Get Connected with the Community: Investigate off-campus summer jobs involving research (such as at SNOLAB). Apply for NSERC USRA, or directly to individual faculty members and research groups in Physics and Astronomy. Many Physics students volunteer with the on-campus Observatory in Ellis Hall.
- Get Thinking Globally: International students interested in staying in Canada can speak with an International Student Advisor.
- Get Ready for Life After Graduation: Build your intercultural competence by getting involved with other cultures or by practicing or improving your language skills.

**4TH OR FINAL YEAR**

- Get the Courses You Need: PHYS 590 Honours Thesis is required for the Physics or Astrophysics Specialization Plans. Physics Majors can also complete PHYS 590 if suitably prepared. Take option courses in your areas of interest.
- Get Relevant Experience: 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.
- Get Connected with the Community: Apply to graduate in SOLUS.
- Get Thinking Globally: 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.
- Get Ready for Life After Graduation: 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.
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

Why study in Kingston?

For over 175 years, the Kingston community has been a collection of bright minds. We are proud that our city was named one of the top Intelligent Communities across the globe, an accolade largely due to the thousands of students who study here every single year. In fact, the BBC has identified Kingston as one of the GREATEST UNIVERSITY TOWNS in the world, which might be why Instagram named the city ‘the happiest place on the planet’. Just a quick drive to Toronto, Montreal, Ottawa and even New York, Kingston is a safe and liveable city. Not only are we known as the freshwater sailing capital of the world, Kingston is arguably the birthplace of hockey. Wondering what to do while you're attending school? Queen's has more clubs per capita than any other university in Canada, and Kingston has more restaurants per capita than any other city in North America; your time here is guaranteed to be 'fresh made daily'.

We’re closer than you think.

Queens

DEPARTMENT OF

PHYSICS, ENGINEERING
PHYSICS AND ASTRONOMY

Faculty of Arts and Science
Stirling Hall
64 Bader Lane
613-533-2707
queensu.ca/physics