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 who work on cutting-edge areas of computational, theoretical, applied and experimental physics. 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.

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Degree OPTIONS
Bachelor of Science (Honours)
Major / Minor / Specialization in Physics, Astrophysics or Mathematical Physics
Bachelor of Science (General)
Bachelor of Arts (General)

Queen’s ADMISSIONS
Students apply to Queen’s Science (QS) through the OUAC website. Secondary School prerequisites include English 4U, Advanced Functions 4U, Calculus and Vectors 4U, plus two of: Biology 4U, Chemistry 4U or Physics 4U.

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 will be a great experience at Queen’s.

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.

That is a degree from Queen’s.

quarts.com
Physics and Astronomy MAJOR MAP

1ST YEAR
Take PHYS 104 or 106. Take MATH 110 or 111, MATH 120 or 121. CHEM 112 is also recommended. If you’re thinking about specializing in Astrophysics, take CHEM 112. For plan requirements or thresholds, see the Arts and Science website.

Speak to an Academic Advisor at the Arts and Science Office or the Undergraduate Chair for help.

2ND YEAR
Take PHYS 206, 212, 239 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.

Speak to an academic counselor at the Arts and Science Office or the Undergraduate Chair for help with program requirements.

3RD OR FINAL YEAR
Complete all 300-level requirements/core courses for the major or specialization. This is a challenging year with courses like PHYS 344 and 345 (quantum mechanics), and the full-year lab course PHYS 350.

Consider applying to do a 12-16 month QUIP internship between your third and fourth year.

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.

Consider focusing on areas of interest. Research education requirements for careers of interest. If needed, prepare to take any required tests (like the LSAT or GMAT) and get help thinking about grad school from Career Service.

4TH OR FINAL YEAR
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.

Apply to graduate on SOLUS.

GET THE COURSES YOU NEED

GET RELEVANT EXPERIENCE
Join teams or clubs on campus such as Queen’s Astronomy Club, Queen’s University Experimental Sustainability Team (QUEST), Queen’s Space Engineering Team (QSET), Queen’s Solar Design Team, etc.

See the Co-Curricular Opportunities Directory or AMS Clubs Directory for more ideas.

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 an intramural sport or an athletics team. Off-campus community organizations welcome Queen’s students – see what’s out there!

GET THINKING GLOBALLY
The Queen’s University International Centre is your first stop to learn how to internationalize your degree or to leverage your existing cross-cultural experience.

Speak to a QUIC advisor or get involved in their programs, events and training opportunities.

GET READY FOR LIFE AFTER GRADUATION
Grappling with program decisions? Go to Majors Night or get some help wondering about career options from Career Services.

Explore different careers of interest by reading books in the Career Services Career Advising and Resource Area, such as Alternative Careers in Science. For more information check out Career Cruising or by finding and connecting with alumni on LinkedIn.

WHERE COULD I GO AFTER GRADUATION?

Acoustics
Aerospace
Alternative energy
Animation
Astrophysics
Atmospheric science and modelling
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
Photronics
Planetary science
Private and public research
Radiology
Remote sensing
Robotics
Space science
Technology industry

*Some careers may require additional training.

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Visit careers.queensu.ca/majormaps.html for the online version with links!
Physics and Astronomy

MAJOR MAP

How to use this map

• Got questions about careers and classes?
• Feeling a little lost or overwhelmed by choices?
• Wondering what you are “supposed” to be doing?

Use this map to plan for success in five overlapping areas of career and academic life. Each map helps you explore possibilities, set goals and track your accomplishments. To make your own custom map, use the My Major Map tool.

Don’t stress if you haven’t done all of the suggested activities. The map is not a prescription – it’s a tool for finding your own way at Queen’s.

Getting what you need to succeed in the workplace

WHAT DO EMPLOYERS WANT?

In a recent survey from the Canadian Council of Chief Executives the top 6 skills sought by employers were:

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

HOW DO I GET THE SKILLS I NEED?

It is important to develop a balanced skill set – many of which you will develop during your studies. To stand out, take advantage of experiential learning through the multitude of clubs and activities in and around Queen’s. Check out the Get Relevant Experience section of this map.

WHAT CAN I LEARN STUDYING PHYSICS AND ASTRONOMY AT QUEEN’S?

• 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

WHAT MAKES ME SPECIAL?

No one will get exactly the same experience as you. Take the time to think about what skills you have developed to be able to best explain them with compelling examples in future applications to employers and further education. For help with this, check out the Career Services skills workshop.

Queens University

DEPARTMENT OF Physics and Astronomy

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