Why GRADUATE STUDIES in PHYSICS, ENGINEERING PHYSICS & ASTRONOMY?

The PhD in Physics provides you with training in theory, computation, statistical modelling, and experimental methods as you pursue problems in fundamental and applied research. Physicists design mathematical models to describe complex phenomena and test these models by making observations, conducting experiments, or running numerical simulations. The skills obtained are highly sought after and transferrable to a wide range of fields. The degree leads to careers in academia and government-funded research centres as well as the private sector fields of finance, medicine, technology, and data analytics, to name just a few.

Why QUEEN’S?

Queen’s has one of the most active and dynamic physics departments in Canada. The Department is home to the McDonald Institute, a national research centre in particle astrophysics. Named after emeritus Queen’s professor and 2015 Nobel laureate Art McDonald, the Institute is closely linked to activities at SNOLAB where experiments search for dark matter and probe fundamental properties of neutrinos. Closely related is the Astrophysics group whose members at Queen’s and the nearby Royal Military College study galaxies, the extragalactic Universe, black holes and dark matter through theory, simulation, and observations at some of the world’s largest observatories. Research within the applied and engineering physics group seeks to bring new physics understanding to important problems for society, including lighting technologies, solar energy, laser manufacturing and non-destructive testing while the Condensed Matter group focuses on nanophotonics and quantum optics. Group members are key players in NanoFabrication Kingston, a University-Industry collaboration that provides researchers with access to leading-edge equipment and expertise for the design of nanotechnologies.

Program STRUCTURE

PhD (4 years): Course work, research project, thesis & defense, seminar series.

RESEARCH Areas

- Condensed Matter Physics & Optics
- Engineering & Applied Physics
- Astrophysics & Astronomy
- Particle Physics & Particle Astrophysics

We encourage you to identify an area of research interest and contact a potential supervisor before applying.

Visit the Department of Physics, Engineering Physics & Astronomy website to read faculty profiles and learn more about faculty members’ research areas. When you find a faculty member with similar research interests to yours, contact him/her and tell them about your interest in graduate work and related experience.
**ACHIEVE YOUR ACADEMIC GOALS**

**YEAR I**
- Meet early with your supervisor to set expectations and discuss roles, responsibilities, program requirements, resources, research/occupational goals, timelines, and any required accommodation plans.
- Look to Student Academic Success Services for a variety of supports.
- Attend and participate in graduate seminars and colloquia hosted by the department.

**YEAR II**
- Write and defend your thesis proposal.
- Embark on your substantive research.
- Set up regular meetings with your supervisor to discuss progress and obstacles to timely completion.
- Find your way through the academic process with the help of Expanding Horizons.
- Seek experiential/professional development opportunities.

**YEAR III**
- Continue to meet regularly with your supervisor, review research progress, and write your dissertation. Check out the SGS Dissertation Boot Camp or Dissertation on the Lake.
- Consider publishing elements of your research. Learn from the Expanding Horizons Publishing workshop.
- Begin discussion of potential thesis defense examiner.

**YEAR IV & TRANSITIONING**
- Plan date of thesis submission for examination.
- Present your research to graduate students and faculty at oral and conferences and work with supervisor to prepare for defence.
- Review submission and examination guidelines.
- Secure necessary oral defence accommodations.
- Discuss career pathways, references letters, and publication options with your supervisor.

**MAXIMIZE RESEARCH IMPACT**

**YEAR I**
- Think about audiences for your research.
- Complete ROMEO online module on research ethics if doing research with living people or sensitive topics.
- Apply to NSERC, OGS, and other funding.
- Attend conferences in your field, such as the Canadian Association of Physics Annual Congress.

**YEAR II**
- Present your work at graduate conferences, through professional associations, or topic conferences.
- Expand your research audience through social media such as Twitter or a blog.
- Apply for the Graduate Dean's Travel Grant for Doctoral Field Research.

**YEAR III**
- Continue to present at conferences.
- Consider participating in the 1 Minute Thesis (1MT) competition.
- Contact the Queen's Media Centre for guidance on speaking to news outlets about your work. List yourself on the Arts and Science University Research website.

**YEAR IV & TRANSITIONING**
- Continue to attend conferences such as the Canadian Astronomical Society Annual Meeting or the Canadian Association of Physicists Congress, and connect with scholars in your field and with community partners.
- Continue public outreach through social media and the Queen's Media Centre.

**BUILD SKILLS AND EXPERIENCE**

**YEAR I**
- Serve on departmental, faculty or university committees. Talk to the Society for Graduate Students for tips on getting involved.
- Consider positions in student services, the SGS, or media outlets like the Queen’s Journal, CFRC, and the SGS Blog. Look in the AMS Clubs Directory.
- Like a Teaching Assistant or Research Assistant position to develop your skills and experience.

**YEAR II**
- Hone skills for non-academic employment by continuing involvement on committees and in the community.
- Start keeping an eportolio of your skills, experiences and competencies.
- For help with teaching, get support from the Centre for Teaching and Learning. Enroll in SG590 or the PUTF certificate for more professional development in teaching and learning.

**YEAR III**
- Find opportunities for extra training through CTLS, Expanding Horizons, Mitacs, or other sources to boost your skills. Investigate internships from Mitacs and other sources.
- Prepare for work or studies in a multi-cultural environment by taking the QCUS and Four Directions Aboriginal Student Centre's Training Certificate.

**YEAR IV & TRANSITIONING**
- Practice articulating the skills you have been developing in settings outside the university, such as casual conversation, networking, and interviews. Get help from a Career Services workshop.

**ENGAGE WITH YOUR COMMUNITY**

**YEAR I**
- Consider volunteering with different community organizations, such as Martha's Table, or Loving Spoonful.
- Take advantage of the facilities linked to the department, including the Cancer Centre of Southeastern Ontario, the Sudbury Neutrino Observatory (SNOlab), the Kingston Nano-Fabrication Laboratory (KNFL), and more.

**YEAR II**
- Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.

**YEAR III**
- Do some targeted networking with people working in careers of interest, through Queen's Connects on LinkedIn, the Queen's Alumni Association, professional associations, and at conferences. Get help from a Career Services workshop.

**YEAR IV & TRANSITIONING**
- Consider joining professional societies like the Canadian Association of Physicists.
- Join groups on LinkedIn reflecting specific careers or topics of interest.

**LAUNCH YOUR CAREER**

**YEAR I**
- Finding career fit starts with knowing yourself. Take a Career Services career planning workshop or meet with a career counsellor for help. Check out books like What Are You Going to Do With That? Planning a Scientific Career in Industry from the Career Resource Area for advice on various career options.
- Start reading publications like University Affairs and the Chronicle of Higher Education. Browse non-academic labour market websites.
- Stay on the lookout for special events like Graduate Student Career Forum to explore your career pathways.

**YEAR II**
- Start building your teaching portfolio including student evaluations, and seeking mentorship.
- Explore different careers of interest by reading alumni profiles on the SGS website, and using Queen's Connects on LinkedIn to connect with Queen's alumni, or find alumni in various careers through Ask an Alum. For more information check out Career Cruising.
- Investigate requirements for professional positions or other opportunities related to careers of interest.

**YEAR III**
- Participate in hiring committees and attend job talks. Research academic careers of interest. Craft your CV and job application materials.
- Start focusing on non-academic areas of interest. Research organizations of interest and start putting together your resume for potential positions of interest.

**YEAR IV & TRANSITIONING**
- Build connections with faculty outside of your department. Pursue interviews for faculty positions and apply for post-doc fellowships and positions.
- Apply to jobs or make plans for other adventures. Get help from Career Services with job searching, resumes, or interviews.
- If considering jobs abroad, research possible immigration regulations. If you are an international student interested in staying in Canada, consider speaking with an International Student Advisor.

**WHERE CAN I GO?**

A PhD degree in Physics, Engineering Physics & Astronomy can take your career in many directions. Our PhD students are equipped with a strong foundation for careers in:

- Academia and research
- Consulting
- Medical technologies: radiation physics, x-ray physics
- Renewable energy
- Technology sector

Taking time to explore career options, build experience, and network can help you have a smooth transition to the world of work post-graduation.

**WHAT WILL I LEARN?**

A graduate degree in Physics, Engineering Physics & Astronomy can equip you with valuable and versatile skills, such as:

- Knowledge and technical skills
- Effective communication skills in multiple forms for diverse audiences
- Information management:
  - prioritize, organize and synthesize large amounts of information
- Time management:
  - Meet deadlines and manage responsibilities despite competing demands
- Project management:
  - develop ideas, gather information, analyze, critically appraise findings, draw and act on conclusions
- Creativity and innovation
- Perseverance
- Independence and experience as a collaborative worker
- Awareness, an understanding of social ethical practices, social responsibility, responsible research and cultural sensitivity
- Professionalism in all aspects of work, research, and interactions
- Leadership: initiative and vision leading people and discussion

*This map is intended to provide suggestions for activities and careers, but everyone's abilities, experiences, and constraints are different. Build your own Grad Map using our online My Grad Map tool.*
How do I use this map?

Whether you are considering or have embarked on graduate studies at Queen's, use this map to plan for success in five overlapping areas of your career and academic life. The map helps you explore possibilities, set goals and track your individual accomplishments. Everyone's journey is different – the guide offers options for finding your way at Queen's and setting the foundation for your future. To make your own customized map, use the online My Grad Map tool.

Where can I get help?

Queen's provides you with a broad range of support services from your first point of contact with the university through to graduation. Ranging from help with academics and careers, to physical, emotional, or spiritual resources – our welcoming environment offers the programs and services you need to be successful, both academically and personally. Check out the SGS HABITAT for available resources.

What is the community like?

At Queen's, graduate students from all disciplines learn and discover in a close-knit intellectual community. You will find friends, peers and support among the graduate students enrolled in Queen's more than 130 graduate programs within 50+ departments & research centres. With the world's best scholars, prize-winning professional development opportunities, excellent funding packages and life in the affordable, historic waterfront city of Kingston, Queen's offers a wonderful environment for graduate studies. Queen's is an integral part of the Kingston community, with the campus nestled in the core of the city, only a 10-minute walk to downtown with its shopping, dining and waterfront. For more about Kingston's history and culture, see Queen's University's Discover Kingston page.

Application FAQs

What do I need to know to APPLY?

ACADEMIC REQUIREMENTS

- Master's degree in Science or Applied Science.
- Grade requirements: minimum B+ standing.

ADDITIONAL REQUIREMENTS

- Two official transcripts for all post-secondary studies.
- At least 2 letters of reference.
- Curriculum vitae.
- If English is not a native language, prospective students must meet the English language proficiency requirements in writing, speaking, reading, and listening. The School of Graduate Studies requires the following minimum scores: TOEFL (paper-based): 550, (2) TOEFL iBT: Writing (24/30); Speaking (22/30); Reading (22/30); Listening (20/30), for a total of 88/120 (applicants must have the minimum score in each test as well as the minimum overall score), or (3) IELTS: 7.0 (academic module overall band score), or (4) PTE Academics: 65.

KEY DATES & DEADLINES

- Application due: February 15th.
- Notification of acceptance: 4 weeks after the full application has been received.

Before you start your application, please review the graduate studies application process.

What about FUNDING?

The minimum funding guarantee for Physics PhD students is $27,500 per year, throughout years 1-4. This basic level funding consists of graduate awards, external scholarships, teaching assistantships, and support from your supervisor.

We encourage all students to apply for external funding from OGS, NSERC and other sources. Queen's will automatically issue a $10,000 award to incoming PhD students who have won federal government tri-council awards. For more information, see the School of Graduate Studies' information on awards and scholarships.

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