Why GRADUATE STUDIES in PHYSICS, ENGINEERING PHYSICS & ASTRONOMY?

The Master's degree 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 and Optics 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

MSc (2 years): course work, research project, thesis & defense.

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.
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.

**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 sound 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

**WHERE CAN I GO?**
A Master’s degree in Physics, Engineering Physics & Astronomy can take your career in many directions. Many of our MSc students choose to continue their academic inquiry with a PhD. Our Master’s 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 after graduation.

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**MSc MAP**

**GETTING STARTED**

- Start with key priorities like developing your relationship with your supervisor, forming your committee, and doing your coursework.
- Find your way through the academic process with help from departmental and Expanding Horizons professional development workshops, the department Grad Chair and the SGS Habitat.

**INTERMEDIATE STAGE**

- Complete your coursework; begin to research and write your thesis.
- Attend or present at a graduate conference such as the High Performing Computing Symposium.
- Consider participating in the 3 Minute Thesis (3MT) competition.
- Set up a meeting with the School of Graduate Studies for a Grad Chat to discuss your research interests.
- Start keeping an ePortfolio of your skills, experiences and competencies.
- Use a Research Assistant or Teaching Assistant position to develop your research or teaching skills.
- For help with teaching, get support from the Centre for Teaching and Learning.
- Participate in your graduate and professional community through events such as graduate student outreach programs, organizing conferences, and research groups.
- Prepare for work or studies in a multi-cultural environment by taking a 3 Minute Thesis (3MT) competition.
- Consider publication options for your research.
- Attend a major conference in your field, such as the Canadian Association of Physics Annual Congress, a Canadian Astronomical Society Conference, or the Canadian Astronomical Society Annual Meeting.
- Consider putting an article in The Conversation.
- 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.
- Check out opportunities for extra training through CTL, Expanding Horizons, Mfrees, or other sources to boost your skills.
- Do some targeted networking with people working in careers of interest, through QueenConnects on LinkedIn, the Queen’s Alumni Association, professional associations, and at conferences. Get help from a Career Services workshop.
- Consider joining professional societies like the Canadian Association of Physicians.

**WRAPPING UP**

- Complete and defend your thesis.
- Complete your coursework; begin to research and write your thesis.
- 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.
- Check out opportunities for extra training through CTL, Expanding Horizons, Mfrees, or other sources to boost your skills.
- Do some targeted networking with people working in careers of interest, through QueenConnects on LinkedIn, the Queen’s Alumni Association, professional associations, and at conferences. Get help from a Career Services workshop.
- Consider joining professional societies like the Canadian Association of Physicians.
- Complete and defend your thesis.

**SUGGESTIONS FOR ACTIVITIES AND CAREERS**

- **Physics, Engineering Physics & Astronomy**
  - Renewable energy
  - Medical technologies: radiation physics, x-ray physics
  - Renewable energy
  - Technology sector

**ENGAGE WITH YOUR COMMUNITY**

- Explore how you can connect with your community through experiential opportunities on- and off-campus.
- 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 (SNO) Lab, the Kingston Nano-Fabrication Laboratory (KNFL), and more.
- Explore different careers of interest by reading alumni profiles on the SGS website, and using QueenConnects on LinkedIn to connect with Queen's alumni, or find alumni in various careers through Ask an Alumni.
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**MAXIMIZE RESEARCH IMPACT**

- Consider positions in student services, the SGS, or media outlets like the Queen’s Journal, CFRG, and the SGS Blog. Look in the AMS Clubs Directory for more ideas.
- Serve on departmental, faculty or university committees. Talk to the Society of Graduate & Professional Students for tips on getting involved.
- Check out professional development workshops from Expanding Horizons and the Department of Mathematics and Statistics.
- Explore different careers of interest by reading alumni profiles on the SGS website, and using QueenConnects on LinkedIn to connect with Queen's alumni, or find alumni in various careers through Ask an Alumni.
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- Consider joining professional societies like the Canadian Association of Physicians.

**BUILD SKILLS AND EXPERIENCE**

- Consider positions in student services, the SGS, or media outlets like the Queen’s Journal, CFRG, and the SGS Blog. Look in the AMS Clubs Directory for more ideas.
- Serve on departmental, faculty or university committees. Talk to the Society of Graduate & Professional Students for tips on getting involved.
- Check out professional development workshops from Expanding Horizons and the Department of Mathematics and Statistics.
- Explore different careers of interest by reading alumni profiles on the SGS website, and using QueenConnects on LinkedIn to connect with Queen's alumni, or find alumni in various careers through Ask an Alumni.
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- Consider joining professional societies like the Canadian Association of Physicians.
Application FAQs

What do I need to know to APPLY?

ACADEMIC REQUIREMENTS
- Honours undergraduate degree in Science or Applied Science and Engineering.
- Grade requirements: Minimum second class standing in undergraduate degree.

ADDITIONAL REQUIREMENTS
- 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?

MSc students in Physics receive minimum funding of $26,300 per year for the two years of the program. This basic level funding consists of graduate awards, school support, external scholarships, internal fellowships and bursaries, teaching assistantships, and research grants.

Apply for external funding from OGS, NSERC and other sources. Queen's will automatically issue a one time $5,000 award to incoming Masters students who have won federal government tri-council awards. For more information, see the School of Graduate Studies’ information on awards and scholarships.