# Physics, Engineering Physics & Astronomy MSc Map

## Applying to and Navigating Graduate Studies

## 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 transferable 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

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

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

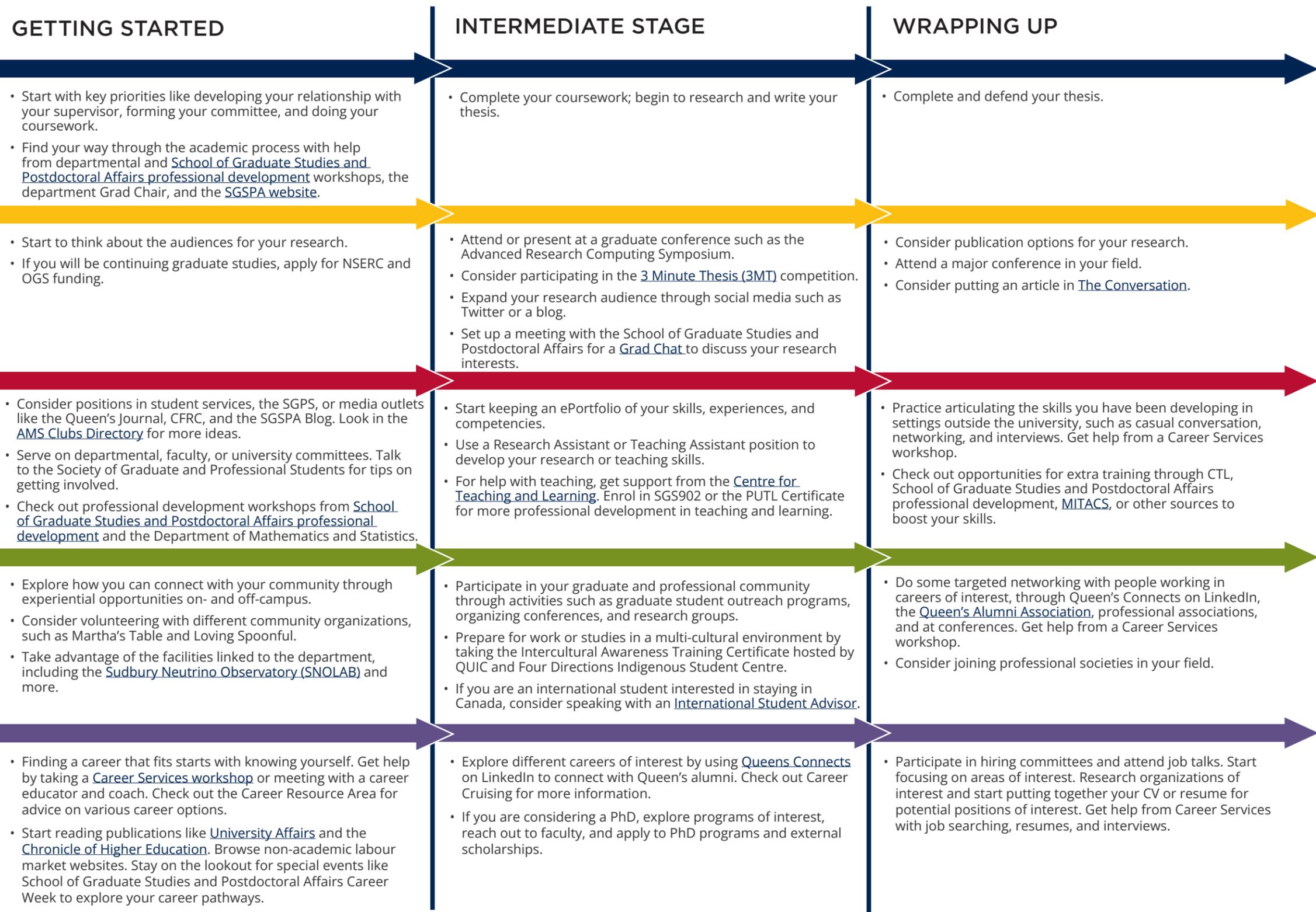Visit the Department of Physics, Engineering Physics & Astronomy website to read faculty profiles and learn more about faculty members' research areas. When you find a faculty member with similar research interests to yours, contact them and tell them about your interest in graduate work and related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

**SMITH ENGINEERING**
Queen's University

**GRADUATE STUDIES AND POSTDOCTORAL AFFAIRS**

# Physics, Engineering Physics & Astronomy MSc Map

*MASTER OF SCIENCE (MSc)*

| | GETTING STARTED | INTERMEDIATE STAGE | WRAPPING UP |
|---|---|---|---|
| **ACHIEVE YOUR ACADEMIC GOALS** | • Start with key priorities like developing your relationship with your supervisor, forming your committee, and doing your coursework.<br>• Find your way through the academic process with help from departmental and School of Graduate Studies and Postdoctoral Affairs professional development workshops, the department Grad Chair, and the SGSPA website. | • Complete your coursework; begin to research and write your thesis. | • Complete and defend your thesis. |
| **MAXIMIZE RESEARCH IMPACT** | • Start to think about the audiences for your research.<br>• If you will be continuing graduate studies, apply for NSERC and OGS funding. | • Attend or present at a graduate conference such as the Advanced Research Computing Symposium.<br>• Consider participating in the 3 Minute Thesis (3MT) competition.<br>• Expand your research audience through social media such as Twitter or a blog.<br>• Set up a meeting with the School of Graduate Studies and Postdoctoral Affairs for a Grad Chat to discuss your research interests. | • Consider publication options for your research.<br>• Attend a major conference in your field.<br>• Consider putting an article in The Conversation. |
| **BUILD SKILLS AND EXPERIENCE** | • Consider positions in student services, the SGPS, or media outlets like the Queen's Journal, CFRC, and the SGSPA Blog. Look in the AMS Clubs Directory for more ideas.<br>• Serve on departmental, faculty, or university committees. Talk to the Society of Graduate and Professional Students for tips on getting involved.<br>• Check out professional development workshops from School of Graduate Studies and Postdoctoral Affairs professional development and the Department of Mathematics and Statistics. | • Start keeping an ePortfolio of your skills, experiences, and competencies.<br>• Use a Research Assistant or Teaching Assistant position to develop your research or teaching skills.<br>• For help with teaching, get support from the Centre for Teaching and Learning. Enrol in SGS902 or the PUTL Certificate for more professional development in teaching and learning. | • 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.<br>• Check out opportunities for extra training through CTL, School of Graduate Studies and Postdoctoral Affairs professional development, MITACS, or other sources to boost your skills. |
| **ENGAGE WITH YOUR COMMUNITY** | • Explore how you can connect with your community through experiential opportunities on- and off-campus.<br>• Consider volunteering with different community organizations, such as Martha's Table and Loving Spoonful.<br>• Take advantage of the facilities linked to the department, including the Sudbury Neutrino Observatory (SNOLAB) and more. | • Participate in your graduate and professional community through activities such as graduate student outreach programs, organizing conferences, and research groups.<br>• Prepare for work or studies in a multi-cultural environment by taking the Intercultural Awareness Training Certificate hosted by QUIC and Four Directions Indigenous Student Centre.<br>• If you are an international student interested in staying in Canada, consider speaking with an International Student Advisor. | • 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.<br>• Consider joining professional societies in your field. |
| **LAUNCH YOUR CAREER** | • Finding a career that fits starts with knowing yourself. Get help by taking a Career Services workshop or meeting with a career educator and coach. Check out the Career Resource Area for advice on various career options.<br>• 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 School of Graduate Studies and Postdoctoral Affairs Career Week to explore your career pathways. | • Explore different careers of interest by using Queens Connects on LinkedIn to connect with Queen's alumni. Check out Career Cruising for more information.<br>• If you are considering a PhD, explore programs of interest, reach out to faculty, and apply to PhD programs and external scholarships. | • Participate in hiring committees and attend job talks. Start focusing on areas of interest. Research organizations of interest and start putting together your CV or resume for potential positions of interest. Get help from Career Services with job searching, resumes, and interviews. |

## 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.

### How to use this map

Use the 5 rows of the map to explore possibilities and plan for success in the five overlapping areas of career and academics. The map just offers suggestions – you don't have to do it all! To make your own custom map, use the My Grad Map tool.

# Graduate Studies FAQs

## How do I make the most of my time at Queen's?

Use the Grad Map to plan for success in five overlapping areas of your career and academic life. Everyone's journey is different - the ideas on the maps are just suggestions to help you explore possibilities. For more support with your professional development, take advantage of the SGSPA professional development framework and the new Individual Development Plan (IDP) process to set customized goals to help you get career ready when you graduate.

## 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 SGSPA website 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**
- 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 following minimum scores are required: (1) TOEFL iBT: Writing (24/30); Speaking (22/30); Reading (22/30); Listening (20/30). Applicants must have the minimum score in each test as well as the minimum overall score, or (2) IELTS: 7.0 (academic module overall band score and a 7.0 for each test band), or (3) PTE Academics: 65, or (4) CAEL CE -70 (minimum overall score).

**KEY DATES & DEADLINES**
- **Application due:** January 7th.
- **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 $28,900 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 and Postdoctoral Affairs' information on awards and scholarships.



**SMITH ENGINEERING**
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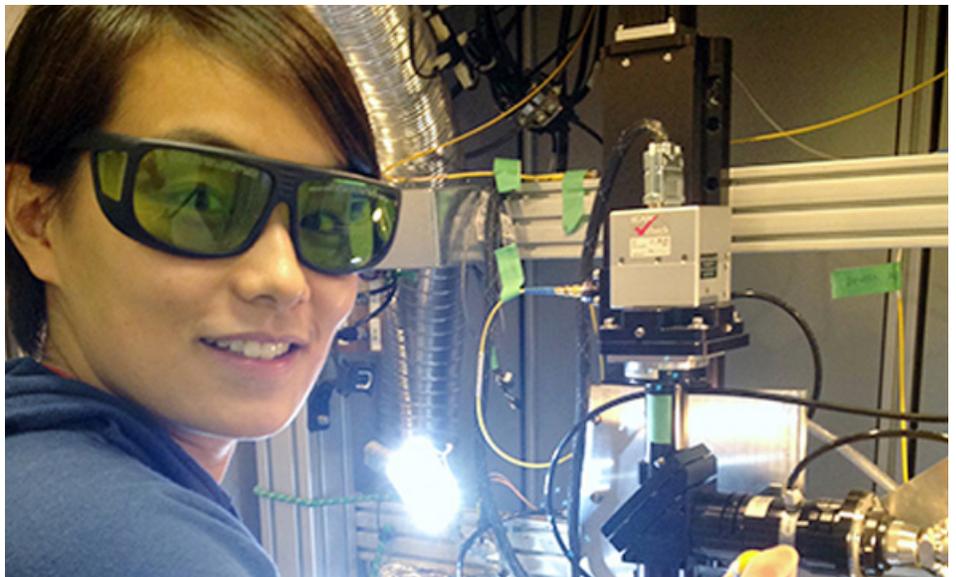
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