

Graduate Studies Info Session

Carleton University,
Department of Physics
Oct 26, 2020

What do you need to do/decide?



- **What field** interests you? At Carleton:
 - Medical Physics: **Emily Heath** will discuss details (imaging/therapy/radiobiology)
 - Experimental Particle Physics: **Razvan Gornea** will discuss details
 - Theoretical Particle Physics: **Daniel Stolarski** will discuss details
- Application: what **documentation/requirements** are needed...what are the **deadlines**...how much does it **cost**?
- Program Requirements: how many courses, other requirements, MSc or PhD?
- Funding: **how much do I make** and where does the money come from (and for how long)?

Research areas of our faculty



Experimental Particle Physics

Alain Bellerive

Mark Boulay

CRC Chair Tier 1

Dag Gillberg

Razvan Gornea

Kevin Graham

Jesse Heilman

Thomas Koffas

Simon Viel

Manuella Vinciter

Theoretical Particle Physics

Bruce Campbell

*Stephen Godfrey

Thomas Gregoire

Assoc. Chair – Undergraduate

Seyda Ipek

Heather Logan

Chair

Daniel Stolarski

Yue Zhang

Medical Physics

Emily Heath

Paul Johns

Sangeeta Murugkar

Rowan Thomson

CRC Chair Tier 2

Tong Xu

Assoc. Chair - Graduate

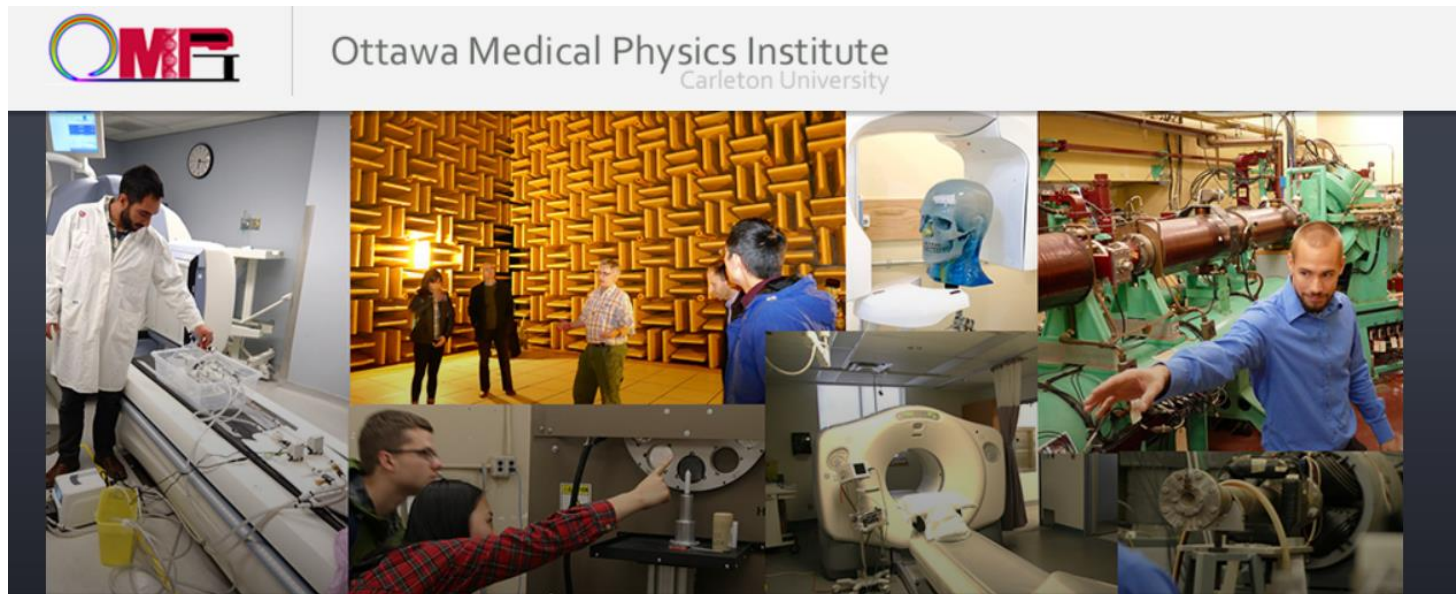
Adjunct Professors



In addition, we have 15 adjunct Professors who actively supervise graduate students across the Ottawa region.

Most of these Adjuncts are part of the **Ottawa Medical Physics Institute (OMPI)**: community network of researchers in medical Physics.

<https://physics.carleton.ca/ompi>



What you need to apply



- application cost is \$100
- ‘soft’ deadline is January 20...in fact we can still process offers for some time...hard deadline is Aug 31, 2021
- your academic history: transcripts! (Official one not needed at first.)
- a CV (academic history, work history, skills, awards, publications, talks, interests, etc)
- option to list/rank preferred areas of research
- option to list potential supervisor (if you have someone specific in mind)
- a statement of interest/purpose
 - Why do you want to pursue these studies at that place?
 - Such a statement can help them align you with just the right supervisor/thesis topic
- referee information (letters submitted by your reviewers)
 - at least 2 letters of reference from your professors: **academic letters!**
 - *Get a prof who knows you!*
 - More important than the prof where you got an A+ but who doesn’t know you!
 - Make sure at least one gives significant details on research experience/potential
 - Summer research professor? Honours project professor?

Program details and requirements



Master's programme:

- Five 0.5 credit courses + research thesis (2 years) degree in medical or particle physics
 - 6 semesters (3 semesters....year round)
 - students excelling could be invited to switch directly to PhD after 1st year

Master's Program admission requirements:

- **4-year (honours) bachelor's degree**
 - *Honours BSc in Physics or a BEng in Engineering Physics. A Combined Honours BSc degree is usually OK: Hons BSc Physics + Math, Hons BSc Physics + Computer Science, Hons BSc Physics + Chemistry, and Hons BSc Physics + Biology.*
 - BEng degree that is not in Engineering Physics is not usually prepared for graduate studies in Physics, because typically these do not include physics after the first year.
 - *Our EngPhys degree is fine for admission to our grad programme!*
- B+ or better in your major subjects
- B- or better overall
- We will also look at **your honours senior project/summer research experience** to see evidence of research capability

PhD Program:

- requires an MSc degree in the relevant field
- four 0.5 credit courses + research thesis (5 years)
- comprehensive exam + seminar

Program details and requirements



PhD Program:

- requires an MSc degree in the relevant field
- four 0.5 credit courses + research thesis (5 years)
 - extra courses maybe required for CAMPEP accredited PhD in medical physics
- comprehensive exam + seminar

Funding



- Typically 3 components:
 - TA: students work as teaching assistants during the Fall and Winter semesters
 - RA: professors contribute >1/3 of the funding from their grants (e.g. NSERC)
 - Departmental Scholarships: have both ongoing and entrance scholarships. Eligibility depends of GPA.
- ⇒ **Minimum** annual funding
 - ⇒ domestic MSc student starting in Fall 2021: ~ **\$28090 + GPA-based entrance scholarships**
 - ⇒ domestic PhD student starting in Fall 2021: ~ **\$31800 + GPA-based entrance scholarships**
- Scholarships:
 - major external awards: NSERC, OGS, QEII
 - (make more overall, but supervisors contribute less RA)
 - Carleton endowments: put students forward each year for these
 - Department awards: decided each Spring and announced the following Fall.
- Tuition and fees:
 - you pay tuition out from the above funding
 - Tuition + fees is about \$9000 ~ \$10000 per year for domestic MSc students,
 - Tuition + fees is about \$25000 for international MSc students

Where to get more info on potential thesis projects?

physics.carleton.ca:

Grad advisor: Tong Xu
grad_supervisor@physics.carleton.ca
Office: Herzberg 3318

Carleton UNIVERSITY

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Search...

Department of Physics

CONTACT FAQ

About

Prospective Undergraduate Students

Prospective Graduate Students

The Department of Physics at Carleton offers a wide set of programs at both the undergraduate and graduate level. The department is also engaged in intensive research in **Particle Physics** and **Medical Physics**. Carleton University is a full member of **TRIUMF**: Canada's National Laboratory for Particle and Nuclear Physics.

We will have positions for
Fall 2021

Want more information about our programs?

- Contact our graduate advisor at [grad-supervisor\[at\]physics.carleton.ca](mailto:grad-supervisor[at]physics.carleton.ca)
- Program information on **MSc.** and **PhD.** Physics studies at Carleton University
- General information on **MSc studies in Physics** and graduate studies in **Particle** and **Medical Physics**
- Information about which research groups are looking to take on new graduate students
 - **Particle Physics Theory, Medical Physics, ATLAS, EXO/DEAP, Environmental Radiation**

Thesis Supervisors

Making the connection between you and a thesis supervisor...

- determined at entry to program
 - we do not admit to a “pool” to find a supervisor later
- choice of supervisor affects choice of courses (especially in med phys)
- students and supervisors choose each other after we have your complete application and referee letters

- Your offer for admission will include
 - Required courses for program
 - Supervisor name
 - Funding package

External Scholarship application

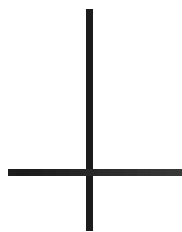
External Scholarships

Even though you are guaranteed full funding, you should consider applying for these external scholarships:

- Natural Sciences and Engineering Research Council of Canada (NSERC) Canada Graduate Scholarship, NSERC CGS-Master
 - be a Canadian citizen or a permanent resident of Canada, as of the application deadline date (Dec 1st)
 - Apply if CGPA is 82.5% or higher.
- Ontario Graduate Scholarship (OGS)
 - Apply through [participating schools in Ontario](#).
 - Apply if CGPA is 80% higher
- Why?
 - More income for you
 - Looks good on CV
 - Helping fund your research group: frees up your supervisor's grant money to buy lab equipment, send you to conferences, hire another grad student, ...

Tri-council grants: Canada Graduate Scholarships (NSERC, SSHRC, CIHR)

- CGS M (Master's) Program provides financial support to high-calibre scholars who are engaged in eligible master's or, in some cases, doctoral programs in Canada
 - Dedicated doctoral grants also exist
- CGS M Program supports up to 2,500 students annually in all disciplines and is administered jointly by Canada's three federal granting agencies: CIHR, NSERC and SSHRC.
- Selection process and post-award administration are carried out at the institutional level
 - Students **submit their application to the institution at which they intend to hold their award** using the tri-council Research Portal.
- Research Portal will instruct applicants to select up to five institutions where they intend to hold the award. Applicants must **only** select institutions where:
 - they are currently admitted or enrolled full-time in an eligible program of study and intend to pursue their studies; or
 - they will apply for full-time admission to an eligible program of study by the **internal deadline set by the institution(s)**.
- If you are in 4th year undergrad, apply now!
- http://www.nserc-crsng.gc.ca/Students-Etudiants/PG-CS/CGSM-BESCM_eng.asp




	Natural Sciences and Engineering Research Council (NSERC)	Social Sciences and Humanities Research Council (SSHRC)	Canadian Institutes of Health Research (CIHR)
Eligibility	A degree in science or engineering	Available only to programs of study that include significant research training	An exceptionally high potential for future research achievement and productivity

Canada Graduate Scholarships-Master's Program

Canadian Institutes of Health Research (CIHR) – Frederick Banting and Charles Best Canada Graduate Scholarships
Natural Sciences and Engineering Research Council of Canada (NSERC) – Alexander Graham Bell Canada Graduate Scholarships
Social Sciences and Humanities Research Council of Canada (SSHRC) – Joseph-Armand Bombardier Canada Graduate Scholarships



Overview	
Value	\$17,500 for 12 months, non-renewable
Application Deadline	December 1
Application Procedures	See below
How to Apply	<ul style="list-style-type: none"> Canadian Common CV Application <p>To create a Canadian Common CV, select  Canadian Common CV.</p> <p>To create or access an application, select Research Portal.</p> <p>To view instructions, select Instructions.</p>



A pain to fill out the first time. Give yourself time!

www.ccv-cvc.ca

Ontario Graduate Scholarship (OGS)

- OGS program provides funding to students in grad studies at master's and doctoral levels.
- It's a merit-based scholarship, with awards available to graduate students attending **participating schools in Ontario** in all disciplines of academic study.
- OGS applications are normally available in October, typically due mid November.
 - If you are in 4th year undergrad, apply now!
- Each participating school has its own unique OGS application.
 - If applying to more than one graduate program at different schools, you must complete an OGS application **for each of the schools you are planning to attend.**
- <https://osap.gov.on.ca/OSAPPortal/en/A-ZListofAid/PRDR019245.html>
- (Probably equivalents in other provinces e.g. Quebec has FQRNT)

Ontario Graduate Scholarship (OGS)

<https://gradstudents.carleton.ca/awards-and-funding/external-awards/>

Value	\$5,000 per term
Duration	2 or 3 consecutive terms
Eligibility	Students pursuing graduate studies at the master's or doctoral level at Carleton. See full criteria, info. about the application process and application documents on the OGS website.
Deadline	November 18, 2020 (example deadline at Carleton)

Scholarship Hints

Tri-council

Criteria	Description	Weight
Academic Excellence	<p>As demonstrated by past academic results, transcripts, awards and distinctions.</p> <p>Indicators of Academic Excellence:</p> <ul style="list-style-type: none"> Academic record (first-class average) Scholarships and awards held Duration of previous studies Type of program and courses pursued Course load Relative standing (if available) 	50%
Research Potential	<p>As demonstrated by the applicant's research history, their interest in discovery, the proposed research, its potential contribution to the advancement of knowledge in the field, and any anticipated outcomes.</p> <p>Indicators of Research Potential:</p> <ul style="list-style-type: none"> Quality and originality of contributions to research and development Relevance of work experience and academic training to field of proposed research Significance, feasibility and merit of proposed research Judgment and ability to think critically Ability to apply skills and knowledge Initiative and autonomy Research experience and achievements relative to expectations of someone with the candidate's academic experience 	30%
Personal Characteristics and Interpersonal Skills	<p>As demonstrated by the applicant's past professional and relevant extracurricular interactions and collaborations.</p> <p>Indicators of Personal Characteristics and Interpersonal Skills:</p> <ul style="list-style-type: none"> Work experience Leadership experience Project management including organizing conferences and meetings The ability or potential to communicate theoretical, technical and/or scientific concepts clearly and logically in written and oral formats Involvement in academic life Volunteerism/community outreach 	20%

50%

30%

20%

These scholarships are **competitive**. Unlikely to get one if you

- “just meet the requirements”
- don't put the effort into it

Good grades are important **but by no means the only criterion!**

- Research potential
- Leadership and work experience

Letters like: “Joe/Sally is a really good student and got an A+ in my class”

- Don't bother! Transcript part of application. Such letters **bring nothing** to the application.

Mention all past scholarships, award, no matter how small

- more you have, more you get...

Mention all work/research experience

- Gave a talk here? Mention it!**

Mention all volunteering/mentoring

- viewed as leadership skills

Advice on how to write a winning scholarship application

The proposal:

- Who is your target audience?
 - Seldom an expert in your proposed field! Usually read by another scientist (not always!)
 - Keep the explanation pedagogical! No jargon!
- Put it in context: explain the big picture of the problem you want to solve.
 - e.g. Health and society? Answering fundamental questions of nature? Improve a short-coming of a technique/equipment?
- What is the current state of the understanding of your problem? Recent articles?
 - You want to make it clear that you know what *not* to work on!
- Explain clearly what **you** propose to do
 - Give some detail without being too technical. A common pitfall is to give a great overview but then provide no details as to what **YOU** will do. It makes it sound like you have no clear vision of your proposed research. So, write a coherent story. Use the first person: "I will do this and then I will measure that..."
 - What tools will you be using or developing?
 - Will you be doing an experiment/collecting data/developing a new analysis technique?
 - Theoretical predictions that you are testing? Can you relate it to existing data?
 - Relevant experience in your background that will be helpful?
 - Bring it back to the **questions that you hope to answer**.

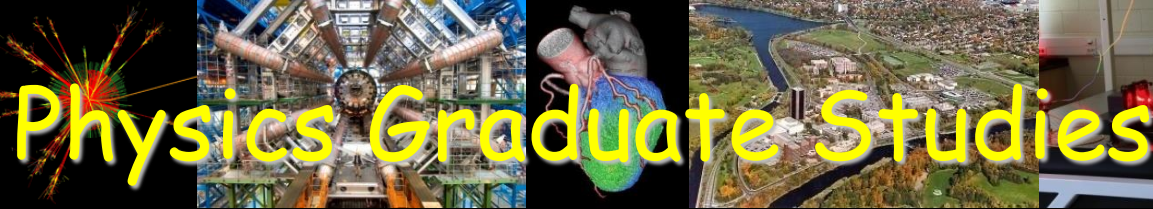
Interested in applying NSERC CGS or OGS through Carleton Physics?

Contact your potential supervisors about details of the project and research proposal.

Want some feedback on your scholarship application?

If you are applying for NSERC or OGS through Carleton Physics, we can help:

Awards	Department deadline For application feedback	To whom should I send application for feedback?	Application deadlines
NSERC (PhD)	Sept 21, 2020	Prof. Emily Heath Prof. Razvan Gornea	Sept 28, 2020
NSERC (MSc)	Nov. 23, 2020	Prof. Paul Johns Prof. Razvan Gornea	Dec. 1st 2020
OGS	Nov. 11, 2020	Prof. Paul Johns Prof. Razvan Gornea	Nov. 18, 2020



Physics Graduate Studies

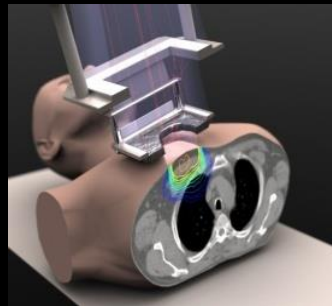
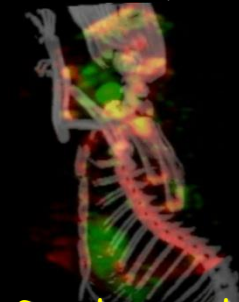
Medical Physics...

... the application of physics to problems involving human health.

- **Imaging:** MRI, PET and Nuclear Medicine, X Ray
- **Cancer therapy:** Radiation Dosimetry and Radiotherapy
- **Medical biophysics:** Radiation Biology

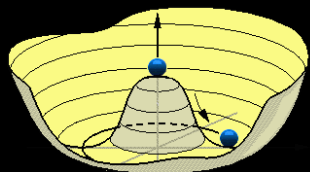
The program is offered in collaboration with medical physicists from *The Ottawa Hospital Cancer Centre*, the *National Research Council, Health Canada*, the *University of Ottawa Heart Institute*, and *The Ottawa Hospital*.

The PhD program is accredited by CAMPEP.



Graduate degree information...
physics.carleton.ca

Email: grad_supervisor@physics.carleton.ca

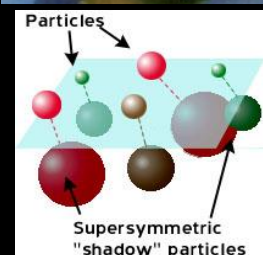
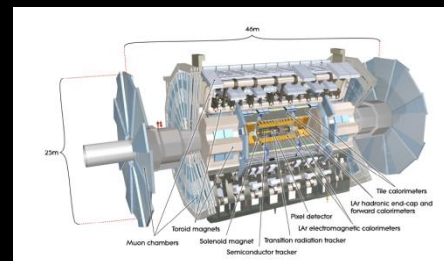


Particle Physics...

... the study of the fundamental nature of matter and the basic forces that shape our universe.

- **Theory:** Beyond the Standard Model phenomenology and model building, Higgs physics, Dark Matter physics including model building and at colliders, hadron physics, string theory.
- **Experiment:** detector instrumentation and design, physics simulation, experimental operations and data analysis on the following projects:

- ATLAS at CERN in Geneva, Switzerland
- DEAP at SNOLAB in Sudbury, ON
- nEXO at SNOLAB in Sudbury, ON
- DarkSide-20k at Gran Sasso in Italy
- HyperKamiokande in Japan



The end.



Questions?

Ask: grad_supervisor@physics.Carleton.ca