Physics: MSc, PhD

The Department of Physics, as part of Graduate Studies in Physics at University of Guelph & University of Waterloo and the Biophysics Interdepartmental Group (BIG), offers unique graduate opportunities in experimental and theoretical research. Our faculty members collaborate with exceptional research institutions including the Perimeter Institute, the Canadian Light Source, and TRIUMF.

physics.uoguelph.ca

Program

Master's students can choose between a course work option (approximately three semesters) and research-based thesis option (approximately six semesters). The PhD program requires the successful completion of a qualifying exam and the completion and defense of a research-based thesis

Research Fields

- Astrophysics and Gravitation
- Atomic, Molecular and Optical Physics
- Biophysics
- Chemical Physics
- Condensed Matter and Material Physics
- Industrial and Applied Physics
- Quantum Computing
- Subatomic Physics

Admission Requirements

For the MSc program, applicants require an honours BSc, with a minimum B average (75%) in past two years of study.

For the PhD program, applicants require an MSc in Physics with at minimum B average (75%).

Application Deadline: Ongoing

Entry: Fall, Winter, Spring

"I believe there is a lot of potential in translating astrophysical research to human societal development in general. There are several implications of astrophysical phenomena on the human species and understanding them helps us prepare for the future. In particular, the research our group does, answers questions in nuclear physics that can provide insights into the extraction of environment-friendly energy from nuclear systems." – Aman Agarwal, Physics PhD candidate

Application Requirements

In addition to meeting the minimum admission requirements, applicants are required to submit:

- All post-secondary transcripts
- Three (3) academic references
- Supplementary information form
- Physics Subject GRE (for applicants who did not complete post-secondary education in Canada)
- English Language Proficiency (for applicants for whom English is not their first language)

ARE YOU INTERESTED IN:

- Remotely exploring the surface of Mars
- Better physics education practices
- Structure and dynamics of biological matter
- Understanding the nature of the atomic nucleus
- Gravitational wave astronomy

CAREER OPPORTUNITIES:

- Education
- Energy production
- Financial modeling
- Government & policy
- Software development

CONTACT INFORMATION

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UNIVERSITY of GUELPH

IMPROVE LIFE.

UNIVERSITY OF WATERLOO

Departmental Graduate Faculty with Research Areas

EXPERIMENTAL

Leonid Brown:
Photobiology, Biospectroscopy, Structure/Function of Membrane Proteins, Bioenergetics, Ion Transport, Photosensory Transduction, Retinal-binding Proteins (rhodopsins)

John L. (Iain) Campbell, Emeritus (Actively supervising):
Physics of soft materials; biophysics; experimental tools for imaging, spectroscopy, scattering and force measurements; biopolymer nanoparticles and soft colloids; application of machine learning techniques to polymer physics

John Dutcher:
Nanobiomaterials; physics of soft materials, surfaces and interfaces; polymers and biopolymers at the nanoscale; polymer physics; viscoelasticity; bacterial biophysics; biopolymer nanoparticles; thin film instabilities; self-assembly and pattern formation

Paul Garrett:
X-ray Spectroscopy, Radiation Physics, Instrumentation for Planetary Exploration, modeling and data analysis of spectroscopy methods, Mars Exploration, Geology

Ralf Gellert:
Mars Exploration, Geology of Mars, Habitability of Mars, Planetology, X-ray Spectroscopy, alpha particle spectroscopy, digital and analogue electronics, radiation damage, Mineralogy, data analysis

De-Tong Jiang:
Condensed matter physics, Interface structure and function of electronic thin films of organic semiconductor and metal silicides, grazing-incidence X-ray scattering and spectroscopy techniques, arsenic speciation in environmental systems

Stefan Kycia:
Development and implementation of synchrotron based x-ray diffraction methods, instrumentation development, novel materials, epitaxial systems, nanomaterials, high resolution radial distribution methods.

Vladimir Ladizhansky:
Solid-state NMR, in-cell NMR, membrane protein structure, dynamics and folding, protein-protein and protein-lipid interactions, retinal-binding proteins, aquaporins, alpha-synuclein in Parkinson's Disease.

Mike Massa:
Soft and Hard Condensed Matter, Physics Education

Dennis Mücher:
Atomic nuclei with a large excess of neutrons, stellar nucleosynthesis, applications of physics in cancer treatment

Joanne O'Meara:
X-ray fluorescence (XRF) systems, physics education

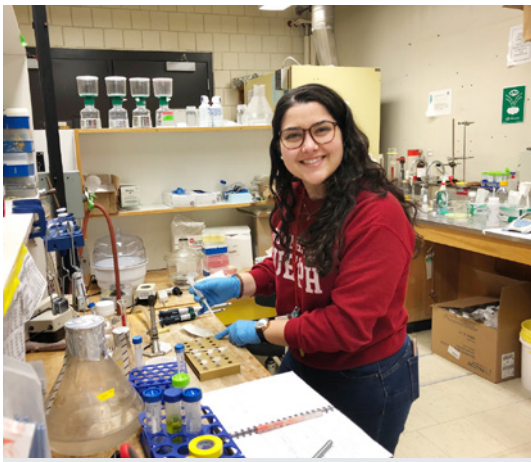
Xiao-Rong Qin:
Structural properties of vacuum vapour-deposited thin films of organic small molecules, carrier transport and other exceptional properties of films for applications in organic electronics

Carl Svensson:
Evolution of nuclear shell structure in rare isotopes, superallowed Fermi beta decays, isospin caused by Coulomb and charge-dependent forces in the nucleus

Martin Williams:
Physics Education, modern classroom technologies, designing inquiry-based physics labs to improve undergraduate learning outcomes

THEORETICAL

Liliana Caballero:
Theoretical nuclear astrophysics, heavy elements, the neutrino emission in core-collapse supernova and neutron star mergers, and bursts in accreting neutron stars



Biophysics MSc student, Marie Pinto, producing heavy retinal to investigate light-sensing proteins using new experimental techniques.

Alexandros Gezerlis:
Quantum many-body theory, fermions, ultracold atomic gases, terrestrial nuclei, neutron stars, nuclear astrophysics

Elisabeth Nicol:
Superconductivity and Dirac materials

Eric Poisson:
Gravitational physics, general relativity, black holes, compact objects, gravitational waves, self-force

Daniel Siegel:
Theoretical nuclear astrophysics, high-energy astrophysics, multi-messenger astronomy, neutron star mergers, numerical relativity, modelling gravitational wave sources

Robert Wickham:
Polymer physics, soft materials, nano-scale self-assembly, non-equilibrium statistical mechanics, bacterial biophysics, simulation

Huan Yang - Gravitational wave physics; astrophysics in the strong gravity regime; gravity-fluid correspondence and holographic theories