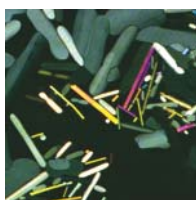


Graduate Programs in Physics and Astronomy



Western's award winning faculty members, cutting edge research and interdisciplinary environment give you the tools to engage your imagination.



The University of Western Ontario

Be a part of the great Physics and Astronomy tradition at Western

The department offers graduate programs leading to M.Sc. and Ph.D. degrees in either Physics or Astronomy. These are based on a combination of research and coursework. We offer four main areas of experimental and theoretical work:

- Astronomy and Astrophysics
- Condensed Matter Physics and Materials Science
- Medical Physics
- Planetary and Atmospheric Science

Students may also simultaneously enrol in a new collaborative program in Scientific Computing.



Astrophysics:

Astrophysicists at Western study the universe using observational, theoretical, and laboratory experimental approaches. Subjects of study include:

- star formation and the interstellar medium
- solar system dynamics
- stellar magnetism and velocity fields
- circumstellar material around hot stars
- active galactic nuclei
- stellar physics
- instrumentation

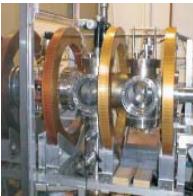


Students have access to many of the world's top astronomical facilities including the Canada-France-Hawaii telescope (CFHT), the Gemini 8m Telescopes, and orbiting satellite-observatories such as the Far-Ultraviolet Spectroscopic Explorer (FUSE) and the Caltech Submillimeter Observatory (CSO). Local facilities include a 1.2m telescope 20km north of London, offering access to one of the world's few high-resolution Coude spectrographs. Students have access to the SHARCNET high performance computational network for large-scale parallel computation.

Condensed Matter, Materials Science & Biomaterials - Experimental

Computer chips and optoelectronic devices, new polymers and soft materials, biomaterials, and devices structured on the nanometer scale are changing our world. Understanding the structure and properties of these materials, and learning how to control them, are exciting areas of study. Western has an active group of faculty engaged in world-class research using a comprehensive range of modern techniques and facilities. Areas of investigation include:

- ion beam modification of materials
- photonic materials
- soft and disordered condensed matter
- semiconductors
- nanotechnology
- complex fluids
- biomaterials

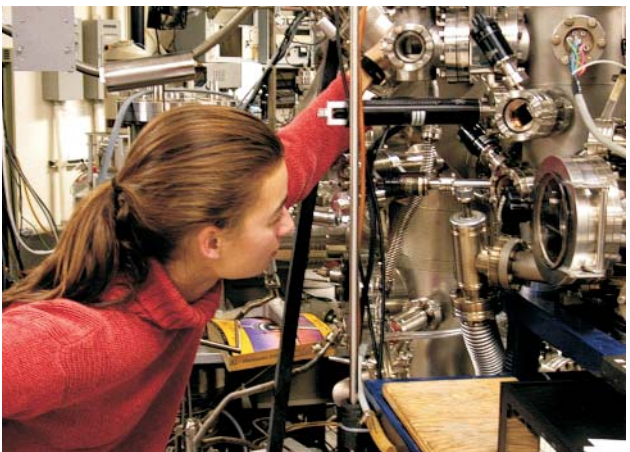


Facilities in the department include the newly constructed Nanofabrication Laboratory, ion and positron accelerators, atomic force microscopes, a rheometer, and extensive capabilities for sample preparation, thermal treatment, and characterization.

Condensed Matter, Materials Science & Biomaterials- Theoretical

We perform theoretical studies and numerical simulations of the quantum properties of solids, both as bulk materials and as constituents of engineered materials, where surface and interface effects are important. In some cases these activities parallel those being investigated by our experimental group.

Our theoretical work focuses on the dynamic and transport properties of solids (including metals, semiconductors, amorphous and biological materials) as characterized by their optical, magnetic, vibrational, electronic and electromagnetic behaviour.



Medical Physics

Medical physics applies physical concepts to the study, diagnosis, and treatment of disease. Examples are the development of imaging techniques, such as magnetic resonance imaging (MRI), ultrasound, and computed tomography (CT); the modelling and development of radiation techniques for cancer therapy; and the modelling and measurement of physiological processes, such as cellular interactions, blood flow, and disease progression.

London and Western have a long tradition of excellence in medical physics research, fostered by the close relations among the Department, London Health Sciences Centre, Robarts Research Institute, Lawson Health Research Institute, the London Regional Cancer Program, and biomedical companies.

Ongoing research includes:

- development of a field-cycled MRI high strength gradient system
- human peripheral nerve stimulation in MRI gradient systems
- ultrasound imaging and modelling
- hemodynamic (blood flow) studies and simulations
- electromagnetic field modelling and measurement in biological systems
- dual-modality imaging techniques (PET/CT and PET/MRI)
- radiation dosimetry and modelling for cancer treatment



Planetary and Atmospheric Science

Planetary and atmospheric science at Western involves experimental and theoretical investigations extending from the Earth's atmosphere to the depths of space.

We have active research programs in:

- investigations of atmospheric dynamics from the troposphere to the thermosphere
- measurements relevant to understanding ozone depletion and atmospheric change
- meteors, fireballs and meteorites
- asteroids and comets



Western has built sophisticated instruments to measure atmospheric properties, such as radars and the Purple Crow Lidar (an optical radar) capable of measuring wind, temperature and composition. These devices are part of intensive research efforts in London as well as in the Polar Environment Atmospheric Research Laboratory (PEARL) Eureka, Nunavut. Using Western's Elginfield observatory, astronomers study near-Earth asteroids, including binary asteroids. A meteor radar located nearby measures the properties of thousands of meteors a day as they burn up in the Earth's atmosphere. State-of-the-art computer simulations allow researchers to investigate diverse phenomena ranging from the capture of the tiny moons of Mars, to the propagation of waves in the earth's atmosphere.

Why Western?

Located in the north of London ("The Forest City"), Western's campus is widely recognised as one of the most beautiful in Canada.

Western's Department of Physics & Astronomy has a proud tradition of outstanding scholarship and research. Our willingness to explore new approaches to problems has resulted in the department being awarded four Canada Research Chairs in the fields of Medical Physics, Photonics of Surfaces and Interfaces, Star Formation, and Meteor Science. Take the opportunity to engage your intellectual curiosity and creativity by participating in Western's cutting edge research.

We offer an attractive environment for graduate study:

- Generous and competitive stipends (see website for up to date information)
- Rich variety of research areas
- Extensive facilities for experimental and computational research
- Attractive financial arrangements for scholarship holders
- Flexible starting dates: January, May or September
- Opportunities for interdisciplinary and collaborative research

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