



Graduate Studies in Astroparticle Physics

Prof. Caio Licciardi invites applications from students interested in pursuing a M.Sc. in Physics or Ph.D. in Materials Science at the Department of Physics at Laurentian University.

The department is engaged in intensive research in Particle Physics and Medical Physics. The local Particle Astrophysics Group has strong ties with SNOLAB (www.snolab.ca), a 2-km underground science laboratory. SNOLAB is the original site of the Sudbury Neutrino Observatory (SNO) experiment, recognized in the **2015 Nobel Prize for Physics**. In addition, Laurentian University is a member of the Arthur B. McDonald Canadian Astroparticle Physics Research Institute (mcdonaldinstitute.ca). Exploiting these advantages, we are able to ensure that each student receives world-class education, and become well prepared for a future in the academia or industry.

One of the most outstanding problems yet to be understood is that of the properties of the neutrinos. Recent observations proved that neutrinos have mass, which has implications in several areas from cosmology to elementary particle physics. In particular, this may shed light in the origin of the Universe. Assigning mass to neutrinos allows the possibility for these particles to be their own antiparticles. The most sensitive probe to this nature of the neutrino is searching for neutrinoless double beta decay, a hypothetical mode in which two electrons are emitted with no neutrinos. Our group has a leading participation in the Enriched Xenon Observatory (EXO), both in the successful EXO-200 detector and in the design of the nEXO experiment. EXO-200 has made the first observation of the two-neutrino double beta decay in ^{136}Xe , and has limits to the neutrinoless mode placed among the world's best. nEXO is planned the tonne-scale successor with nearly 200 times the sensitivity reach to the process.

Thesis work includes a combination of physics data analysis, simulations, and development of hardware techniques within or towards the EXO program. Ph.D. students are expected to take responsibility for project components. A scholarship is included for the successful applicants.

Please visit <https://laurentian.ca/graduate-admissions> for information about how to apply. For more information about the EXO research program contact any of:

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