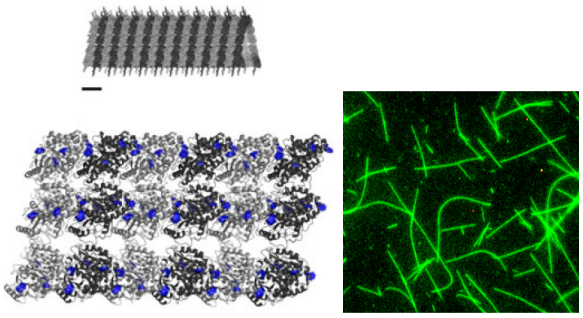
Concordia University
Arts and Science
Department of Physics

Graduate student position will be available, starting in the Fall 2023 / Winter 2024, in the group of Professor Valter Zazubovits, Department of Physics, Concordia University, Montreal, Canada.



Left: Microtubule architecture. Blue: tryptophane. Bar=10 nm. Right: microtubules labeled with fluorescent pigment.

We are mostly an experimental biophysics group whose research is focused on pigment-protein complexes involved in photosynthesis; we are employing optical methods and electrochemistry. In addition to doing research on photosynthesis per se (energy transfer, charge transfer), we are utilizing proteins from the photosynthesis context in the studies of low-temperature protein dynamics, small light-induced conformational changes, and biosensors for explosives. We are also interested in other natural and artificial pigment arrays resembling photosynthetic light-harvesting antennae.

Excitons in pigment arrays resembling natural photosynthetic antennae. Microtubules form the cytoskeleton of the cells. They are built from identical tubulin protein dimers. As a result, tryptophan amino-acids of the protein form periodic arrays of pigments (active in UV range; excitation will be delivered using upconverting nanoparticles) that are similar to photosynthetic antenna. We are looking for a graduate student who will be involved in spectroscopy / microscopy / single molecule imaging of microtubules, studying excitons, super-radiance and excitation energy transfer. These studies will be further supplemented by modeling as well as studying helical pigment arrays formed as a result of polymerization of tubulin labeled by fluorophores active in the visible range. Such arrays would be structurally similar to chlorosomes, one of the varieties of natural light-harvesting antenna.

Concordia Department of Physics is a growing department in a university with rapidly increasing rating. We offer research-based M.Sc. and Ph.D. programs. Our faculty members conduct research in the areas of Condensed Matter Physics (theoretical and experimental), Molecular Biophysics, Medical Physics / Imaging, Photonics, Theoretical High Energy Physics, Computational Physics and Physics Education.
Successful applicants will be offered financial packages consisting of RA, TA and various awards of at least 20,000 CAD per year (often more), for 4 years (Ph.D.) or 2 years (M.Sc.). International students will be offered tuition remissions or other awards to compensate for the international tuition fees.
Please contact Professor Valter Zazubovits; valter.zazubovits@concordia.ca for more information.