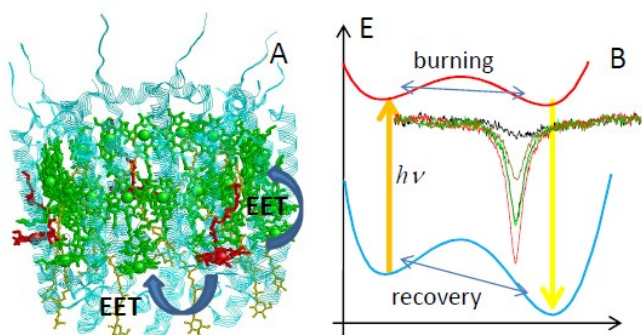


Graduate student position will be available, starting in the Fall 2020 / Winter 2021,

in the group of Professor Valter Zazubovits

Department of Physics, Concordia University, Montreal, Canada.



A: LH2 antenna complex; B: simple double-well representation of the protein energy landscape and examples of persistent spectral holes.

We are an experimental biophysics group and our 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.

Tunneling in biological systems and small light-induced conformational changes. Single molecule spectroscopy and persistent spectral hole burning offer information on protein energy landscapes and available conformational changes. These small conformational changes manifest in optical experiments as shifts of the spectral lines of the pigment molecules embedded into the protein. Over the years we have developed several software tools for modeling single-molecule spectroscopy and spectral hole burning data. It eventually became clear to us that approximations traditionally used in our field (tunneling through rectangular barrier; free-particle wavefunctions, etc) are too crude and more rigorous treatment of tunneling in biological systems is required. We are looking for a graduate student with primary interests in theoretical (bio)physics, computer programming and computations to implement more advanced approaches to modeling our experimental data and QM tunneling in general. The project involves collaboration with researchers at the University of South Carolina, USA.

Concordia's 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 (who is also the Graduate Program Director; valter.zazubovits@concordia.ca) for more information.