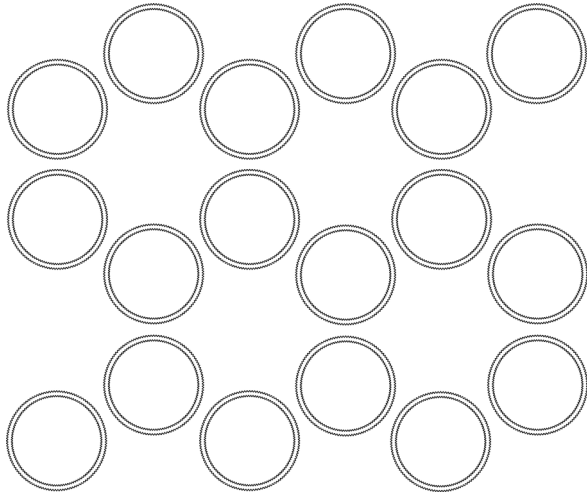


M.Sc. / Ph.D. student position will be available, starting in the Fall 2020 / Winter 2021 in the group of Professor Pablo Bianucci at the Department of Physics, Concordia University, Montreal, Canada.



In the Bianucci Research Group we investigate light, with particular interest in the interaction between light and matter and the trapping of light using microscale optical resonators. We perform experiments, use computer simulations, and apply theoretical models to understand the physics of light. Our current areas of research include cutting edge photonics, topological optics, optical sensors, and the growth and optical characterization of semiconductor nanostructures.

We have a vibrant research group, with international collaborations. Each student has their own project, and they present their results at regional, national, and international conferences.

We are looking for motivated students who are willing to take ownership of their projects. We believe that diversity is a strength of our research group, and take it seriously.

Designing and investigating photonic bilayer materials

When two layers of a 2D materials are assembled into a structure, rich new behaviors can appear, such as the superconductivity at the magic angle in bilayer graphene. Based on our research, we have found a way to control the coupling between propagating and counter-propagating resonant modes in photonic rings. By making lattices (such as a honeycomb one) with such rings we can create, in a single photonic layer, the equivalent of a bilayer system. By modulating the coupling along the ring array, we can emulate different bilayer angles and obtain moire patterns. This project involves using computer simulations to understand the band structure of these photonic bilayer materials, and to find out what new phenomena can be demonstrated with them. Once a good understanding of these photonic materials is reached, we will fabricate them and do experimental measurements to confirm the existence of these phenomena.

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 Pablo Bianucci (pablo.bianucci@concordia.ca) or Professor Valter Zazubovits, Graduate Program Director (valter.zazubovits@concordia.ca) for more information.