

## **Limited-Term Research Associate opportunity at the University of Toronto: Computational Materials Science.**

**Position.** The candidate will lead research projects in the area of Computational Materials Science outlined below. The successful candidate will bring proven expertise in the domain of computational materials science and many-body physics.

The principal goal will be first-authored publications in high-impact journals; accompanied with an expectation that the Research Associate will devote a fraction of time to co-mentoring graduate students in the group and developing new research directions. Candidates are expected to bring proven leadership in motivating and managing small teams; evidence of excellent organizational and time-management skills; excellent communication skills, including the capacity to offer thoughtful and clear technical guidance on research projects; and clear and efficient writing.

**Requirements:** The incumbent will lead in theoretical study and design of novel nanomaterials, focusing on optical and electronic properties, in particular excitation evolution under high pump intensity, and chemical reactions at the organic-inorganic interfaces. In collaboration with other members of the group, the Research Associate will characterize the properties of the materials used experimentally and provide guidance for the design of new materials with desired properties for applications in lighting/lasing, solar cells, photodetection and photocatalysis. The candidate will bring proven expertise in DFT and correlated systems modeling with sound understanding of semiconductor devices and chemistry, required for close collaboration with researchers in chemistry, materials science, and electrical engineering.

*Postdoctoral experience in the following is mandatory:*

- Many-body problems in systems with large amount of atoms (configuration interaction, GW)
- Quasiparticles (excitons) in correlated systems and their dynamics (Fermi golden rule, exact diagonalization, spectral function and time propagation techniques, density matrix)
- Charge transfer in photoexcited systems
- TD-DFT methods for optical properties in systems with spin-orbit coupling
- Surfaces and interfaces of oxide and semiconductor materials
- Parallel programming for supercomputer clusters
- Writing grant proposals and applications for experimental/computational resources

*Experience in the following areas will be considered a plus:*

- Photo-assisted reactions
- Modeling reactions and kinetic barriers
- Microscopic dielectric screening and random phase approximation

Applications should be sent by August 24, 2015, to Prof. Ted Sargent (ted.sargent@utoronto.ca) at the University of Toronto.

*The University of Toronto is strongly committed to diversity within its community and especially welcomes applications from visible minority group members, women, Aboriginal persons, persons with disabilities, members of sexual minority groups, and others who may contribute to the further diversification of ideas.*