



Vancouver's Offerings

Vancouver is recognized for its beauty, situated on a natural harbour sheltered on the North by snow-capped mountains. Vancouver is a vibrant city, and plays host to world class cultural, entertainment, and sporting events. There are limitless possibilities for outdoor pursuits, such as hiking, tennis, windsurfing, sailing, golf, rollerblading, fishing and mountain biking in the spring, summer and fall. Miles of sandy beaches are within walking distance from even the most populated districts. Stanley Park, which is adjacent to the downtown area, and Pacific Spirit Park, next to UBC, are two of the world's largest urban parks. Winter brings excellent skiing on the North Shore mountains, just minutes away from downtown Vancouver.

Whistler, North America's premiere ski resort, is within driving distance, a mere two-hour drive along the scenic Sea to Sky Highway.



Located in a spectacular setting at Point Grey, overlooking Howe Sound and Vancouver's Burrard Inlet, the University of British Columbia is one of Canada's largest and best-funded research universities. UBC's Department of Physics & Astronomy is noted for the excellence of its research, and can boast of having the highest academic standards and integrity of graduate programs offered in North America. Many faculty members in our Department have received national and international recognition for their research talents, and bring in over \$5 million in research funding annually. Our Graduate Students continue research and have become outstanding Scientists worldwide.

Atomic Molecular and Optical Group

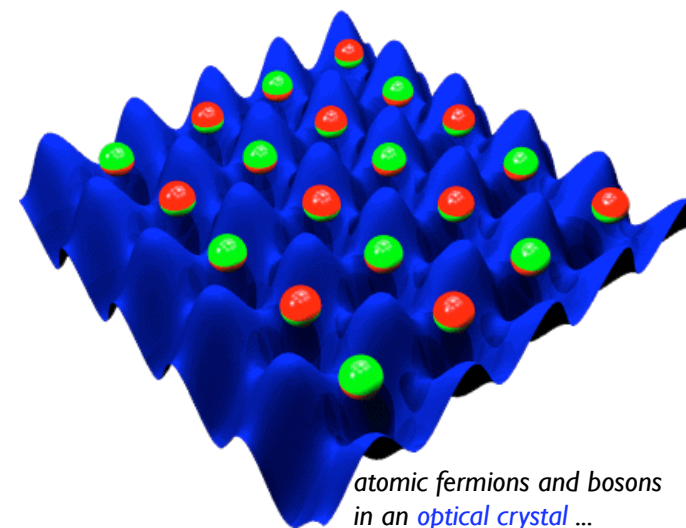
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University of British Columbia
Department of Physics & Astronomy
and Department of Chemistry

Atomic Molecular and Optical Group



atomic fermions and bosons
in an *optical crystal* ...
the new paradigm for ultra-
low temperature physics and
quantum simulators

Coherent control

Professor John Hepburn (E)

Dept. of Physics & Astronomy and Chemistry
quantum coherent control with ultra-short laser pulses, control of photo-ionization and photo-fragmentation of molecules, Raman spectroscopy and microscopy.

Professor Moshe Shapiro (T)

Dept. of Physics & Astronomy and Chemistry
coherent control of physical processes using light: photo-currents in semiconductors, biomolecular reactions, tunneling, nano-deposition, the creation of chiral molecules, and purification of mixtures.

cold molecules and plasmas

Assistant Prof. Roman Krems (T)

Department of Chemistry
dynamics of molecules in electromagnetic fields, scattering theory, cooling and trapping of molecules, spectroscopy, long-range interactions, angular momentum theory, theory of chemical reactions, ultracold chemistry

Professor Edward Grant (E)

Department of Chemistry
production of molecular Rydberg gases, and ultracold plasmas, study of structural and dynamical characteristics of molecular Rydberg gases and ultracold plasmas

Professor Takamasa Momose (E)

Department of Chemistry
production of ultra-cold molecules, spectroscopy of molecules in quantum condensed phases, investigation of quantum computation with molecules embedded in parahydrogen, observation of cold molecules in interstellar space.

The Atomic Molecular and Optical Group

...is comprised of Professors in both the Physics and Chemistry departments, and research in both theory (T) and experimental (E) AMO physics is conducted both at UBC and at TRIUMF, Canada's National Laboratory for Particle and Nuclear Physics.

*Recent contributions and innovations of this field have been recognized by **three Nobel Prize awards in Physics** to a total of 9 researchers in the past 9 years! As a testament to the recent progress, these awards were given for work done just within the last decade of 2000! This field is rapidly expanding and serves as the basis for most modern technological innovations.*

Photonics of Nanostructures

Professor Jeff Young (E)

Department of Physics & Astronomy
2D waveguide based-photonic crystals, optical properties of quantum wells, optically-detected spin-injection, distributed feed back lasers for analog optical communications

Professor Ruth Signorell (E)

Department of Chemistry
spectroscopic investigations of molecular nanoparticles, aerosols, and clusters

Laser cooling of radioactive neutrals and ions

Adjunct Professor John A. Behr (E)

Department of Physics & Astronomy
(Research Scientist, TRIUMF)
Laser traps for radioactive atoms, helicity of neutrinos, search for non-standard model interactions, time-reversal symmetry

Adjunct Professor Jens Dilling (E)

Department of Physics & Astronomy
(Research Scientist, TRIUMF)
Ion traps for radioactive short-lived exotic isotopes, precision mass measurements, test of Standard Model of weak interaction, nuclear astrophysics synthesis of the heavy elements in the universe.

Quantum degenerate gases

Assistant Prof. Kirk W. Madison (E)

Department of Physics & Astronomy
Laser and magnetic traps for Rubidium and Lithium atomic vapors, Bose Einstein Condensates, Fermi degenerate gases, quantum simulators, quantum phase transitions, ultra-cold molecules

Assistant Professor Fei Zhou (T)

Department of Physics & Astronomy
Theory of many-body quantum mechanics, study of spin ordered and topologically ordered quantum phases in ultra-cold atomic gases, quantum simulation and quantum phases

Femto-second optics

Assistant Prof. David J. Jones (E)

Department of Physics & Astronomy
ultrafast optics, femtosecond frequency combs precision spectroscopy of cold atoms and molecules, quantum control, EUV and X-ray lasers optical frequency metrology