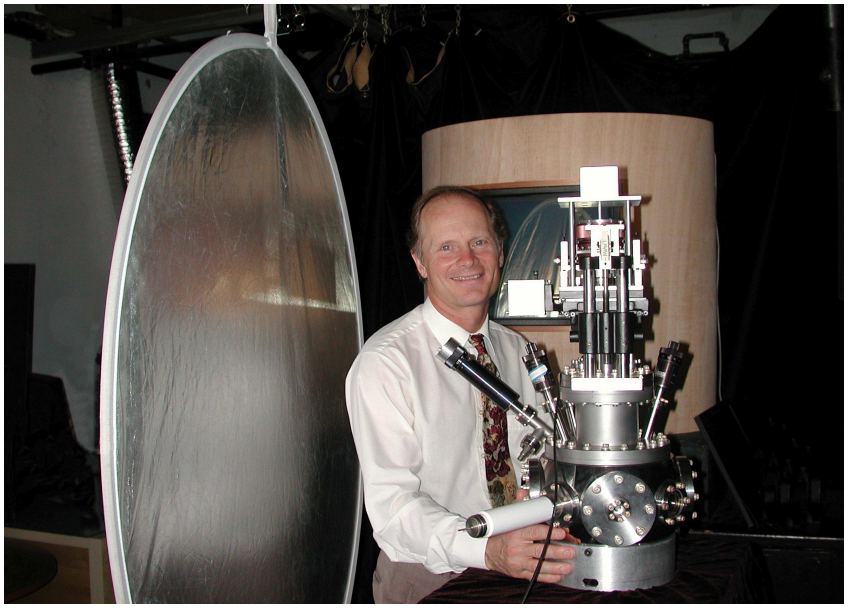

R. J. Dwayne Miller, and his "baby", the 3rd Generation Electron Gun that broke the picosecond barrier to atomically resolved structural dynamics, i.e. made the first "Molecular Movies" by virtue of its near single shot capabilities

R. J. Dwayne Miller, B. Sc. Honours University of Manitoba (1978), Ph. D. Stanford (1983), NATO Science Fellow Universite de Joseph Fourier, Grenoble (1983) has published over 165 research articles, one book, and several reviews. His research focus has been developing new ultrafast laser technology and spectroscopies that are aimed at providing an atomic level description of the primary events defining the structure-function of Biology. His research accomplishments have been recognized with an A.P. Sloan Fellowship, Camille and Henry Dreyfus Teacher-Scholar Award, Guggenheim Fellowship, Presidential Young Investigator Award, Polanyi Award, Rutherford Medal in Chemistry, and numerous named lectureships. He was inducted as a Fellow of the Royal Society of Canada in 1998. He currently holds the Distinguished Faculty Research Chair in Chemical and Biological Physics and is Director of the newly created Institute for Optical Sciences at the University of Toronto. He was appointed as a University Professor at the University of Toronto in 2008. He was awarded the Chemical Institute of Canada Medal in May 2009 for obtaining the first direct observation of atomic motions involved in structural changes, on the 100 femtosecond timescale relevant to the primary processes of chemistry.

Relevant Publications

R. J. D. Miller, "Energetics and Dynamics of Deterministic Protein Motion," *Accounts of Chemical Research* ***1994***, *27*, 145-150. .

B.J. Siwick et al., "An Atomic-Level View of Melting Using Femtosecond Electron Diffraction," *Science* **2003**, *302(5649)*, 1382-1385. First "Molecular Movie".

M.L. Cowan et al., "Ultrafast Memory Loss and Energy Redistribution in the Hydrogen Bond Network of Liquid H2O," *Nature* 2005, *434(7030)*, 199–202. Solved 100 year old problem in spectroscopy, provided directly the intermolecular couplings, introduced diffractive optics and nanofluidics for spectroscopy.

J.R. Dwyer et al., "Femtosecond Electron Diffraction: 'Making the Molecular Movie'," *Phil. Trans. R. Soc. A* **2006**, *364*, 741-778. Gives grand vision.

V.I. Prokhorenko et al., "Coherent Control of Retinal Isomerization in Bacteriorhodopsin," *Science* **2006**, *313(5791)*, 1257-1261. Opened new field of weak field coherent control/ issues of quantum coherence in biological systems.

C.T. Hebeisen et al., "Femtosecond Electron Pulse Characterization Using Laser Ponderomotive Scattering," *Optics Lett.* **2006**, *31(23)*, 3517-3519. Solved last technical hurdle to 10 fs resolution of atomic motions.

G. Sciaini et al., "Electronically Accelerated Atomic Motions in Bi," *Nature* **2009**. Atomic motions reveal an electronically driven bond breaking/ nucleation to a liquid in less than a half vibrational period (ballistic, fundamental limit). One of the fastest structural changes measured, rivaling the primary event of vision.