Professor Roy Glauber will visit the Institute for Optical Sciences from March 10 to 14, 2008 as part of the Institute’s Distinguished Visiting Scientists program.

Roy Jay Glauber was born in New York City, and attended public schools there. He was a member of the first graduating class of the Bronx High School of Science. He entered Harvard University in September, 1941, and attended classes there as an undergraduate for several years, before being invited in 1944 to join the Theory Division of the Manhattan Project at Los Alamos, New Mexico. He had the opportunity to work with or meet Robert Oppenheimer, Richard Feynman, Niels Bohr, Hans Bethe, and others during those war years. At the conclusion of the war, he returned to Harvard, worked with Julian Schwinger, and received a Ph.D. degree in Physics in 1949. After postdoctoral positions at the Institute for Advanced Study, and the Swiss Federal Institute of Technology in Zürich, working with Wolfgang Pauli, he spent a year as a lecturer at the California Institute of Technology before returning to Harvard as a lecturer in 1952 and then assistant professor in 1954. He became Professor of Physics at Harvard in 1962, and Mallinckrodt Professor of Physics in 1976. He is still teaching in Harvard’s Faculty of Arts and Sciences. He has been a visiting professor or scientist at CERN in Geneva, at the University of Leiden, at the Collège de France, at NORDITA in Denmark, and director of a session at the Enrico Fermi School in Varenna, Italy. He is author of more than 120 articles in refereed journals. He served on the editorial board of the Journal of Mathematical Physics and Nuclear Physics B. He is a fellow of the National Academy of Science, the American Academy of Arts and Sciences, and the American Physical Society, and is an honorary foreign member of the Royal Society of London and the New Zealand Academy of Sciences. He has received a number of awards from professional and scientific organizations, including the A. A. Michelson Prize of the Franklin Institute in 1985, the Max Born Award of the American Physical Society in 1985, an A. Von Humboldt Research Award in 1989, the Dannie Heineman Prize of the American Physical Society in 1996, and the Willis E. Lamb Medal for Laser Science and Quantum Optics in 2006. In 2005 he received one half of the Nobel Prize in Physics for his “contribution to the quantum theory of optical coherence.” Roy lives in Arlington, Massachusetts, and enjoys visits with his grandchildren, and his two children, Jeffrey and Valerie, and their spouses.

Professor Glauber will give 3 lectures during his visit, described below:

**A Century of Light Quanta**

**Monday, March 10, 2008, 4:30 p.m. – 5:30 p.m.**

**Bahen Building, Room 1160, 40 St. George Street**

The understandings we associate with quantum theory began a little over a hundred years ago with the discovery that light is divided into quanta that behave in some contexts like particles. When elementary particles were presently discovered to share the wave-like properties of light, the stage was set for the development of quantum mechanics. It was not until 1927 however, when the mathematics developed to describe the new theory was applied to the electromagnetic field, that we finally had a self-consistent theory of light quanta. The many detailed verifications of the theory that followed, were mainly confined to radiation processes involving only one or two light quanta. The theory of multi-quantum phenomena began to expand rapidly in the 1950s, and has been greatly accelerated by the development of the laser. We shall review the quantum theoretical meaning of optical coherence and discuss its relation to the statistical distributions of light quanta and to recent observations of the behavior of individual quanta.

**Radiation Damping in Atoms and Harmonic Oscillators**
The study of the decay of quantum states in the process of radiating light quanta has been undertaken in many contexts. The radiation process is in some ways a paradigm of irreversibility. We review some simple approaches to the problem and indicate its relation to a model of quantum amplification.

Cooperative Spontaneous Emission and Scattering of Light: A Theory of Coherent Radiation Damping

A quantum radiated by any one of a collection of identical atoms may be absorbed by others and re-emitted many times before it emerges. The radiation is thus best described as a collective process. It takes place only in certain favored modes that have a particular range of decay lifetimes and corresponding ranges of spectral level shifts and linewidths. The light that these atoms scatter resonantly also reflects this complex spectral structure.

The IOS Distinguished Visiting Scientists series is organized with financial support from the Ontario Centres of Excellence.

For more information on the lectures and on Prof. Glauber’s visit please contact Emanuel Istrate.