Some Comments from John C. Light

Over many years my research interests have changed but have remained largely in the area of quantum dynamics of small systems, reactive and inelastic collision processes, interactions of molecules with light and with surfaces, and the theoretical description of highly vibrationally excited molecules. The approaches have evolved from general, but approximate, theories such as the phase space or statistical theory of chemical reactions, to accurate numerical quantum calculations on small systems, reactive or bound. Often we tried to look at systems for which new approaches were required for solution. This led to new approaches for time-dependent calculations such as exponential expansions, short iterative Lanczos propagation, transition state wave packet methods, etc. We also developed new time independent quantum scattering methods based on R-matrix propagation and log derivative propagation as well as the purely square integrable "artificial boundary inhomogenity" approach.

The quantum description of molecules undergoing reactions, photodissociation, or other large amplitude motions required new representations, usually using orthogonal coordinates and flexible basis sets. The flexibility and simplicity provided by discrete variable representations (DVR's) and Gaussian bases have proven very useful for small molecular systems. These have been coupled with efficient methods of solution based on generation of efficient multidimensional representations using sequential reduction or energy selected bases with phase space optimization.

I have been very fortunate and I am greatly indebted to the graduate students and postdoctoral research associates with whom I have had the privilege to share essentially all of my research efforts. I learned much more from them than they did from me. It was always a pleasure to see students grow to the point of explaining their research results (very patiently) to me. With some this came very early, with others only after a couple of years, but I think, without exception, my Ph.D. students grew into excellent problem solvers, in science or in other endeavors. My Research Associates usually started by explaining (again, very patiently) to me what they would like to do and how and why we should do it. It has been a great pleasure to have worked with so many gifted people.

Over the years I also had a number of occasional but very fruitful collaborations with other scientists. These have included Kurt Schuler, John Ross, Abe Szoke, Jeff Krause, Rick Heller, David Manolopoulos, Stephen Gray and, over several years, Ken Kulander and Tucker Carrington, Jr., as well as my colleagues Laurie Butler and Steven Sibener. I also have greatly appreciated extended collaborations with former research associates Bob Walker, Zlatko Bačić, Ian Hamilton, Greg Parker, and Donghui Zhang. In addition, I have greatly benefited from stimulating conversations with my colleagues Stuart Rice, Karl Freed, Takeshi Oka, and Steve Berry and, of course, with my Editorial colleague Don Levy and my Ph.D. mentor and editorial colleague, Marshall Fixman.

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