Some Research Achievements.

1. Work carried out with B. Barker (LSU and U. of Alabama) on the precession of the spin of gyroscopes (a one-body problem) was extended to the derivation of the first detailed general relativistic investigations of both spin and orbital effects in two-body systems [Phys.Rev.D12,329 (1975)]. This work also introduced position operators into this area and formed the basis of many papers by investigators working on the observation of gravitational radiation in the LIGO and VIRGO experiments. In addition, our prediction of two-body spin precession, a new prediction of General Relativity, was recently verified by R. Breton et al. [Science 321,104(2008)] who observed a spin precession of 5 degrees per year in the double binary pulsar system, which is 43,000 times the perihelion precession of Mercury.

2. With R. Henry (LSU) and Jesse Greenstein (Caltech), showed that a well-known white dwarf has a very large magnetic field of about 300MG (that is over 100 million times the earth's field), which has an enormous effect on the Hydrogen spectrum and also enabled us to explain the origin of the Minkowski bands [Ap.J.289,L25(1985)] The subject of large magnetic fields in neutron stars and black holes is of continuing interest.

3. 4.Wrote 6 papers with Eugene Wigner, renowned Nobel Prize winner,, with one paper having nearly 3,000 references [Phys.Reports 106, 121(1984)].

4. Work with G.W.Ford (U of Michigan) and J.T.Lewis (Dublin Institute for Advanced Studies) over a period exceeding 25 years, has played a dominant role in my activities over my whole career. In general, it led to fundamental discoveries in Quantum Statistical Mechanics in addition to important work in Electrodynamics. In particular, Ford, Lewis and I wrote a pioneering paper on the Quantum Langevin Equation [Phys.Rev.A 37,4419 (1987)] which

demonstrated the broad generality of the use of quantum Langevin techniques for treating dissipative and fluctuation phenomena in quantum mechanics.

Also, in particular, Ford and I showed that the famous Onsager regression hypothesis (which states that the regression of fluctuations is governed by macroscopic equations describing the approach to equilibrium) fails in the quantum case and must be replaced by the fluctuation-dissipation theorem [Phys.Rev.Lett.77,798(1996). In addition, we also showed that decoherence could occur without dissipation[Phys.Lett.A286,87(2001)]. We also solved the long-standing problem of runaway solutions in the case of a radiating electron [Phys.Lett.A44,6386 (1991);Contemporary Phys.53,301(2012)];proved that the familiar result for the derivative of the hyperbolic tangent is actually missing a term which is the Dirac delta function [Nature 380,113 (1996)] and showed that the widespread acceptance of Unruh radiation is false because such radiation cannot exist [Phys.Lett.A 158, 31 (1991)].