1052-35-56 **Robert M Strain*** (strain@math.upenn.edu), Department of Mathematics, David Rittenhouse Lab., 209 South 33rd Street, Philadelphia, PA 19104. *Recent global results for the relativistic Boltzmann equation.*

We will discuss several recent results regarding the relativistic Boltzmann equation. The talk will start with a broad overview of relativistic Kinetic theory for non-specialists.

New results to be discussed include the previously open problem of stability of the Maxwellian equilibrium for the relativistic Boltzmann equation with soft interactions. The soft potentials are important for particles moving at relativistic speeds. We can also prove for the first time the global validity of the Newtonian Limit in the near Vacuum regime.

Additionally we can establish the rigorous connection between the Boltzmann equation and Relativistic Euler via a Hilbert Expansion, this is joint work with Jared Speck.

Furthermore, we consider the relativistic Boltzmann equation coupled with it's internally generated electric and magnetic forces. Despite its importance, no global in time solutions have been established so far for this Lorentz invariant model. We prove existence of the first global in time classical solutions. This project is joint work with Yan Guo. (Received August 15, 2009)