1134-35-356 **John Blake Temple*** (temple@math.ucdavis.edu), Department of Mathematics, University of California, Davis, Davis, CA 95616. *Causal Dissipation for the Relativistic Fluid Dynamics of Ideal Gases.*

(I discuss presenter's 2017 RSPA article, all joint work with co-author Heinrich Freistuehler). It has long been thought that there is no relativistic version of the compressible Navier-Stokes equations, (modeling dissipation by bulk and shear viscosity and heat conductivity), such that the system is causal in the sense that all wave speeds are bounded by the speed of light. Starting with the recognition that Navier-Stokes dissipation is only a leading order theory, together with the principle that fundamental equations of fluid dynamics should be symmetric hyperbolic, we prove that there is a unique sharply causal version of relativistic Navier-Stokes which is symmetric hyperbolic as a second order system when written in the natural Godunov variables that make the Euler equations symmetric hyperbolic as a first order system, such that the system is equivalent to the classical relativistic descriptions of Eckart and Landau to leading order in the coefficients of viscosity and heat conduction. Based on these properties, we propose this system as a natural candidate for the relativistic counterpart of the classical Navier-Stokes equations. (Received September 11, 2017)