1065-81-18 **Siavash H. Sohrab*** (s-sohrab@northwestern.edu), Northwestern Uinversity, Dept. Mech. Engin., 2145 Sheridan Road, Evanston, IL 60208. *Scale Invariant Statistical Theory of Turbulence and Hydrodynamic Foundations of Schrödinger and Dirac Wave Equations.*

A scale invariant model of statistical mechanics from cosmic to Planck scale is presented with particles that at thermodynamic equilibrium will have Gaussian velocity distributions, Planck energy distribution, and Maxwell-Boltzmann speed distribution. Physical space is identified as a tachyonic fluid that is stochastic ether of Dirac or "hidden thermostat" of de Broglie. Invariant Schrödinger equation and Dirac relativistic wave equation are derived. Compressibility of physical space is shown to result in Lorentz-FitzGerald contraction thus accounting for null result of Michelson-Morley experiment. The physical foundation of special theory of relativity is examined leading to two paradigms: (A) Poincaré-Lorentz dynamic theory of relativity with space and time (x, t) altered due to causal effects of motion on the ether (B) Einstein kinematic theory of relativity with Space and time (x, t) are altered due to the two postulates of relativity (1) The laws of physics do not change form for all inertial frames of reference (2) Velocity of light is a universal constant independent of the motion of its source. A scale-invariant definition of time is presented and it is shown that parallel to lengths time durations contract such that the speed of light remains invariant. (Received July 13, 2010)