Planck Mass Plasma Vacuum Conjecture

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As an alternative to string field theories in R10 (or M theory in R11) with a large group and a very large number of possible vacuum states, we propose SU2 as the fundamental group, assuming that nature works like a computer with a binary number system. With SU2 isomorphic to SO3, the rotation group in R3, explains why R3 is the natural space. Planck's conjecture that the fundamental equations of physics should contain as free parameters only the Planck length, mass and time, requires to replace differentials by rotation – invariant finite difference operators in R3. With SU2 as the fundamental group, there should be negative besides positive Planck masses, and the freedom in the sign of the Planck force permits to construct in a unique way a stable Planck mass plasma composed of equal numbers of positive and negative Planck mass particles, with each Planck length volume in the average occupied by one Planck mass particle, with Planck mass particles of equal sign repelling and those of opposite sign attracting each other by the Planck force over a Planck length. From the thusly constructed Planck mass plasma one can derive quantum mechanics and Lorentz invariance, the latter for small energies compared to the Planck energy. In its lowest state the Planck mass plasma has dilaton and quantized vortex states, with Maxwell's and Einstein's field equations derived from the antisymmetric and symmetric modes of a vortex sponge. In addition, the Planck mass plasma has excitonic quasiparticle states obeying Dirac's equation with a maximum of four such states, and a mass formula of the lowest state in terms of the Planck mass, permitting to compute the value of the finestructure constant at the Planck length, in surprisingly good agreement with the empirical value.

Key words: Planck Scale Physics; Analog Models of General Relativity and Elementary Particles Physics.