

Abstract Submitted  
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**The GEM (Gravity-Electro-Magnetism) Unification Theory and Cosmic Baryo-Genesis** JOHN BRANDENBURG, Orbital Technologies Corporation — Sakharov<sup>1</sup> proposed that in the early split-seconds of the Big Bang lepton and baryon number and CPT invariance were not conserved, resulting in the cosmos we know: dominated by hydrogen: protons and electrons, as opposed to their antiparticles. Accordingly, it is the premise of the GEM theory that out of Planckian “vacuum” quantities:  $G$ ,  $c$ , and  $\hbar$ : then emerge “particle” quantities :  $e$ ,  $m_p$  and  $m_e$  , the electron charge, the masses of the proton and electron respectively. In the GEM theory<sup>2</sup> the triggering event for the Big Bang is the appearance of the “compact” Kaluza-Klein 5<sup>th</sup> dimension, that breaks the symmetry of the Planckian vacuum and allows the separate appearance of both leptons from baryons, and EM fields from gravity. Assuming light-like vacuum intervals  $(x^2+y^2+z^2)-c^2t^2=0$  in normal spacetime mix with a string-like 5<sup>th</sup> dimensional vacuum  $r_o-r_o=0$  to form two space-like intervals  $r_o^2-(q_x^2+q_y^2+q_z^2)=0$  and  $r_o^2-q_o^2=0$  that are the proton and the electron respectively. Thus, charge is the 5<sup>th</sup> dimensional length in GEM and the lepton-baryon asymmetry reflects the time-space asymmetry of spacetime. A flat unstable vacuum results with hydrogen production from the vacuum in a “continually inflating” cosmos that satisfies the Dirac Large Numbers hypothesis.<sup>2</sup>

<sup>1</sup>Sakharov A.D. JETP 5,24, (1967)

<sup>2</sup>Brandenburg, J. E., (1995), Astrophys. and Space Sci., 227, p. 133

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