Implementing Maxwell's aether illuminates the physics of gravitation: the Gravity-Electric (G-E) field, evident at every scale, from Earth's ionosphere to galaxy dynamics without CDM, and an extreme at neutron stars for supernova explosions, cosmic rays and pulsars

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Relativity Theory (RT) incorporates serious inconsistencies:- (1) embracing the function of transverse e.m. waves as perfect messengers but denying the presence of a Maxwell's equations aether which, despite being essential for their existence, might invalidate that perfection; (2) assuming the physical absurdity that the external physical properties (mass, magnetic moment) of fundamental particles can be developed in zero volume ("spatially infinitesimal singularities"), despite powerful evidence that they are of finite size. It thereby overlooks that force communication between two finite-sized electromagnetically defined objects is progressively velocity-limited, falling to zero at $\boldsymbol{c}$ [1], so this is what happens in electromagnetic accelerators, not mass-increase. For more than a century these have hampered progress in understanding the physics of the mass property.

A rewarding substitute, **Continuum Theory (CT),** outlined here, (A) implements Maxwell's aether as a massless all-pervasive quasi-superfluid elastic continuum of (negative) electric charge, and (B) follows others [2 - 5] in seeing mass-bearing fundamental particles as vortical constructs of aether in motion. To encompass that motion, these cannot be infinitesimal singularities. Electron-positron scattering provides guidance as to that size. For oppositely-charged particles, one sort contains more aether and the other less, so particle-pair creation is 'easy', and abundantly observed, but has been attributed to 'finding'. This defines mean aether density as $>10^{30}$ coulombs/cm^3, constituting the near-irrotational reference frame of directional devices. It also offers an unfathomable force capability should the means for displacing its local density exist; that, we show, is the nature of gravitational action and brings gravitation into the electromagnetic family of forces.

Under (B) the particle mass is measured by the aether-sucking capability of its vortex, positive-only gravitation being because the outward-diminishing force developed by each makes mutual convergence the statistically prevalent expectation. This activity maintains a radial aether density gradient - the Gravity-Electric (G-E) Field - around and within any gravitationally retained assemblage. So Newton's is an incomplete description of gravitation; the corresponding G-E field is an inseparable facet of the action. The effect on $\boldsymbol{c}$ of that charge density gradient yields gravitational lensing.

G-E field action on plasma is astronomically ubiquitous. This strictly radial outward force on ions has the property of increasing the orbital angular momentum of material, by moving it outwards, but at constant tangential velocity. Spiral galaxies no longer require CDM to explain this. The force (about 100 V/m at solar surface) has comprehensive relevance to the high orbital a.m. [6,7] achieved in solar planet formation, to their prograde spins and to exoplanet observations [8,9]. The growth of high-mass stars is impossible if radiation pressure rules, whereas G-E field repulsion is low during dust-opaque infall, driving their prodigious mass loss rates when infall ceases and the star establishes an ionized environment [10]. Its biggest force-effect (~10^{12} V/m) is developed at neutron stars, where it is likely the force of supernova explosions, and leads to a fertile model for pulsars and the acceleration of 10^{19} eV extreme-energy cosmic rays. Finally, at ~4 V/m, it is seen in the Earth-to-ionosphere electric potential, whose temporary local changes have also been found to act as earthquake precursors, presumably by recording change of gravitational potential at Earth surface when its elastic deformation occurs.

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