A. Implementing Maxwell's aether illuminates the physics of gravitation, yielding galaxy dynamics without CDM, high-a.m. planetary systems, and how high-mass stars are built

Miles F. Osmaston The White Cottage, Sendmarsh, Ripley, Woking, Surrey GU23 6JT, UK (miles@osmaston.demon.co.uk)

Relativity Theory (RT) incorporates two serious inconsistencies:- (1) embracing the function of transverse e.m. waves as perfect messengers but denying the presence of a Maxwell's equations aether, essential for their existence; (2) overlooking that force communication between two electromagnetically defined objects is progressively velocity-limited, **falling to zero at** c (*Heaviside 1889*), so this is what happens in electromagnetic accelerators, not mass-increase. Both have hampered progress in understanding the physics of the mass property **for more than a century**. .

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 (1860-1960) 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'. 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 inverse square law 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 effect on c of that charge density gradient yields gravitational lensing.

G-E Field action on plasma is astronomically ubiquitous. This strictly radial outward force has the property, shared with radiation pressure, of increasing the angular momentum of outward-moving material, but at constant tangential velocity. Spiral galaxies no longer require CDM to explain this. The force has comprehensive relevance to the high a.m. achieved in solar planet formation, to their prograde spins and to exoplanet observations [*Osmaston, EPSC Abstr.* **4**, EPSC2009-264]. 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.**

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B. Continuum Theory (CT): implications of its continuous autocreation cosmology for the construction and morphological evolution of galaxies and clusters

Miles F. Osmaston, The White Cottage, Sendmarsh, Ripley, Woking, Surrey GU23 6JT, UK (miles@osmaston.demon.co.uk)

The findings of my adjacent poster "Implementing Maxwell's aether illuminates......." are:-
(A) Maxwell's aether is a continuum of extremely high **negative** charge density;
(B) fundamental particles are **not infinitesimal singularities** but are 'made out of it' as vortical constructs of its motion (hence the name Continuum Theory), so reproduction ('autocreation') of more of them is 'easy';
(C) **the result is that** Newtonian gravitation is accompanied by the presence of a radial electric field, the Gravity-Electric (G-E) field, whose action on plasmas is astronomically ubiquitous, yielding net repulsion without change of tangential velocity; so this pattern in spiral galaxies doesn't need CDM **if outward disk flow is present.**

Here I show **(Panel 1)** that if particles are 'made out of aether' the associated random aether motion generates the CMB and imposes four transmission effects upon electromagnetic waves, one of which - a distance-cumulative redshift - is the cosmic redshift and intrinsic redshifts in stellar and galaxy 'atmospheres'. So there was no BigBang. **(Panel 2)**

In the resulting no-expansion cosmology the entire mass content of the universe has grown from the aether's original random motion, by autocreation over time, whose local rate experiences positive feedback and acceleration as accumulations drive energy levels higher. Hence the clumpiness of galaxy distributions. Interestingly, **continuous autocreation** (CAC) cosmology is available near-by for direct study.

The infall of cosmogonically young material from the autocreation auras of clusters has 4 major implications.
(1) It completely inverts the BigBang perspective that low-metallicity material is very ancient.
(2) Low-metallicity Irregulars can illustrate the early stage of galaxy build-up and morphological evolution.
(3) Quasi-axial infall onto a Spiral will spread out in the galactic plane, driven radially from the ionizing bulge by the G-E field, maintaining constant tangential velocity. This pattern means that the arms, although trailing, are actually being blown outward (unwrapping) and ruptured by the disk wind, and act as filters for it.
(4) In cluster interiors, other cluster members may deflect the two infall streams **as they converge** onto a Spiral, introducing a dynamical rotational couple near the centre, with an axis roughly in the galactic plane, to produce a Barred Spiral. Cessation of infall then results in endwise collapse of that bar, yielding a fattened Elliptical.
Images and diagrams are presented in support and elaboration of (3) and (4).

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