Gravity

notes_on_gravity_waves.doc

notes_on_gravity_waves.htm

The Zero Point Field and inertia.doc

The origin of inertia:

http://physics.fullerton.edu/~jimw/general/inertia/index.htm

key/origin of inertia:

Google gravito-magnetic theory

gravito-magnetic vector potential

http://www.natscience.com/Uwe/Forum.aspx/relativity/5639/gravitomagnetic-potential

Sue

36. A. K. T. Assis, "Gravitation as a fourth order electromagnetic effect," In: Advanced Electromagnetism: Foundations, Theory and Applications, T. W. Barrett and D. M. Grimes (eds.), (World Scientific, Singapore, 1995), pp. 314-331. Abstract: We present a generalized Weber's law for electromagnetism including terms of fourth and higher orders in 1/c. These extra terms when applied to the force between two neutral dipoles yield an equivalent to Newton's law of universal gravitation as a fourth order electromagnetic effect. >>

Louis Nielsen

More than thirty five years ago I suggested a Maxwell-analogous gravitational theory with two gravitational fields. The two fields are the 'gravito-static' field of Newton and the 'gravito-magnetic' field, which is a gravitational vector rotation-field. The two fields exist around matter in relative motions.
In my treatise I show that the four field equations, which must be fulfilled by the 'gravito-static' field and the 'gravito-magnetic' field, are mathematical identical to Maxwell's electromagnetic equations.

I show that the four field equations and the 'gravitational

Lorentz-force equation' can be derived as a consequence of:

1) The gravito-static force law of Newton,

2) The transformation equations for positions, times, velocities, and forces as given in the special theory of relativity,

3) The assumption that the 'gravitational mass' is Lorentz invariant.

In the equations I introduce a quantity, the gravito-magnetic permeability' that is coupled to the 'gravito-magnetic' field. The gravito-magnetic permeability' has connection to the gravitational constant of Newton and the propagation velocity of the gravitational fields.
The velocity of propagation of the gravitational fields is assumed to be equal to the velocity of light.

According to my quantum-cosmological theory (see my treatise) Newton's gravitational 'constant' is not a constant but is decreasing along with the expansion of the Universe.
If the propagation velocity of the gravitational fields does not change in cosmic time then it has as a consequence that also the 'gravito-magnetic permeability' is a decreasing quantity along with the expansion of the Universe.
In our epoch the 'gravito-magnetic' fields are extremely small around moving bodies from daily life, and they are difficult to measure. But around massive bodies with high masses and great velocities there exist measurable 'gravito-magnetic' fields.
In earlier epochs of the cosmic evolution of the Universe the magnitude of the 'gravito-magnetic' fields were higher. As we look back in time to distant objects in the Universe, these objects moves in more and more intense and strong cosmic gravito-magnetic' fields, which give a lot of astrophysical consequences and which can give explanation of different observations.

You can study my mathematical derivation of the gravitational field-equations in part 6 of my treatise:

http://www.rostra.dk/louis/

Kjere Øystein:
The equations are known as the Maxwell equations for the gravitoelectromagnetic (GEM) fields and were first derived around 1870. The "magnetic" component were then adjusted to explain the perihelion precession of Mercury. GEM can also be derived from the weak field limit of general relativity, which was done at least 50 years ago. Your equations are pretty close:
- The right hand side of equation 51 and the left hand side of equation 53

should be multiplied with 1/2.
- There are two errors on the right hand side of equation 53. Remove the factor g and change the plus sign to a minus sign and the equations are equal to GEM.

Tom Roberts:
Hmmm.

In GR the "gravitometirc potential" is merely an approximation, based on an ANALOGY with Maxwell's equations of electrodynamics.

Note in Maxwell's equations A is not always in the direction of j -- you can take any scalar function \phi and add grad \phi to A, so clearly you can make A point in any direction whatsoever. Of course you must subtract d\phi/dt from the scalar potential when you do this, in order to keep the E and B fields unchanged. This is known as a "change of gauge" or a "gauge transform".

http://iopscience.iop.org/1402-4896/78/4/045004;jsessionid=0D9C28284372CB2660D53F2963AB8E2A.c1
Exact solutions to the time-dependent Schrödinger equation that governs the spiral motions of spinning particles are obtained, and the geometric phases that can be written as path integral of the vector potential of gravitomagnetic monopole (dual mass) are studied. Two illustrative examples of the confined spinning particles (e.g. a photon moving in a helical fiber and an electron confined by a planar radial electric field) are considered. It is shown that the confined spinning particles undergoing spiral motions seem to move inside a gravitomagnetic field produced by an equivalent gravitomagnetic monopole, i.e. the wavefunctions in the spiral motions of confined spinning particles acquire geometric phases, which are equivalent to the phase shift of a zero-spin particle that moves in the vector potential of a gravitomagnetic monopole. This means that the spiral motions of the confined spinning particles in proper potential fields can be used to simulate the gravitomagnetic vector potentials of dual mass. Though there is at present no evidence for the existence of gravitomagnetic monopole, the work presented here may stimulate interest in some areas such as the gravitationally induced quantum effects (relativistic quantum gravitational effects).

Abstract: Using the weak field approximation, we can express the theory of general relativity in a Maxwell-type structure comparable to electromagnetism. We find that every electromagnetic field is coupled to a gravitoelectric and gravitomagnetic field. Acknowledging the fact that both fields originate from the same source, the particle, we can express the magnetic and electric field through their gravitational respective analogues using the proportionality coefficient k. This coefficient depends on the ratio of mass and charge and the ratio between the electromagnetic and gravitic-gravitomagnetic permittivity and permeability respectively. Although the coefficient is very small, the fact that electromagnetic fields in material media can be used to generate gravitational and gravitomagnetic fields and vice versa is not commonly known. We find that the coupling coefficient can be increased by massive ion currents, and electron and nuclear spin-alignment. Advances in material sciences, cryogenic technology and high frequency electromagnetic fields in material media may lead to applications of the derived relationships.
http://www.journaloftheoretics.com/Articles/3-1/tajmar-final.htm

Linearized gravity is an approximation scheme in general relativity in which the nonlinear contributions from the spacetime metric are ignored, simplifying the study of many problems while still producing useful approximate results.
http://en.wikipedia.org/wiki/Linearized_gravity

GR has to reduce to Newtonian gravity in the low velocity, weak field limit to be a consistent theory.
http://www.physicsforums.com/showthread.php?t=128005