A Note on Dark Matter and Dark Energy

Lucian M. Ionescu

December 22, 2022

Abstract

The hypothetical dark matter and dark energy play the role of sources of gravity, supplementing what General Relativity predicts based on the observed masses in the Universe.

This brief note accounts for this additional G-force / potential based on the Theory of Gravity of quantum origin, emerging from the quark structure of matter.

This supplemental gravity is due to the presence of fractional charges of quarks, which yield different interaction strengths depending on the polarization of spin directions of neutrons and protons. In the presence of high intensity magnetic fields of rotating systems (neutron stars, galaxies etc.) the change in polarization of spins affects the intensity of the gravitational field. Note that such a dependence cannot be accounted for my GR via only the metric of space-time. This is consistent with theories of Modified Gravity on fiber bundles, including spin for instance, as effective theories of Gravity without black matter and black energy.

1 Introduction

Cosmological data regarding the observed mass and energy in a Galaxy is inconsistent with the dynamics of galaxies [1] and large scale structure of the Universe, as modeled by General Relativity (GR). The additional gravitational force inferred from the observed dynamics is generally attributed to the hypothetical dark matter and dark energy, otherwise invisible and not observed in the lab or particle accelerators.

One implementation of DE/DM at the level of GR is achieved via the so called *primordial black holes* [1].

Modified Gravity theories use a different connection then the Levi Civita connection in GR, taking into account the spin of particles, but without a motivation regarding why these would account as sources of gravity, except via the corresponding energy.

2 DM/DE via Black Holes

The nature of DM / DE is attributed to *primordial black holes*, of very small size. They are not observed directly, but their passage through Earth is conjectured to produce different types of craters with steeper angles as their signature. Natural phenomena would alter their geometric shape making their identification elusive. A search of such craters on Moon was conducted, but unfortunately these cannot be distinguished from micro-meteoric craters, as viewed from Earth.

Note at this point that the "modern blackholes", do not resemble anymore the initial concept as exemplified by Schwarzschild solution of Einstein's equation; they are bright objects, subject to quantum laws (Hawking) etc. having a complicated observed phenomenology.

Recently, Quantum Computing experiments and simulations have established teleportation of states interpreted as transfers of qubits via "wormholes", joining two blackholes. These are associated to entangled ions representing correlated qubits [6]. The novelty is the introduction of a new "element of reality" connecting two entangled particles, and providing a new light on the classical EPR paradox.

This interpretation does not claim that actual blackholes are produced, due to a curvature of space-time as in GR [7]. The present author suggests that such channels of quantum information are ubiquitous in many other experimental setups, e.g. double slit experiment, beam splitters optic experiments etc., as explained further in the concluding section.

Hence knowledge of elementary Particle Physics will turnout to be essential in understanding such objects like neutron stars, pulsars, quasars and blackholes.

3 Modified Gravity Theories

MGT refers to a wide class of alternative theories of Gravity, using two metrics or vector and frame bundles with connections to include additional contributions to Gravity, to account for the cosmological data beyond the predictions of GR, without the use of DM/DE. One notable example is Einstein-Cartan Theory of Gravity which includes spin-angular momentum contributions. Note that Barnett and Einstein-de Hass effects relate magnetic fields and rotations, hence involving the spin orientations as the source of magnetic fields. This contribute to the tensor matter-energy that may provide additional sources for Gravitational field.

These theories are "effective theories", without an explicit reference to the quantum structure of matter as provided by the Standard Model of Elementary Particle Physics.

4 Theory of Gravity of Quantum Origin

Gravity is of quantum origin and it is not a fundamental interaction, i.e. a force independent of the other fundamental interactions stipulated by the SM.

The main idea is that quarks, with their fractional electric charges, are not independent particles with pointwise electric fractional charges. Rather they form a complex 3D-object as a source of a field that is not isotropic (breaking $SU(2)$-symmetry to Platonic symmetry with a unified field with $++-$ or $+--$ index / signature. For example, the neutron has a unified field with two directions as sinks and one direction as a source when probed with electrons, revealing a structure beyond what classical EM is capable of modeling.

In fact Gravity is a weak correction to the EM force due to the configuration of fractional charges of quarks in baryons, essentially protons and neutrons, which is characterized by their spin directions. The orientation of this correction force is spin direction dependent. Its bias from a null correction term to Newtonian gravity force, distance dependent only, corresponding to a random distribution of spin directions in a body, is due to a polarization minimizing the energy. This term yields the effective force we call Gravity, much weaker then the spin-spin coupling term of quantum gravity.

This approach to gravity predicts an increase or diminishing Gravity according to the specific polarization of spins of quarks in baryons.

Another effect is the alignment of 3D-frames RGB of baryons hypothetically yielding "tubular filaments", a string of spin aligned baryons with special interaction properties (conductors of EM / Nuclear Force fields) [5], reminiscent of superfluidity and superconductibility, phenomena due to a higher level of order and global symmetry.

The data from rotating Galaxies supports the increase of G-field beyond the observed mass as a source of gravity, and this is attributed to the change in G-field due to spin polarization. This process reorients the quark spins and the resulting interaction between the fractional charges of two such baryons changes the second order correction of the resulting force, which is responsible for gravity. This is consistent with MTG, and can be modeled without an express knowledge of quark structure, and of course, without DM/DE.

5 Conclusions and Further Developments

Modern physics starts to acknowledge gradually that the Universe is in fact a Quantum Network, and entanglement is due to an actual interaction channel, as a bridge between the two "particles". These may seam "space separated", but the quantum tunnel, interpreted as a wormhole in the context of GR, is a short-cut; it is know said that "any two points of the Universe are (may) be linked", compatible with other phenomena studied by science: telepathy, correlation mother-child, mind influence over random generators etc.

This Network Model of quantum systems unifies fermions and bosons, as channels through which quantum information propagates. It is reminiscent of particle-wave duality and de Brogly interpretation via pilot waves. In this way experiments like the double slit experiment, Aharonov-Bohm effect, delayed choice and quantum erasure gain a simple, meaningful interpretation.

Overall micro and macro phenomena are qualitatively alike, well modeled by Quantum Mechanics and Quantum Computing, together; they also behave in a similar way under observation. For example, atoms have fermionic orbitals and a double slit experiment has a fermionic channel, topologically a

2-punctured genus one Riemann Surface, which collapses at the point of measuring revealing which way the "particale" went.

This also provides a direct way to quantize fields as discrete structures (Quantum circuits), although there are various alternatives for modeling the "elements" of a quantum circuit (QC vs. GR).

Space is rather a convenient artifact for modeling such an embedded Network, for classical interpretation purposes and to relate with experiment and our intuition; but then the metric and distance is not compatible with the "propagation" within the Network.

Time is, of course, only locally defined (Feynman's clock interpretation of the quantum phase $e^{i\omega t}$ playing the role of Einstein's clock, and the 3D-quark frame of the Block sphere of a qubit as the unit of space). Anti-particles are bosonic excitations in fermionic loops (conform Feynman-Stuckelberg interpretation), explaining why we don't see anti-matter in the Universe.

The Theory of Gravity of quantum origin has been qualitatively established from Elementary Particle Physics, beyond the SM, and it has been verified experimentally in the Lab [2, 3, 4]:

1) Alzofon's effective theory of gravitational potential modeled as heat reflects the dependents of gravitational force on the statistics of spin orientations of quarks in protons and neutrons;

2) Alzofon's experiments in the lab, proved the weight of an aluminum probe can be decreased using Dynamical Nuclear Orientation;

3) The author's Theory of Gravity from quantum origin, attributes Gravity force as a correction term to EM, due to spin orientation of quarks. This is due to the break of $SU(2)$-symmetry of the long-range baryonic field corresponding to the orientation of the system of fractional electric charges of quarks, its sources and sinks;

4) lab experiments that confirmed that Gravity of quantum origin obeys essentially the qualitative aspects of EM, including induction via coupled rotating masses ("transformars").

What remains to be done in order to have a quantitative precise theory:

1) The formulation of a generalized Coulomb Law, including spin orientation (on spin frame bundles) [1]. This may also benefit from the already existing MTG on frame bundles as a general framework[2].

2) Adaptation of Maxwell's Equations, which are a general framework for force fields $SO(3)$-invariant, to account for the brack of symmetry and the index of the baryonic field (the three correlated sources / sinks presently labeled as "quarks" with fractional charges).

Moreover, the above Theory of Gravity Control is consistent with other aspects reported in various sources of information [5]. Note that this are the output of main stream research in the corresponding areas of study, validated by the relatively recent disclosure of governmental sources of information.

Remaining at the level of scientific models, it can also explain the additional source of Gravity in Cosmology, without the elusive concepts of DM/DE, which have no place in the SM of Elementary Particle Physics. The direct way to implement this theory is by relating quantum spin of quarks and MTG.

More importantly, the Theory of Gravity of quantum origin opens the technology of Gravity Control for Alternative Propulsion Methods, on Earth, Solar System and beyond [5].

Although these new ideas are scattered in the literature, having perhaps quite a considerable history, and able to provide a new paradigm in science, they will not eliminate the various traditional theories, rather complement them at various levels of expertise and "clearence". The education system is structured on a "need-to-know basis" and so is academia, with its connections with research facilities, industry, etc.

References

[1] Matt Caplan, Collisions of Primordial Black holes and Solar System Bodies, presentation at Math Dept. Colloquium Fall, Nov.10 2022.

[2] L. M. Ionescu, Prospects of a Unified Field Theory including Gravity, https://vixra.org/abs/2104.0156

[1] Knowledge of Strong Force and gluons as mediators is not necessary, yet may provide a template for such a Tensorial Coulomb Law.

[2] yet a modified GR version is not necessary at this stage.

[3] L. M. Ionescu, Alzofon-Ionescu Theory of Gravity and Gravity Control, https://vixra.org/abs/2106.0056

[4] L. M. Ionescu, Quantum Gravity and Gravity Control, https://vixra.org/abs/2108.0045

[5] L. M. Ionescu, Gravity Control and Quantum Physics, presentation for the Secret Space Program Conference Bussines Applications, Silicon valley - San Jose, Sept. 2022.

[6] N. Walchover, Physicists Create a Holographic Wormhole Using a Quantum Computer, Quanta Magazine, Dec. 2022, https://www.quantamagazine.org/physicists-create-a-wormhole-using-a-quantum-computer-20221130/

[7] Whitney Clavin, Physicists observe wormhole dynamics using a quantum computer, caltech.edu/about/news/physicists-observe-wormhole-dynamics-using-a-quantum-computer

[8] D. Griffith, Introduction to Elementary Particle Physics, 1987.

[9] F. Potter, Unification of Interactions in Discrete Spacetime, Progress in Physics, Vol.1, Jan. 2006, pp.3-9.

[10] D. Sarkadi, Dynamic gravity experiment with physical pendulum, https://vixra.org/pdf/1809.0172v1.pdf

[11] Jeffreis D. Carson, Dynamic Nuclear orientation, 1963.