RENAMING DARK MATTER:
AN ELEGANT SOLUTION THAT
MERGES CONDENSED GRAVITATIONA FIELDS
WITH COSMOLOGY

Essay by Gene A. Harvey

ABSTRACT

Condensed Gravitational Fields, (CGF), extends the Universal Gravitational Constant of Einstein to incorporate similarities with the other three forces into a concept that provides a different and potentially more elegant explanation for the observed anomalous velocities in galaxies, which have traditionally been attributed to the presence of dark matter.

If one considers that gravity, (like the other three forces), strengthens, (or condenses), in and around mass and matter, then it is possible to reevaluate Dark Matter as a consequence of that strengthening. Very similar to magnetic fields, gravity gets stronger around matter. (Recall the "Inverse Square Law" which is fundamental to both Newton and Einstein theories.).

Using the equations from my previously published paper, I modify them in such a way that explains this condensing of gravity while forcing those grains apart.

Here are the modified equations:

Modified Einstein Gravitational Constant (κ):

$\kappa=8\pi G/c^4$

Modified to:

$\kappa = \Lambda c^4/8\pi G$ x Condensation Factor

This condensation factor accounts for the strengthening of gravity around matter, causing a local increase in the gravitational constant.

This condensation factor will also necessarily vary with each galaxy studied and is a function of anomalous velocities, radial velocity, and Newton's Conservation of Angular Momentum.

Modified Cosmological Constant (Λ)

$\Lambda=3c^2/8\pi G \times (lp*)^2$

$\Lambda=3c^2/8\pi G \times (lp*)^2$ x Condensation Factor

This modification incorporates the influence of gravity condensation on the cosmological constant, affecting the overall dark energy density.

Modified Vacuum Energy Density (ρ):
$\rho = \hbar c2/2\pi$ x Λ

Modified to:
$\rho = \hbar c2/2\pi$ x Λ x Condensation Factor

This modification accounts for the condensation effect in the Quantum Field Theory equation, aligning it with the overall CGF concept.

These modifications introduce a condensation factor that scales the gravitational constants and dark energy properties based on the local density of matter, providing a more nuanced understanding of the interplay between gravity and dark energy in the CGF model.

General relativity, which is the foundation of our understanding of gravity on cosmological scales, is described by the Einstein field equations:

$$G_{\cancel{\mu\nu}} + \Lambda_{g\mu\nu} = 8\pi G/c^4 T_{\mu\nu}\cancel{,}$$

where $G_{\mu\nu}$ is the Einstein tensor, $\Lambda_{g\mu\nu}$ is the metric tensor, Λ is the cosmological constant, G is the gravitational constant, c is the speed of light, and $T_{\mu\nu}$ is the stress-energy tensor.

These equations, in their standard forms, are used to describe gravitational interactions at different scales, including galaxies. The challenge arises when the observed velocities and motions of celestial objects deviate from what is predicted by these equations, leading to the proposal of dark matter as an additional gravitational influence.

To summarize the key highlights of the Condensed Gravitational Field (CGF) model:

1. **Firm Foundation in General Relativity (GR):** The CGF model builds upon Einstein's General Relativity, seamlessly fitting into the existing framework of gravitational physics.
2. **Gravity Condensation:** CGF posits that gravity strengthens or condenses around massive objects, akin to the behavior of other fundamental forces. This aligns with observations and the Inverse Square Law fundamental to gravitational theories.

3. **Dark Matter as Condensed Gravity:** The model proposes that what has been traditionally attributed to dark matter can be explained as a consequence of gravity condensing around matter. This eliminates the need for introducing new particles, (such as Wimps,Ws or Zs or even Axions). Likewise, the model eliminates most theoretical constructs.

4. **Testability:** CGF offers testable theories. Observations of gravity around massive structures should vary with proximity and mass, demonstrating the predicted condensation effect. As well as that the distribution of mass directly correlates to the condensed field.

5. **Alignment with Standard Models:** The model aligns with standard particle physics models, seamlessly incorporating gravity into the existing framework without requiring the introduction of new particles like the hypothetical graviton, or any variant of quantum gravity.

6. **Prediction of Dark Matter Distribution:** CGF predicts that dark matter, or the condensed gravitational field, will be found predominantly around massive objects. This aligns with observations indicating dark matter concentrations in and around galaxies.

7. **Massive Object Influence:** The model predicts greater concentrations of CGF around galaxies with Supermassive Black Holes (SMBs), potentially explaining the correlation between dark matter concentration and the presence of SMBs.

8. **Universal Reach of Gravity:** By describing gravity as a condensed field, CGF aligns with the observed universal reach of gravity, making it effective on cosmic scales.

9. **No Need for Graviton:** CGF provides an alternative explanation for the behavior of gravity without necessitating the existence of a graviton, which has not been observed.

10. **Seamless Integration into Existing Models:** The model integrates well with the Standard Model of particle physics and provides a conceptual framework that unifies gravity with other fundamental forces.

It's important to note that, (for this CGF model), that rigorous testing and observational verification would be crucial. It goes without saying that many scientists may need to design experiments or analyze existing data to see if the predictions of the model align with real-world observations. This process is a standard part of the scientific method to validate or refine theories.

Reference: https://vixra.org/pdf/2309.0002v1.pdf