# Of Matter: Light and Dark

**Aran David Stubbs**

Matter can be viewed as anything with rest mass. Visible matter is anything that can absorb, reflect, or emit visible light. From that perspective, the bulk of the universe is not visible matter. A popular explanation of this phenomenon is the existence of "dark matter". While normal matter absorbs and emits light in the visible spectrum, this dark matter typically does not. Many theories have been proposed to account for this invisible matter, this is a new one. Even more than my other work, this paper is highly speculative.

Based on my theories of the nuclei of normal matter atoms being comprised of monoquarks and diquarks, the possibility of triquarks immediately arises. Since there are only 3 "colors" of quarks, and long lasting wavicles only form when all 3 are present, the tri-quark would be unreactive. That is, a triquark would not bind to either a diquark or a monoquark, whatever their color schemes.

Since the triquark has not been observed, it can be assumed to have low mass and no charge (as wavicles with significant mass or any charge are quite noticeable). The down, down, up triquark would fill these requirements. Based on the low mass of the pion, which has 2 quarks and around 135 MeV, a triquark could easily have less than 200 MeV of effective mass. If the binding energy is high, the proto-quarks that comprise it could be moving well below c (say .7, which is near the minimum for a stable solution). Under those conditions, the triquark would have a diameter near 10 femtometers. It would act as an ideal gas, with no tendency to liquefy even at low temperatures and high pressures. Escape velocity is quite low, so the density around hot objects such as planets and suns would be low.

In deep space, the concentration would be much higher, especially in the outskirts of galaxies where gravitational attraction pulls them inward, and light pressure and the solar winds push them out.

If the wavicles are 10 fm in diameter, they cannot absorb photons much above 50 fm wavelength. This is hard gamma territory. A gamma of sufficient energy hitting a dark matter wavicle (hereafter referred to as a Negron), would accelerate it to a large fraction of the speed of light. Eventually the Negron would hit another Negron, or a stray Hydrogen nucleus, and transfer some of its energy.

Several possible arrangements would produce negrons. There can be 3 proto-quarks orbiting a pair of gravitons. There can also be a proto-diquark and a proto-quark orbiting a pair of gravitons. Finally, there can be a proto-triquark orbiting a pair of gravitons. Since the proto-triquark has 3 color bits (causing rest energy), but no net color, it is not affected by chroma-centripetal forces, so does not appear to be stable. The other 2 cases are more likely.

A trio of proto-quarks would have a trio of white proto-diquarks orbiting above them (since each has net color). This would give a total of 9 units of color and about 20 MeV of rest energy among the pieces. A proto-diquark and a proto-quark would similarly each have white diquarks orbiting above them. This could lead to either 6 or 9 bits of color (14 to 20 MeV of rest energy).