

# **THE DARK SIDE OF PHYSICS & THE NEW SPRING THEORY**

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Yes, Physics too has a dark side to it! The dark side of Physics refers to the two most popular yet unexplainable terms in Physics- dark matter and dark energy. According to researchers, 95.4% of our universe is made up of dark energy and dark matter, and what makes them mysterious is the fact that they are neither visible, nor interactive. Only their effect is felt.

We are all familiar with the fact the gravitational force is an attractive force. Thus, earlier scientists believed that due to all the attraction, the universe will eventually contract and collapse. But later, the data provided by telescopes showed a redshift in the images of distant celestial bodies. This could have meant only one thing: the universe was expanding, and moreover, the expansion was accelerating! Scientists were bewildered. Considering the observations, they finally reached a conclusion that some “special kind” of energy is present in the entire space which is causing the universe to expand. This “special kind” of energy was termed as Dark Energy.

Dark Energy is invisible, does not interact at all, though it can be detected. The concept forced scientists to consider a question they were trying to dodge: Is empty space really empty? The question makes sense, because the concept of dark energy proves that empty space contains a huge amount of energy which is accelerating the expansion of universe. Hence, dark energy is also termed as the “Energy of Nothing” as it is the energy of empty space.

Dark Matter Ring can be observed due to gravitational lensing. When scientists started observing several galaxies, they found out that some galaxies were moving with a much higher speed than what their actual mass would permit. This startling discovery had only one possible explanation: there is some missing mass in these galaxies, which we cannot see or detect. This “missing mass” was later named by scientists as Dark Matter. It is invisible, but unlike Dark Energy, the gravitational pull of dark matter can be easily observed.

Now, dark matter and dark energy are entirely invisible. They do not interact with any form of known matter, though the gravitational effect of dark matter is felt and "gravitational lensing" is an example of its visible effects. The first picture shows what causes gravitational lensing and the second picture shows its effect. The arcs you see are because of gravitational lensing.

Dark matter is attractive in nature and dark energy is repulsive, and that is all that we know about them. One more thing, there are millions of dark matter particles going past us, through us, through the walls, through the earth, every second, and we just don't feel them, again because they do not interact with anything!

While investigating the mystery of dark energy, I have come up with a theory called the Spring Theory (not to be confused with the very popular String Theory). According to this theory of mine, let us assume

that spacetime fabric is elastic in nature. Then, before the Big Bang, it was all compressed into one small particle just like a compressed spring. Now, as soon as the particle “banged”, the fabric just like a compressed spring started accelerating. If the motion of a spring is observed, it is seen that a particle attached to a spring accelerates till the spring has reached its natural length and after that, the particle begins to decelerate. Similarly, the expansion of fabric is accelerating at present, meaning to say, that the fabric has still not reached its natural length. Thus, according to the Spring Theory, since we are comparing the spacetime fabric to a spring, then Dark Energy is nothing but the potential energy of the spring, something very less mysterious than the Dark Energy itself.

The theory also proposes, though indirectly, the fact that the Universe will have a center. This is contrary to popular belief. But, what should be understood is that the Universe is said to have no center just because every particle is moving away from every other particle. Meaning to say, if you choose any point in this Universe, you will observe that all the other points are moving away from it. Hence, every point in the universe acts as a center of expansion. But, if we proceed by the explanation of expansion that my theory proposes, the same fact is observed.

Now let us talk about what the theory will imply. The theory implies that the universe is undergoing accelerated expansion till the time the spacetime fabric reaches its natural length, after which it will undergo decelerated expansion finally coming to rest with a certain maximum radius. Then the universe will begin to contract, just like a stretched spring, and will soon end up in a small particle, from where it started. Another major phenomena explained by the theory is the drifting away of Earth from Sun, the Moon from Earth, and so on. If the spacetime fabric is expanding, the curvature made by celestial bodies will decrease with time, hence decreasing their gravitational pull. This will directly result in the decrease in gravitational pull of all celestial bodies, the Sun, the Moon, the Earth, etc. and hence they will gradually drift away from each other.

The Spring Theory is just a hypothesis which I formulated to simplify the concept of Dark Energy, and is nowhere near proven. But, it does give us a different perspective towards explaining the mysterious phenomenon of this ever-so-mysterious Universe.

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