Why a Stressed Universe is the correct model of our universe

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Abstract

Originally most people simply imagined that the universe was a steady state system. Then Hubble discovered experimentally that it is expanding. The Big Bang has become the favoured explanation for this expansion. Dark matter seems to augment gravity to hold galaxies together. More recently, dark energy has been suggested as the driving force for the acceleration of the expansion. However, dark matter and dark energy remain elusive. A better model of the universe is needed to explain all the large-scale characteristics of the universe. That model is a Stressed Universe [1].

Introduction

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Background

The Big Bang theory has been extraordinarily successful in describing the universe we see today. But parts of this model are incredibly difficult to comprehend, such as it all starting from essentially a singularity. And it doesn't explain dark matter, dark energy, or the accelerated expansion that is being so carefully observed and measured today.

Einstein initially believed that the universe was static until he met with Hubble and saw evidence that the universe was expanding. When one reads the many evidence-based analyses that indicate that the universe started with a Big Bang and is expanding, it is pertinent that they have been developed by competent scientists who used accepted scientific laws. It is convincing that their proofs could possibly explain how a particular universe did develop from a Big Bang, but it is not really proof that other models are necessarily excluded, and that another model might not better explain our universe. The next section presents a Stressed Universe as a better model, and shows why it explains our universe better than does the Big Bang model.

New Model

Astrophysicists don't usually consider stressed structures to have much relevance to stars, galaxies and the expanding universe. But the author of this new Stressed Universe has spent his entire career engaged in understanding dynamic stressed structures. And he has come to recognise that the extensive family of equations and models that so accurately predict and describe expansion and contraction in solid stressed structures also apply extremely well to the observed expansion and acceleration of the universe. This new model describes all the observed properties of our universe [1] including the Hubble expansion, the acceleration and variations in the Hubble expansion. It also shows why the current measurements of the so-called Hubble constant do not, and should not, all indicate the same value [2]. As well, the new model predicts that the expansion will eventually stop, and the universe will begin a contraction. But the contraction will not continue to a so-called Big Crunch. Rather the universe will forever oscillate with simple harmonic motion.

The Stressed Universe model is based on the following dynamics of expansion and contraction of solid stressed structures. The essence of the Stressed Universe model is that everywhere in the space of our universe there exists a continuum composed of dark matter and dark energy of total uniform density ρ_{dm} which has always existed, and which is constituted in part of stressed dark matter of density ρ_p and in part of dark kinetic energy of oscillations of density ρ_k . Reference [1] demonstrates that simply because it is stressed to a compressive level P the stressed matter therefore possesses mass of density $\rho_p = P/c^2$. The values of the densities ρ_{dm} , ρ_p and ρ_k are minute, of order of magnitude 10^{-26} kg/m^3, but as they apply to the volume of the whole universe the total mass M_u due to them is therefore huge. In fact, it is much larger than the total mass of the cosmic bodies, stars, planets etc., so that it is their mass M_u which essentially constitutes our universe, the cosmic bodies representing a minute part of our universe. M_u is so large that it meets Einstein`s criteria for a universe that stops expanding. In practice, it is the stress forces and the gravitational forces which govern the behaviour of our universe, while the cosmic bodies simply ride along. ρ_p tends to keep our universe together and slows its expansion, while ρ_k tends to make it expand. It turns out that the stresses related to ρ_p , together with the gravitational forces, cause our universe to oscillate in simple harmonic motion with a period T_{SHM} =approximately6.47x10^{10} years. Reference [1] presents all the details of the calculations for the mechanical behaviour of our universe. For example, if a typical universe element δM is located at R at the instant when the oscillations are in equilibrium, and if at time t during the oscillations it is located at $R(1+ \delta)$, then the equation of motion for every element δM turns out to be $d^2 \delta / dt^2 = - K\delta$, which means the same simple harmonic motion for every element and so also for our universe as a whole. K is a constant that depends on the properties of our universe. ρ_{dm} is uniform but the spatial distribution of the stress level P varies with distance R, as it usually does in structures on Earth; the level of P is of the order of magnitude of 10^{-9} N/m^2, which is so minute that it is not measurable. Thus, our universe is really a very large stressed and oscillating structure. The Stressed Universe is a model that is totally different from the other universe models, but it predicts the known properties of our universe more accurately and more completely than any other model. There are many comments in the literature which suggests the need for a different model involving some new physics to explain how our universe works. It is desirable that the Stressed Universe be studied by the astrophysics community. The dynamics of this model are fully explained in technical and mathematical articles currently being offered for publication.

Conclusion

The new Stressed Universe model is offered to the scientific community to investigate, to verify and to be used to accurately describe the currently-observed characteristics of our expanding universe, and to then predict its long-term evolution.

References

[1] R. F. Favreau, `A stressed universe can make our universe stop expanding`, available on demand.

[2] R. F. Favreau, `The stressed universe model can explain the discrepancies in the measured values of Hubble`s H`, available on demand.

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