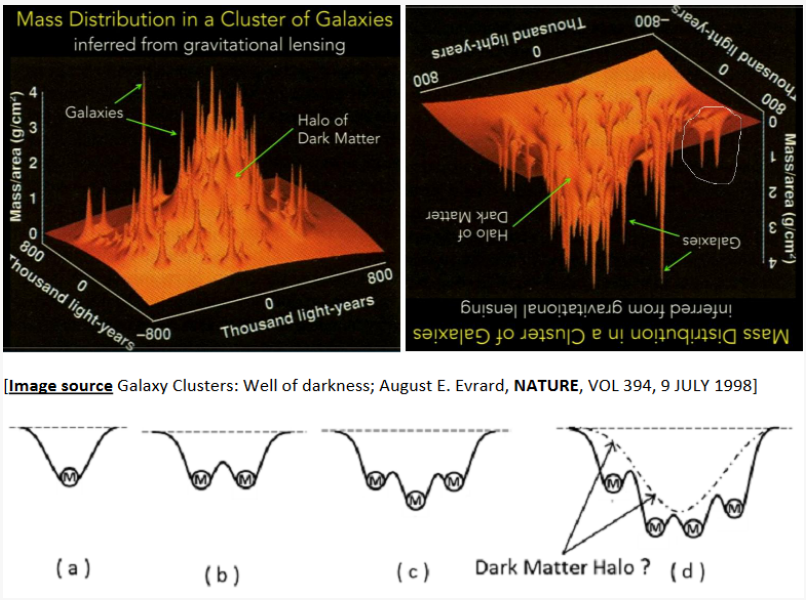
Physics and Cosmology are in crises; rescue requires revising the concept of SpaceTime

The two greatest theories of Physics are mutually conflicting because of wrong model of the universe.

INDORE, MADHYA PRADESH, INDIA, January 27, 2023 /EINPresswire.com/ -- What is SpaceTime?

SpaceTime is not a 4 dimensional continuum; mathematics is telling something else!



[**Image source** Galaxy Clusters: Well of darkness; August E. Evrard, **NATURE**, VOL 394, 9 JULY 1998]

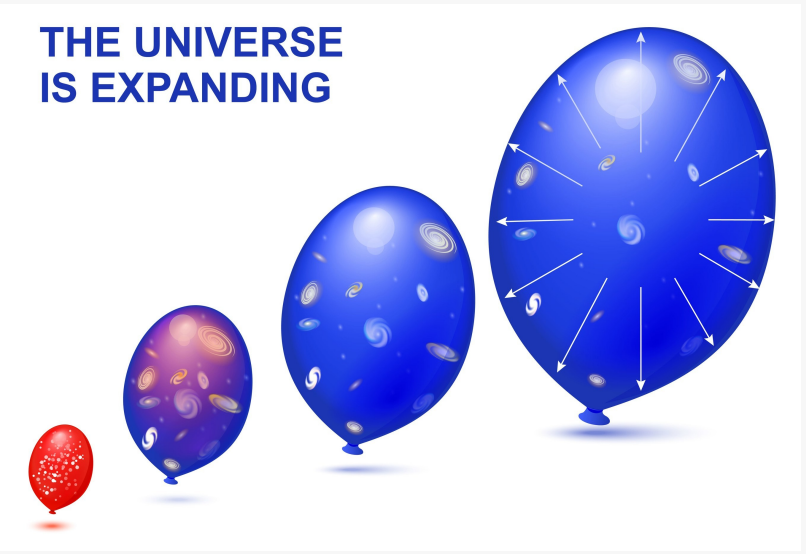
Rubber Membrane Model for Dark Matter Halo

Einstein's view of SpaceTime as a 4 dimensional continuum leads to a 'Block Universe' in which there is no distinction between the past, the present, and the future, and all three of them simultaneously exist! This contradicts with an astonishing number of observations in the whole of science, and has been challenged by Mr. Subhajit Waugh. A brief summary of the research geared towards non-specialist audiences, can be found #here . The original preprint paper is titled Quantum Mechanics and General Relativity are fully compatible, and have a common origin: the expanding (hyper) balloon universe. #Link1 #Link2

> By perceiving the universe as an expanding (hyper) balloon, concepts like wave-particle duality can be easily and coherently put together-finally building a beautiful jigsaw of nature and the universe"
>
> *Mr. Waugh*

The Minkowski SpaceTime Equation (MSTE) which explains all of special relativity (including time dilation, length contraction, and relative simultaneity) is not a statement for 4D SpaceTime continuum. That mistake occurred due to our incomplete knowledge about the true nature of imaginary numbers. An imaginary sign lies hidden within the MSTE, which distinguishes spatial dimensions from time dimension and turns the metric (+,+,+,-) instead of (+,+,+,+). Unlike real numbers, imaginary number (i) cannot be used as an independent axis. An independent axis means an additional dimension.

Imaginary number is required only for inaccessible dimension, and does not create an additional dimension. Imaginary number is required only by a trapped creature.



Our Universe is best modelled by an expanding (hyper) balloon

MSTE is confirmed to be true in countless experiments, but is actually a mathematical statement for a 3D hypersheet, moving with a velocity c in the 4th dimension in an embedding 4D hyperspace. Thus MSTE perfectly describes a small section of an expanding (hyper) balloon universe, where c is the radial increment velocity of our universe. Using this balloon model, and taking the age of our universe to be 13.8 billion years, the calculated Hubble constant value (71.002 km/s/Mpc) matches very well with accepted values (69.8 km/s/Mpc and 74 km/s/Mpc measured by two separate methods). Since the crucial SpaceTime equation and Hubble's law are both telling the same story, it should give us great confidence that we are on the right track to claim that our universe is an expanding (hyper) balloon. Since our universe is expanding at a constant rate rather than accelerating (as currently believed), we do not need dark energy, since we do not have to account for acceleration.

MSTE shows that relativity is all about being trapped inside the wall of the expanding (hyper) balloon, but being free to move along the wall. The question is "What is this 3D hypersurface wall of the balloon universe made of?"

It is made of (scalar) fields, and particles, which are mere resonances/excitations in that field. That is just the core statement of stunningly accurate Quantum Field Theory (QFT) which forms the foundation of Standard Model of Particle Physics. Thus, we get a glimpse of the unity between relativity and Quantum Mechanics.

The radius of the universe is an impossible direction for us (which does not even exist for trapped creatures like us).

The radial increase of the universe appears as passage of time for us.

The balloon shape of the universe creates two different frames of reference/viewpoints. The universe is perceived differently from each viewpoint, due to space and time exchanging roles. But it is precisely this, which allows the reconciliation between Quantum Mechanics and General Relativity, which are the two pillars of modern Physics. From the center of (balloon) universe

viewpoint, simultaneity is absolute (as demanded by Sagnac effect) and there is absolute universal time (as demanded by Quantum Mechanics). This is because, the absolute universal time elapsed since the Big Bang is simply a function of the radius of the universe. From our viewpoint (located on the surface of the balloon), our concept of SpaceTime is relative, locality is absolute, and the velocity of light is the upper limit (and remains constant for every observer irrespective of their velocity). Those were Einstein's unshakeable beliefs, which were shattered by Quantum Entanglement experiments (which led to last year's Nobel Prize in Physics). Since both relative and absolute times are possible, it solves the Time Problem, which had stubbornly resisted the reconciliation of QM and GR. Which viewpoint shall prevail is determined by size scale.

GRAVITY AND DARK MATTER: The rubber membrane/sheet model is used to teach General Relativity in schools and colleges.

Rather than taking it as an analogy, we should take it rather literally. The wall of the balloon universe behave just like a rubber membrane. The difference is that it is a 3D hypersheet rather than a 2D sheet. Massive objects like stars and planets are embedded like thin coins inside this wall itself (when viewed from the 4th dimension), and produces stretching of this wall along the 4th dimension. This stretching is seen by trapped creatures like us as warping of 4D SpaceTime fabric itself, and gives rise to gravity as General Relativity (GR) insist. This stretching also produces the same gravitational time dilation (as predicted by Einstein).

General Relativity remains the best theory of gravity. However the greatest cosmological challenges today like dark matter, black hole singularity (leading to 'information loss' paradox) etc. are mere relics of our misunderstanding of General Relativity. Since the 3D hypersheet is a single continuous sheet, and since all massive objects nearby stretch this sheet in a single direction, therefore the collective stretching gets enormously amplified (please see the image).

The resultant huge stretching bends light rays enormously (through gravitational lensing) and gives false impression of enormous amounts of Dark Matter halo. Black hole singularity is just the insider viewpoint of a trapped creature. Right at the center of the naked singularity, time passes at the same rate as in deep space, far away from any gravitational sources.

About Mr. Subhajit Waugh
Mr. Subhajit Waugh is presently working as a Scientific Officer. He obtained his Master's degree in Physics from the National Institute of Technology, Rourkela, in 2003, where he was the topper of his batch. In 1996, he was awarded the prestigious NCERT National Talent Scholarship.

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