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Short communication

On the shape and fate of our Universe

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Abstract

Einstein's special and general theories of relativity revolutionized physics and cosmology. Newton assumed four identities namely mass, energy, space, and time. He told that space is absolute. Einstein modified and refined Newtonian concepts s by postulating that mass-energy and space-time. This enabled Einstein to find special relativity theory which predicted the variance of mass with velocity, the equivalent of mass and energy, time dilation, and length contraction. The extension and generalization of special relativity theory is the outcome of general relativity theory which is the geometrical interpretation of gravity. Almost all the predictions of Einstein's general relativity theory have been experimentally verified. By delving into the equations of general relativity, the famous Russian mathematician Alexander Freedman found that the geometry of our Universe has only three possibilities, namely, open, closed, and flat. Freedman's publication in the 1920s paved the way to study the geometry and fate of our Universe. Recently, NASA's WMAP spacecraft and ESA's Planck probes and observations revealed that the geometry of our Universe is flat with a marginal error of 0.04%. But to this day, there is no mathematical proof for these observations. In this short work, by applying the multiplication and division laws of number theory to cosmic triangles the author attempts to show that the shape/geometry of our Universe is FLAT.

MSC: 51M04.

Given

Let us assume that the sum of the interior angles of cosmic triangles ADE, AFG, AHJ, and ABC are x, y, m, and m respectively. (1)

All these cosmic triangles are similar. i.e sides, AD = AE, AF = AG, AH = AJ and AB = AC (2)

So, consequently, we get that angles ADE = AED, AFG = AGF, AHJ = AJH, and ABC = ACB

Since the lateral sides are equal, the base angles are also equal. Angle BAC is common to all cosmic triangles Figure 1.

Result

Let us assume that, $xy = a$ (3)

$$yz = b \quad (4)$$

$$zm = c \quad (5)$$

$$\text{Dividing (3) by (4), } x/z = a/b \quad (6)$$

$$\text{Dividing (4) by (5), } y/m = b/c \quad (7)$$

$$\text{Dividing (6) by (7), } xm/yz = a/c \quad (8)$$

$$\text{Cross multiplying, } xmc = yza \quad (9)$$

$$\text{Applying (3) in RHS, } xmc = yz \cdot xy$$

$$\text{i.e } mc = y^2z$$

$$\text{Assuming (5) in LHS, } m \cdot zm = y^2z$$

$$\text{i.e } m = y \quad (10)$$

Comparing (10) and (1) we get that the sum of the interior angles of cosmic triangles AFG and ABC are equal.

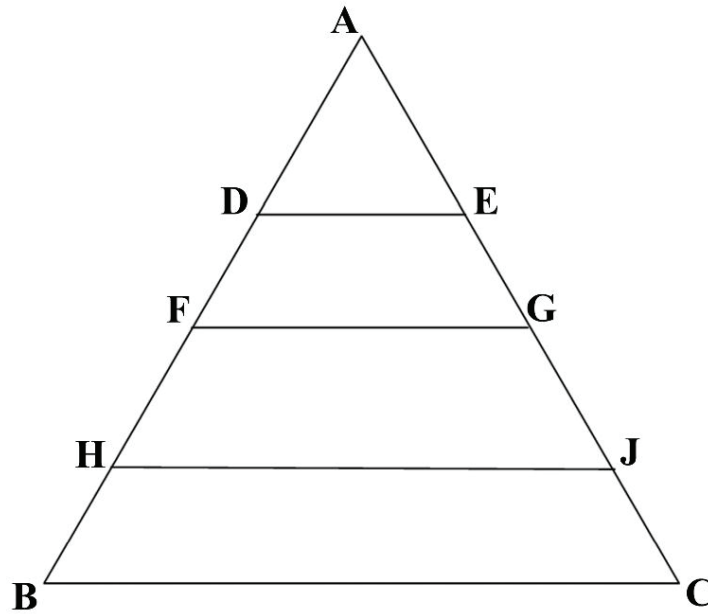


Figure 1: Cosmic Triangles.

The summit angle BAC and FAG are common to both the cosmic triangles AFG and ABC are equal.

So, since the base angles of isosceles triangles are equal, we get that the angles AFG , AGD , ABC , and ACB are equal.

This establishes that cosmic triangles AFG and ABC are similar. Consequently, we obtain that the sum of these two each cosmic triangles ABC and AFG is equal to 180° degrees.

From this, we have proved that the shape of our Universe is exactly flat.

Discussion

The geometry of the Universe reveals whether the Universe is finite or infinite. The curvature of the Universe determines the geometry of the Universe. The flat Universe has zero curvature, the positive curvature reveals that the Universe is closed or positive, and the negative curvature confirms that the shape of our Universe is open. In other words, the zero, positive and open curvatures of the universe establish that the shape of the Universe is Euclidean, elliptic, and hyperbolic respectively. This implies that the sum of the interior angles drawn in Euclidean, elliptic and hyperbolic spaces is equal to 180° degrees, more than 180° degrees, and less than 180° degrees respectively. Since we have shown that the sum of the interior angles of the cosmic triangles is equal to 180° degrees, the Universe is FLAT. The author has published eight articles on this topic [1–8]. Each work used different approaches. This result has been found by assuming the product and division rules of number theory and algebra. The author's finding is only the beginning of the game. We have to find the topology of the Universe which will show the hidden mysteries of our Universe.

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