Cosmic Background Radiation temperature

Prof. A.K.T. Assis (*Apeiron*, **12**, 10) studies the conservation of energy in a static Universe and the cosmic background radiation (CBR). He supposes that "the mean temperature of matter in the Universe is 2.7°K."

I have also looked into these topics, but I obtain a mean temperature for intergalactic matter (T_{av} of 5.4°K (see *Problems in the Study of the Universe*, **14**, Leningrad, 1990, p. 210, in Russian), as follows:

$$T_F = \frac{T_{av}}{1+z_F} = \frac{T_{av}H}{c}\int_0^\infty \exp\left(-\frac{2H}{c}r\right)dr = \frac{T_{av}}{2}$$

where T_F and z_F are the temperature and cosmological redshift of the CBR, respectively, H is Hubble's constant and c is the velocity of light.

This matter may consist of hydrogen "snowballs" with a mass density of 0.076 gr cm^{-3} and mean mass of 2000 gr. These would radiate energy in the form of transverse photons and absorb transverse (ordinary) photons and longitudinal photons (de Broglie 1943, 1949).

References

de Broglie, L. 1943, *Théorie générale des particules à spin*, Paris, p. 191.

de Broglie, L. 1949, *Mécanique ondulatoire du photon et théorie quantique des champs*, Paris, Gauthier-Villars, chap. V.

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Cosmic Background Radiation: Reply to Shlenov

Dr. Shlenov discusses our work (Assis 1992) and points out that he has obtained a mean temperature for intergalactic matter of 5.4°K instead of 2.7°K. His model is an interesting one and deserves to be further investigated.

Here we would like to mention two other important references related to this subject in which the authors correctly estimated this temperature, prior to the experimental discovery by Penzias and Wilson in 1965. Finlay-Freundlich (1954) developed an alternative interpretation of the cosmological redshift on the basis of a tired light model, and as a corollary predicted the mean temperature of intergalactic space between 1.9 and 6.0°K. Even earlier, Eddington, in a book first published in 1926, estimated the temperature of interstellar space at 3°K (Eddington 1988). And he obtained this with simple thermodynamic reasoning by equating the energy-density of the night sky with the Stefan-Boltzmann law according to which this density is proportional to the fourth power of the temperature.

References

Assis, A.K.T. 1992. "On Hubble's Law of Redshift, Olbers' Paradox and the Cosmic Background Radiation". in *Apeiron*, **12**, 10-16.

Eddington, A.S. 1988. *The Internal Constitution of the Stars*, Cambridge, Cambridge Univ. Press, Ch. 13, p. 371. Reprint of 1926 edition.

Finlay-Freundlich, E. 1954. "Red Shifts in the Spectrum of Celestial Bodies". in *Philosophical Magazine*, **45**, 303-319.

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Red-blue symmetry and action-at-a-distance

Ghosh (*Apeiron*, **12**, 1) states in the first paragraph of his first letter: "thus, when photons graze massive objects...". His logic eludes me, in that if "blueshift during approach is neutralized by the equivalent amount of redshift when the photon recedes," he describes a canceled redshift. From whence does his observed redshift originate? How can the two shifts ever come together?

As I see it, observers, when they are in front of the approaching light, can see only a blue shift from behind a receding light. A redshift, in following a blue shift, cannot cancel the blue shift because they are separated in time, as well as by the light that makes the blue and red shifts.

Joop Nieland (*Apeiron*, **12**, 2) states, "I am not boggled by action-at-a-distance...".

Newton erred with this thought, because gravity (mutual attraction) cannot be action-at-a-distance. Rather, it is an aura that surrounds all active celestial bodies, each to its correct distance in all directions, constantly. Action-at-a-distance would require intelligent celestial bodies, with fantastically versatile sensory abilities as well as magic memories, to hold constant every movement of every planet, star, comet, etc.

How else but with a gravific aura and its own motion could the sun control all the movements of all its planets and comets?

Gravity is not a "field", in Einstein's sense. There are many gravities, each based on a specific celestial body. Some gravities overlie others. The system is so organized that none interferes in any other's business, because of weightlessness in orbit. The entire scheme is created in such a manner that there is complete order and precedence of orbital control.

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Corrections

APEIRON Number 8, Page 2: Equations (3) should read:

$$x' = (x - vt)\left(1 - \frac{v^2}{c^2}\right)^{-1/2}$$
$$y' = y$$
$$z' = z$$
$$t' = \left(t - \frac{vx}{c^2}\right)\left(1 - \frac{v^2}{c^2}\right)^{-1/2}$$

Equations (5) should read:

$$X' = X\cosh B - CT\sinh B \qquad X = X'\cosh B + C'T'\sinh B$$
$$Y' = Y \qquad Y = Y'$$
$$Z' = Z \qquad Z = Z'$$
$$C'T' = CT\cosh B - X\sinh B \qquad CT = C'T'\cosh B + X'\sinh B$$

Equations (9) should read:

$$X' = X\cosh B - CT\sinh B = X - VT$$
$$C'T' = CT\cosh B - X\sinh B$$

Page 3: The text before equation 16) should read: "...moving receivers whose trajectories pass through the source *S*, *i.e.* where..."

Page 5: In Figure 4, V7 should correspond to 8.00, not 6.00.

APEIRON Number 12 Page 3: Equation (9) should read:

$$n = 1 + \frac{2Zr_e}{r}$$

The paragraph before equation (11) should read: "Comparing equations (5) and (9) leads to the conclusion that $c^2r_e/Gm_e = e^2/4\pi\varepsilon_o Gm_e^2$ represents..."

The paragraph beginning with "Then why not...": The second sentence should end "...physically with rest mass somehow."

Page 12: Equation (3) should read:

$$F = \int_0^\infty \frac{Le^{-\alpha_L r}}{4\pi r^2} n 4\pi r^2 dr = \frac{Ln}{\alpha_L}$$

The Editor

Note to authors

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