Another Explanation of the Redshifts of the Pair Quasar-Galaxy NGC 7319

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The excess of redshift of the quasar might be produced in its interior by the transference of heat from the light waves to the radio waves.

Key words: excess of redshift, transference of heat.

In 2004, it was reported [1] the discovery (contrary to the expansion of the universe) of a quasar (quasi-stellar radio source) with high redshift, $z_Q = 2.114$, in front of a galaxy, NGC 7319, with low redshift, $z_G = 0.0225$. In the enlarged photograph of the event, it can be seen that exists a "V" shaped jet of matter between the quasar and the galaxy that might confirm that the quasar was ejected by the nucleus of the galaxy.

We suppose that the redshift of the galaxy is due to that the photon loses energy by emission of heat to the intergalactic space (IGS) [2]: $z_G = z_{IGS} = 0.0225$. However, the redshift of the quasar would be: $z_Q = z_{InsideQ} + z_{IGS} = 2.0915 + 0.0225 = 2.114$.

From the principle of equipartition of the kinetic energy, we would have for a photon that [2]: $h\nu = (3/2)k_B T$, being h the Planck's constant, ν the frequency, k_B the Boltzmann's constant and T the absolute temperature (Kelvin's temperature). Therefore, between two photons of frequencies ν_1 and ν_2, and temperatures T_1 and T_2, when $\nu_1 > \nu_2$ ($T_1 > T_2$) there would be a transference of heat from the photon 1 to the photon 2: $T_f = (T_1 + T_2)/2$, and $\nu_f = (\nu_1 + \nu_2)/2$. The two photons would have the same final temperature and the same final frequency. If this thermal process is repeated n times with photons of frequency ν_2 and temperature T_2, then $T_{fn} = \left(T_1 + (2^n - 1)T_2\right)/2^n$ and $\nu_{fn} = \left(\nu_1 + (2^n - 1)\nu_2\right)/2^n$. For $\nu_1 = 1{,}025\nu_2$, $T_1 = 1{,}025T_2$ and $n = 10$; $T_{f10} = 2T_2$ and $\nu_{f10} = 2\nu_2$.

Hence, we may suppose that inside of the quasar, which is a radio source, the visible light (ν_v) transfers heat to the radio waves (ν_r), since $\nu_v > \nu_r$, then the final emitted frequency might be redshifted to a value such that $z_{InsideQ} = 2.0915$. Therefore, the excess of redshift of the quasar might be produced in its interior by the transference of heat from the light waves to the radio waves.

The transfer of heat would be exponential [2]: $T(t) = T(0)e^{-abt}$, being t the time, and a and b two constants to infer depending of the medium. In the IGS, we would have that [2] $ab = H$, where H is the Hubble's constant. Inside of the quasar, the product ab would be a very big constant.

[1] Pasquale Galianni, E. M. Burbidge, H. Arp, V. Junkkarinen, G. Burbidge and Stefano Zibetti, The Discovery of a High Redshift X-Ray Emitting QSO Very Close to the Nucleus of NGC 7319, arXiv: astro-ph/0409215v1 (2004).
http://arxiv.org/PS_cache/astro-ph/pdf/0409/0409215v1.pdf

[2] José Francisco García Juliá, Another Explanation of the Cosmological Redshift, April 6, 2010.
http://www.worldsci.org/pdf/abstracts/abstracts_4758.pdf