

The Cosmological Redshift and The Energy Conservation Law Are Consistent

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Abstract

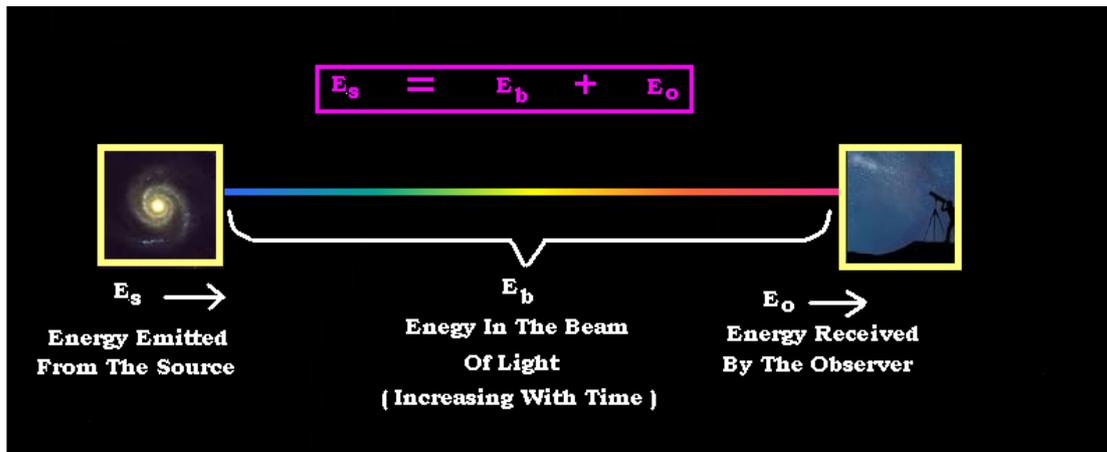
Taking into account the energy in the beam of light between the source and the observer which increases with the expansion of the universe one can easily and conclusively prove that the total energy is conserved.

The Apparent Contradiction

Because of the expansion of the universe , the light we receive from distant galaxies gets red-shifted and consequently less energetic and thus the emitted power is less than the received power which seem to violate the principle of the conservation of energy.

Where Does This Difference of Energy Go? Is It Lost?

No it is not lost of course .. It is used to fill the gap between the source and the receiver ! The energy in the beam of light is proportional to the distance between the source and the observer which increases with the expansion of the universe . In any process of emitting and receiving if the distance between the source and the receiver is increasing then there must be a difference between the rate of emitting and the rate of receiving because the quantity of the thing which is emitted increases in the gap between them . So if the source stop emitting light the observer will not stop receiving it until all the energy between them reaches the observer , then the total emitted energy is equal to the total observed energy.



Unfortunately, this important increasing amount of energy between the source and the observer is not taken into account by physicists. This led to skeptic statements by number of authors like Tamara M Davis who claim that " .. the universe does not violate the conservation of energy ; rather it lies outside that law's jurisdiction ". [see: Scientific American . July 2010]