Olbers Paradox in a Static and Infinite Universe

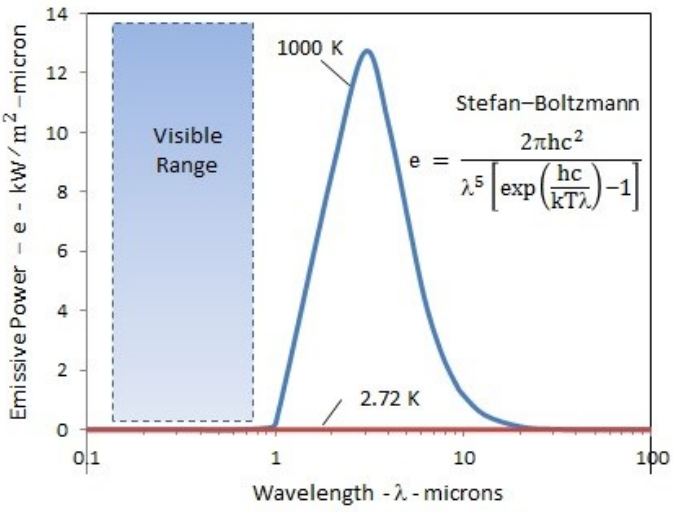
Thomas Prevenslik, QED Radiations, Berlin, Germany

Abstract

Statement of the Problem: In 1823, Olbers made the paradoxical observation that the night sky is dark, but in a static infinite Universe the night sky should be bright. Indeed, Olbers paradox is often argued in supporting the Big Bang theory in an expanding finite Universe. Olbers argued in an infinite Universe the observer would see a nearby galaxy in one region of the sky and other more distant galaxies. Although the nearby galaxy would appear brighter, there would be more distant galaxies in the sky. Therefore, both the light from the nearby region and the total light from the distant region would be the same. Hence, the night sky should be bright if the Universe is infinite, but since the night sky is dark, Olbers concluded the Universe is finite and expanding.

Analysis: In a finite Universe, visible stars are continuously heating the extragalactic CMB, but the thermally stable CMB remains at 2.72 K. CMB stands for cosmic microwave background. Hence, Olbers paradox requires the Big Bang to expand the finite Universe, the increased volume compensating for starlight heating to maintain a uniform CMB at 2.72 K. But in a static infinite Universe, the CMB temperature should continually increase which is not observed. Olbers therefore concluded the Universe is finite and expanding consistent with the Big Bang. However, the figure shows black body radiation from the CMB lacks a visible content over wavelengths $\lambda < 1$ micron including the infrared $\lambda > 1$ micron. Even if the CMB were 1000 K, say in the early Universe, the night sky would still appear dark and not visible.

Conclusion & Significance: Olbers paradox is resolved. Either static and infinite or finite and expanding Universes are possible, but the Universe is more likely static and infinite because the finite and expanding Universe requires the speculative Big Bang to maintain the CMB temperature at precisely 2.72 K.



Recent Publications

Wesson, P. S. Olbers paradox and the spectral intensity of the extragalactic background light. APJ, 367:399-406,1991.

Prevenslik, T. Olbers Paradox , 2019

Prevenslik, T. A Return Of Cosmology to Newtonian Mechanics?, 2019

F. Hoyle, G. Burbidge, and J. Narlikar A Different Approach to Cosmology: From a Static Universe through the Big Bang towards Reality, Cambridge Press, 2005.

Prevenslik, T. Cosmology and Cosmic Dust , 2017–18

Biography

Thomas Prevenslik developed the simple theory of QED based on the Planck law of quantum mechanics. Differing from the complex QED by Feynman and others, simple QED assumes any heat absorbed in nanoparticles having high surface-to-volume ratios place interior atoms under high EM confinement that precludes the atoms from having the heat capacity to conserve heat by an increase in temperature. In the instant topic of cosmology, the nanoparticles take the form of submicron cosmic dust that permeates the Universe. Galaxy light redshift from the recession velocity of a galaxy and absorbed by cosmic dust on the way to the Earth undergoes an additional redshift. If the redshift is not corrected for cosmic dust, galaxy velocities are significantly overstated giving the impression that dark matter exists to hold galaxy clusters together when in fact dark matter does not exist and the galaxies are simply held together by Newtonian mechanics

Email: thomas@nanoged.org

Mobile Phone: +49-172-325-7678

Comments: