**Big Bang Theory**

**Name**

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**Olbers' Paradox**

The fact that the Universe has a finite age provides a new approach to a relatively old problem, first raised by Kepler and picked up in more precise terms by Heinrich Olbers in 1826. This problem is known by the name of the paradox of Olbers, and it is enunciated thus: why the sky is black at night.

Olbers proposed the following explanation to the paradox in 1826: the night sky was black because the interstellar matter absorbed the radiation of the stars and weakened, then, it's light. However, as stipulated by thermodynamics, energy must always be conserved. Thus, the radiation absorbed by the interstellar medium had to be emitted again in one form or another, and Olbers' explanation was not sustained. Another explanation was to say that the stars were not evenly distributed, as they regrouped into galaxies. But this solution was not satisfactory either, because the reasoning that led to the paradox could very well apply to the galaxies themselves (Brent, 2018).

It is, in reality, in the finite age of the Universe, it is necessary to seek the solution to Olbers' paradox. Indeed, since the Universe is only about 13.7 billion years old, light, whose speed is finite, could not travel much from its origin, but a finite distance, and it is impossible for us to observe objects more distant than this maximum value (Howell, 2017).

The explanation of the paradox then becomes very simple: galaxies that are beyond this maximum limit are inaccessible to us and do not contribute to the brightness of the sky. There remain the directions of the celestial vault in which our gaze finds absolutely nothing. Olbers' reasoning no longer holds, and the paradox rises: the sky is black at night because there are a large number of empty spaces in the distribution of the observable galaxies. That means that the further away a galaxy is, the weaker is its contribution to the brightness of the sky (Cain, 2017).

**Example of observation evidence that supports the Big Bang Theory**

The scientific evidence related to big bang theory leaves little room for doubt. There are numerous key points in the understanding of the universe. These points help us to get a remote idea of ​​what happened at the beginning of time. And that also helps us to imagine what will happen to the universe. The foremost one is demonstrated by Edwin Hubble back in the 20s, this astronomer, one of the most important in our history, spent his scientific life studying nebulae. Among his research, he discovered that there is something beyond our galaxy. And he also managed to explain that the great celestial objects were moving and how they were doing it: moving away from the same point. In particular, all extragalactic nebulae move away and the farther they are, the faster they do it.

In the end, his observations translate into the fact that the universe is expanding, which may make us think that at some point in time, it was concentrating on a point. To arrive at the conclusion, Edwin Hubble described the speed of each object by measuring it according to its "redshift". This process occurs when a light source increases in its wavelength, (so it is seen, when it is visible, in "red tones"), which happens precisely because it is moving away from our point of view (Dashper, Denny & Shannon, 1993).

To understand, this great evidence makes us think that at one point the universe was a small energy ball filled with a soup of particles. Although it is very difficult to describe, one must understand that at that time there was no time or space. This singularity suddenly, "exploded" and expanded in a magnitude that one simply cannot even imagine. So, this is how the universe, space and time came into being.

## References

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