

A new calculation to obtain the radius of the habitable zone around the stars of the Universe

Gh. Saleh

Saleh Research Centre, Netherlands

Considering the habitable zone of our own solar system, which is the zone that can have a planet with the possibility of intelligent life with different characteristics, it is possible to calculate the habitable zone for other stars. The distance from the center of this zone in the solar system can be considered as the distance from the sun to the earth, and the width of the zone can be considered to be about 10% of the distance.

To get the distance of the center of the habitable zone near other stars, it is enough to establish the following ratio and calculate the distance to the specific star:

$$\left. \begin{array}{l} \text{sun} \Rightarrow r \equiv I \\ \\ \\ \\ \text{Star} \Rightarrow R \equiv I_S \end{array} \right\} \Rightarrow \frac{r}{R} = \frac{I}{I_S} \Rightarrow R = \frac{r}{I} I_S \Rightarrow R = K \cdot I_S$$

$$K = \text{constant} = \frac{r}{I} = \frac{1.5 \times 10^{11} m}{1361 \text{ W/m}^2} \Rightarrow K = 1.1 \times 10^8 \text{ m}^3/\text{W}$$

where “r” is the distance from the center of the habitable zone of the our solar system to the sun (the average distance of the earth from the sun), “R” is the distance from the center of the habitable zone to a certain star, “I” is the intensity of sun on the earth and “I_S” is the intensity of the certain star at a distance “R” from it.

