

Interplanetary Medium

The interplanetary spaces are not empty, even if they are very close to an absolute vacuum. The vacuums created on Earth so far are many times denser than the interplanetary medium.

The interplanetary medium consists of different parts:

- Interplanetary dust,
- the hot plasma of the solar wind and
- Particles of cosmic rays.

The temperature and density of the interplanetary medium decreases with distance from the Sun. Dust in the asteroid belt has temperatures of about 200 K (-73 °C) at a solar distance of 2.2 AU (1 astronomical unit = 150 mill km); at 3.2 AU the temperature is 165 K (-108 °C).



Picture: A meteoroid shown entering the atmosphere, causing a visible meteor and hitting the Earth's surface as a meteorite

Author: SO/C. Malin

[https://upload.wikimedia.org/wikipedia/commons/9/95/Cosmic Fireball Falling Over ALMA
A.jpg](https://upload.wikimedia.org/wikipedia/commons/9/95/Cosmic_Fireball_Falling_Over_ALMA.jpg)

The interplanetary dust consists of a large number of tiny objects, ranging in size from a few micrometers (thousandths of a millimeter) to a few millimeters. Every year, Earth is hit by thousands of these smallest celestial bodies. The hits of the larger objects can be perceived by us as shooting stars. In August, the hit rate is particularly high, since the earth then crosses a particle stream, the Leonids. So it is worth to watch the sky during this time to make a wish. Despite their smallness, the sum of these hits is in the range of several thousand tons per year, which is due to their large number. These objects are made of rocks, ice or frozen gas molecules.

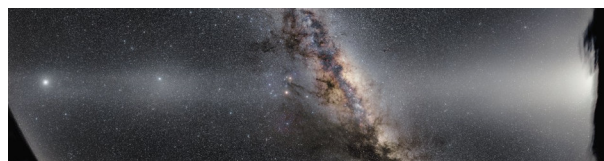


Picture: Images of auroras from around the world, including those with rarer red and blue lights

Author: AstroAnthony

https://en.wikipedia.org/wiki/Aurora#/media/File:Church_of_light.jpg

Another part of the interplanetary medium is the solar wind, which consists of ions (ionized atoms), protons, electrons and neutrinos. Near Earth, the solar wind consists of about 5 particles/cm³. The source of the solar wind is mass ejections from the Sun. The solar wind is responsible for the formation of the auroras on Earth. The auroras are formed when particles of the solar wind hit the Earth's atmosphere. The solar wind is also the carrier of the solar magnetic field. The space filled by the solar wind is the heliosphere. The boundary of the heliosphere is called the heliopause and marks the boundary with interstellar space. The Voyager probes 1 and 2 passed the heliopause in 2012 and 2018 at a distance of about 120 AU from the Sun.



Picture: The interplanetary dust cloud illuminated and visible as zodiacal light, with its parts the false dawn,[1] gegenschein and the rest of its band, which is visually crossed by the Milky Way.

Author: ESO/P. Horálek

https://en.wikipedia.org/wiki/Interplanetary_dust_cloud#/media/File:False_Dawn.jpg

The zodiacal cloud is a cloud of dust and gas surrounding the Sun in the planetary plane. It can be perceived as zodiacal light on clear nights. The so called Gegenschein of the sun (near the opposite point of the sun) is also caused by this cloud.

Also the electromagnetic radiation coming from the sun (radio, infrared and X-rays as well as visible and ultraviolet light) is part of the interplanetary medium.

The interplanetary medium is also enriched by cosmic rays and particles coming from the Galaxy and passing through our solar system.

Link: https://en.wikipedia.org/wiki/Interplanetary_medium

Link: https://en.wikipedia.org/wiki/Interplanetary_dust_cloud

Link: https://en.wikipedia.org/wiki/Interplanetary_magnetic_field