



Cosmic Radiation

Radiation from space is constantly hitting the Earth. Radiation from space is called cosmic radiation.

- Cosmic radiation makes up about five percent of annual radiation exposure of an average person in the United States.
- When we are closer to outer space, we receive more cosmic radiation.

About Cosmic Radiation

Radiation from space is constantly hitting the Earth. Radiation from space is called cosmic radiation. About five percent of the average annual radiation exposure for people in the United States comes from outer space. Earth's atmosphere also shields us from most of the cosmic radiation that comes our way. The more air that is between outer space and us, the more shielding we have.

The closer we get to outer space, the more we are exposed to cosmic radiation. As a result, part of our exposure to cosmic radiation depends on the elevation where we live. For example, Denver, Colorado is more than 5,000 feet above sea level and Miami, Florida is only about 40 feet above sea level. This means that people living in Denver are exposed to more cosmic radiation than people living in Miami, since people in Denver are closer to outer space.

The space station and space vehicles, which are completely outside Earth's atmosphere, have no natural protection from cosmic radiation. Special shielding is added to the space station and space capsules to protect astronauts from dangerous levels of cosmic radiation.

Another factor in our exposure to cosmic radiation is the number and length of airline flights we take. When we fly in an airplane, we are closer to outer space. With less atmosphere to protect us, we are exposed to more cosmic radiation than when we are standing on the ground. The amount of cosmic radiation we receive during flights depends on many things. Two of the most important factors are altitude and length of the flight. If we take a one-way flight across the country (New York to Los Angeles), we are likely to receive two to five millirem (mrem) of radiation. The radiation from two cross-country flights is about equal to the radiation dose from a single chest x-ray.

In the United States, the average dose of radiation people receive is 620 mrem per year. For people who do not fly frequently, the extra exposure adds little to their total dose. However, airline crew members need to consider their flying time more carefully. The Federal Aviation Administration (FAA) has calculators for crew members to estimate and track their exposure.

Rules and Guidance

FEDERAL AVIATION ADMINISTRATION (FAA)

Solar events like solar flares or coronal mass ejections can raise radiation levels at high altitudes and/or latitudes (distance from the equator). The FAA sends out a Solar Radiation Alert so pilots can fly at lower elevations to reduce exposure. The FAA also developed a computer software programs that estimate radiation exposure from flights.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)

NOAA uses Geostationary Operational Environmental Satellites (GOES) to continuously monitor both Earth and space weather, including cosmic radiation. FAA uses this data to determine if there is a need for a Solar Radiation Alert and works with NOAA to send out an alert to pilots, if needed.

What you can do

Cosmic radiation is part of the natural radiation that we are exposed to all the time. Cosmic radiation makes up only a small portion of the radiation that we are exposed to every year.

Where to learn more

You can learn more about cosmic radiation by visiting the resources available on the following webpage:
<http://www3.epa.gov/radtown/cosmic-radiation.html#learn-more>.