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SURVIVING MARS: CHALLENGES OF A SUSTAINABLE OUTPOST

Abstract

The discussion about people living on Mars faces many difficulties in setting up a kind of home away from Earth. Mars has some Earth-like features, such as ice caps and water underground, but it's not easy for humans to live there. The planet has extreme cold, radiation, and a dangerous terrain that make it hard for people to stay there for a long time.

To deal with these challenges, we need a comprehensive plan. The main issue is not having enough energy because Mars is far from the sun, making solar power only 40% as effective as on Earth. Other energy sources like wind and geothermal power won't work well, so we have to rely on nuclear technology. But there's a problem because Mars doesn't have the radioactive elements needed for nuclear power, so we have to bring them from Earth.

Apart from energy, keeping people alive is crucial. Mars has a very thin atmosphere made mostly of carbon dioxide, so we have to pressurize habitats and create an artificial atmosphere with nitrogen and oxygen. We also need special designs for structures to withstand the pressure, airtight doors, and few windows due to radiation.

The harsh Martian conditions also affect health, with high levels of radiation being a big danger. Solutions like using frozen carbon dioxide to shield habitats aim to reduce these risks and ensure people can live on Mars for a long time. There are also challenges like Mars dust, toxic soil, and the need to clean everything, making the plan more complicated.

Growing food on Mars is tough because the soil is not good for plants. We need to clean and fertilize the soil, but it takes a lot of energy. One idea is to use aquaponics, which combines fish and plants to provide a variety of food and improve the mental well-being of the people living there.

In conclusion, creating a home on Mars requires using advanced technology, careful planning, and making changes to our bodies. If we can overcome these challenges, it opens the door to more people living on different planets, showing humanity's ongoing desire to explore beyond Earth.