

# **Script**

## **In the News: Living and Working on the Moon**

Hello this is Nan Munsey recording from the NSTA conference in Anaheim, CA.

We have been researching the safety issues for astronauts who will be living and working on the moon.

The questions we have discussed are:

What are the causes of Space Weather?

What are the dangers of emissions from the Sun?

What is the prediction for the next solar cycle?

What are the proposed materials that will prevent dangerous health issues for astronauts on the moon?

First, let's take a look at the causes of Space weather?

A coronal mass ejection (CME) can accelerate protons, a billion ton cloud of electrified gases at nearly the speed of light toward the Earth Moon system. These large eruptions pack more than 100 million electron volts.

A Solar Flare is a sudden release of magnetic energy, like a rubber band, that can suddenly snap to a new shape. They can release as much energy as one 10 billion megaton nuclear bomb!

The Sun's magnetic field spirals like a water sprinkler. Protons are guided by magnetic force fields creating a super highway for protons that travel from sunspots to the Earth.

Just as we need a warning system in place for our weather on Earth, we need a first warning alert system for Space Weather. We use space craft to predict space weather and provide the first warning alert.

SOHO, TRACE, ACE WIND, and RHESSI provide the needed data that help us to make space weather predictions.

Now let's take a look at our second question: What are the dangers of emissions from the Sun?

A CAT scan is equal to 1 rem of radiation; no danger to an average person on Earth. However, on the surface of the moon, in today's space suit, 50 rem is absorbed that would cause radiation sickness.

Furthermore, a sudden solar storm would cause 300 rem which would be deadly.

Our third question is, "What will the next solar cycle look like?"

Our next solar cycle is predicted to begin in late 2007 or early 2008 and is predicted to be 30-50 % stronger. This prediction is based on recorded history. Our Sun has a magnetic memory.

Our final question is, "What are the recommendations for protecting our astronauts as they live and work in space?"

We first need to figure out how much radiation our bodies can handle and what type of space craft needs to be designed.

Presently we use aluminum which is adequate for today's exploration. However, we need to find alternative materials that will protect astronauts more effectively.

Plastics are rich in hydrogen; an element that does a good job of absorbing solar radiation. It is 10 times stronger than the presently used aluminum and lighter too.

Liquid Hydrogen is 2.5 times better at blocking cosmic rays than aluminum.

Electric shields could be created to repel radiation.

As you can see, there are many scientific and engineering problems yet to be solved.

This was a research report developed to inform you of the problems needed to be solved as NASA prepares to send astronauts to Moon, Mars and Beyond.

This is Nan Munsey from the NSTA conference in Anaheim CA signing off.

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