

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Radiation Hazard from Galactic Cosmic Rays** ASHRAF FARAHAT,  
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Space radiation is a major hazard to astronauts in long-duration human space ex-  
ploration. Astronauts are exposed to an enormous amount of radiation during their  
missions away from the Earth in outer space. Deep space is a rich environment of  
protons, gamma rays and cosmic rays. A healthy 40 years old man staying on Earth  
away from large doses of radiation stands a 20% chance of dying from cancer. If the  
same person travels into a 3- year Mars mission, the added risk should increase by  
19%. This indicates that there is 39% chance of having cancer after he comes back  
to Earth. Female astronaut chances to get cancer is even almost double the above  
percentage. The greatest threat to astronauts en route to the red planet is galactic  
cosmic rays (GCR). GCRs penetrate through the skin of spaceships and people like  
tiny firearm bullets, breaking the strands of DNA molecules, damaging genes, and  
killing cells. Understanding the nature of the GCRs, their effect on biological cells,  
and their interactions with different shielding materials is the key point to shield  
against them in long space missions. In this paper we will present a model to eval-  
uate the biological effects of GCRs and suggestion different ways to shield against  
them.

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Date submitted: 30 Nov 2005

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