

Cosmic Rays Physics and the Space Radiation Challenge

**A.F. Barghouty, PhD
Space Science Office
NASA Marshall Space Flight Center
Huntsville, Alabama**

Space radiation is rapidly being recognized as one of the major challenges facing timely and successful implementation of the new space exploration vision that has been guiding NASA's science and technology since early 2004. This is particularly so for deep-space extended missions like an excursion to Mars or the establishment of a lunar post. Meeting the space radiation challenge draws on both basic and applied space science in addition to materials science and engineering, basic biology and radiobiology, etc. This talk will concentrate on the contributions of cosmic rays physics to our basic understanding of the problem as well as our ability to mitigate and design solutions against space radiation hazards. Emphasis will be on galactic cosmic rays (and solar energetic particles to a lesser degree), highlighting their characteristics, transport, and interactions in various media, as they relate to space radiation and space radiation hazards. In addition to this expose, this talk will also attempt to point to areas where our basic knowledge vis-à-vis space radiation seems to be lacking and where it is not.