

## **The ALTEA project**

*Influence of cosmic radiation on the visual system and on the other sensory systems, and study of the space radiation environment for human exploration*

Prof. Livio Narici  
Department of Physics – University of Rome Tor Vergata  
&  
INFN – Roma2

### **Abstract**

The ALTEA project idea started at the end of the 1990's and was initially devoted to the study of the "Light Flashes" phenomenon reported by astronauts who perceived, in absence of light, flashes of light of different forms when in orbit or traveling to the moon. This effect was soon referred to passages of charged particles through the visual system (most likely the retina). The ALTEA project includes measurement in space (cosmic radiation impinging in the astronauts' brain with concurrent electrophysiological monitoring) and on ground (on hadron-therapy patients, with in vitro and in vivo measurements on animal models). Using data and information from proton therapies the ALTEA project recently expanded its interests on the influence of radiation on other sensory systems (auditory, olfactory and gustative).

The project is also aimed at a detailed study of the radiation environment inside the International Space Station (ISS) to build a dataset to be used for the validation of exploration driven – models for cosmic radiation.

A brief history of the light flashes studies will be presented, with the major results achieved in the ALTEA project including a possible interaction model for the origin of these anomalous perceptions. A panorama of what is becoming evident about other sensory systems involvement will also be mentioned. Finally, results from the ISS radiation environment studies will be presented.