Space radiation biology and astronauts' risk: where are we now

Specific Seminar – Curriculum 4

2025, May 28, 4:00 p.m.

Speaker:

Prof. Giorgio Baiocco, Department of Physics and Radiation Biophysics and Radiobiology Laboratory - University of Pavia

Abstract:

Several pending issues need to be solved to adventure into longer-duration human space missions. Among these, health risks related to astronaut's exposure to the unique and time-varying space radiation environment have always been considered a potential show-stopper. Huge collaborative scientific efforts are needed to fully understand the molecular mechanisms underlying biological effects of ionizing radiation, and how these depend on the peculiar characteristics of space radiation as mixed particle types, low dose and low dose rate, prolonged nature of the exposure, as well as on the presence of other co-stressors as microgravity. To further enable human space exploration, a thorough assessment of radiation risk, reducing the associated uncertainties and, when feasible, developing effective countermeasures, must be a research priority. Current knowledge on space radiation effects, gaps to be filled and possible strategies on how to address key questions, as well as their related Earth-based applications, will be presented and discussed.

Short Bio:

Giorgio Baiocco is Associate Professor in Applied Physics and Head of the Radiation Biophysics and Radiobiology Laboratory, at the University of Pavia, Italy. After the PhD in fundamental nuclear physics, since 2013 his research activity has been mainly focused on the effects of ionizing radiation on biological structures, with the development of theoretical models and simulations as well as the design and data analysis of radiobiological measurements. Applications of this research go from radiation therapy to diagnostics, from radiation protection to risk, especially for the effects of low doses and for space radiation. In the field of space radiation biology, he has coordinated and participated to projects funded by the Italian and European Space agencies. He's currently vice-chair of COSPAR (Committee on Space Research) Commission F: Life Sciences as related to Space, and among the scientific organizers for meeting of Sub-commission F2.2.: Space Radiation Risk and Countermeasures: Physical and Biophysical Mechanisms, Modelling and Simulations.

Online attendance:

https://unipv-it.zoom.us/j/98299947209

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