

Canadian Space Agency Discipline Working Group for Space Dosimetry and Radiation Science

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Abstract

One of the great technical challenges in the human and robotic exploration of space is the deleterious effect of radiation on humans and physical systems. The magnitude of this challenge is broadly understood in terms of the sources of radiation, however, a great deal remains to be done in the development of instrumentation, suitable for the space environment, which can provide real-time monitoring of the complex radiation fields encountered in space and a quantitative measure of potential biological risk.

In order to meet these research requirements collaboration is needed between experimental nuclear instrumentation scientists, theoretical scientists working on numerical modeling techniques and radiation biologists. Under the auspices of the Canadian Space Agency such a collaborative body has been established as one of a number of Discipline Working Groups. Members of the Space Dosimetry and Radiation Science working group form a collaborative network across Canada including universities, government laboratories and the industrial sector.

Three central activities form the core of the Space Dosimetry and Radiation Science DWG. An instrument sub-group is engaged in the development of instruments capable of gamma ray, energetic charged particle and neutron dosimetry including the ability to provide dosimetric information in real-time. A second sub-group is focused on computer modeling of space radiation fields in order to assess the performance of conceptual designs of detectors and dosimeters or the impact of radiation on cellular and sub-cellular biological targets and a third sub-group is engaged in the study of the biological effects of space radiation and the potential of biomarkers as a method of assessing radiation impact on humans. Many working group members are active in more than one sub-group facilitating communication throughout the whole network.

A summary progress-report will be given of the activities of the Discipline Working Group and the R&D objectives for the second year of the program.

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