



## **SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE**

**SUJET: Heavy Ions in Therapy and Space**

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**LIEU: Science III, Auditoire 1S081**  
Boulevard d'Yvoy, 1211 Genève 4

### **RÉSUMÉ:**

Research in the field of biological effects of energetic charged particles is rapidly increasing. It is needed for both radiotherapy and protection from the exposure to galactic cosmic radiation in long-term manned space missions. Although the exposure conditions are different in therapy and space (e.g. low- vs. high-dose rate; total- vs. partial-body exposure), a substantial overlap exists in several research topics, such as: individual radiosensitivity, mixed radiation fields, normal tissue degenerative effects, biomarkers of risk, radioprotectors, non-targeted effects. Late effects of heavy ions are arguably the main health risk for human space exploration, and with the increasing number of cancer patients (including young adults and children) treated by protons and carbon ions, this issue is now becoming extremely important in particle therapy as well.

Reducing uncertainty in both cancer and non-cancer late risk estimates is therefore the first priority in heavy-ion radiobiology: it is necessary for a safe use of ion therapy in radiation oncology and for planning exploratory missions, especially the Mars exploration. In addition, researchers involved either in experimental studies on space radiation protection or particle therapy often use the same high-energy accelerator facilities. Several particle therapy facilities are now operating, under construction or planned in Europe, USA, and Asia. It is foreseeable that the availability of beamtime and the presence of many dedicated research programs will lead to great improvements in our knowledge of biological effects of heavy ions in the coming few years.

INFORMATION : <http://dpnc.unige.ch/seminaire/annonce.html>

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