

Knowledge Dissemination Plan

Capacitation: Studies for the development of particle detectors of the space radiation environment

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Host researcher: Dr. Mark Christl, NASA Marshall Space Flight Center, USA

Proposed area: Space Science and Engineering / Space and Fundamental Sciences

September 8, 2019

The knowledge acquired during the capacitation stay will be disseminated among professors and students from different ITA postgraduate programs (PG/CTE, PG/FIS) by:

- 1) ITA post graduation courses that I collaborate with: I will give classes in the PG/CTE program with the purpose to share the acquired expertise and contribute to the following courses:
 - a) Experimental techniques of detection and dosimetry for ionizing radiation (TE-236);
 - b) Dosimetry and Radioprotection applied to aerospace sciences (TE-231).
- 2) Collaboration with researchers and students from different projects I take part in:
 - a) The Cosmic Radiation Effects on Aircrew (ERICA) Project: it consists in developing measurements of the cosmic radiation at flight altitudes and quantifying the genotoxic effects of this radiation field. Part of this project consists in performing simulations using the *gPartAt* platform developed by our research group. A better understanding of the characterization of the space radiation field at Low Earth Orbit

(provided in the activity plan) can improve the model used to generate the primary cosmic radiation at the top of the atmosphere.

- b) The Ionizing Radiation Effects on Aerospace Systems, Aircrew and Defense (ERISA-D) Project: this project is supported by the Brazilian Air Force and develops studies about the impacts of ionizing radiation in electronics, aircrew and defence. The methodology of modeling and development of portable particle detectors of the cosmic radiation field acquired during the capacitation stay will be used to develop a portable neutron spectrometer for cosmic radiation field.
 - c) The Scintillation Prediction Observation Research Task (SPORT) Project (FAPESP: 2016/24970-7): The SPORT Project is a partnership between ITA, INPE and NASA. I am part of this project with the objective of supporting the scientific part. The study of cosmic radiation detection and the understanding of this type of radiation field in the space environment will contribute to studies and simulations of cosmic radiation transport in the atmosphere, as well as to the development of studies about cosmic radiation correlations and the trigger of ionospheric bubbles.
- 3) Seminar to the Physics Department: the Physics Department of ITA has a regular weekly seminar destined to professors and students. I will give a seminar about the knowledge acquired during the capacitation stay.