

**Contracts Final Presentation 19-20 Feb. 2004**

**1. Title of the presentation**

Mars Radiation Environment and Its Effects on Components, inputs for an integrated software tool.

**2. Speaker**

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**3. Abstract**

Space radiation environment is a source of hazard and may lead to malfunction and even failure of spacecraft system, sub-system or components. In particular semiconductor materials are sensitive to and affected by high-energy particles.

The increasing number of planned or already flying European and other missions to Mars, Mercury, Jupiter, Saturn (Mars Express, BepiColombo, Cassini/Huygens) add to the need for knowledge of the planetary radiation environments. General planetary radiation environment has some commonalities with Earth. However each planet also has its own unique features. The important drivers for proper feature modelling are: distance from the Sun, presence of a magnetosphere and/or atmosphere, moons, local geology and topology.

For planetary missions, the radiation environment is due to two main sources of radiation, namely the: cosmic rays and solar flares.

Semiconductor materials are particularly sensitive to damage caused by high-energy charged and neutral particles. This generally arises due to both the displacement of atoms from crystal lattice sites and to local ionisation, together with an ionisation track caused by penetrating radiation.

In this work the preliminary studies on Mars Radiation environment and radiation effects on components is briefly presented and is a precursor for a planned ESA project with LIP (Portugal).