



## **The Need For Space Weather Studies at the Moon and Mars**

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The future human exploration of the Moon and Mars can only take place if the environment they will encounter is well characterised, and the risks understood and quantified. A particularly important component in this is the Space Weather environment. This has implications not only directly for the health and safety of humans on the surface, but also for the reliability of the equipment they will use, the experiments they will carry out, and the communications they will rely on. We will consider the differing hazards at the Moon and Mars. For the Moon monitoring may be best carried out in conjunction with Earth, using a fleet of nanosats. For Mars we have proposed a minimum package to accurately diagnose the conditions at the surface of Mars as part of the Pasteur rover. The aim is to provide the ground truth needed to produce a good model of the space weather conditions in order to allow optimised engineering planning of future missions and comms systems by assessing performance within the expected space environment variations. The payloads will rely on a high degree of miniaturisation, low power technologies, and a highly efficient use of data storage and telemetry bandwidth.