

## Planetary Space Weather Services for the Europlanet 2020 Research Infrastructure

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### Abstract

Under Horizon 2020, the Europlanet 2020 Research Infrastructure (EPN2020-RI) will include an entirely new Virtual Access Service, **WP5 VA1 “Planetary Space Weather Services”** (PSWS) that will extend the concepts of space weather and space situational awareness to other planets in our Solar System and in particular to spacecraft that voyage through it. VA1 will make five entirely new ‘toolkits’ accessible to the research community and to industrial partners planning for space missions: a general planetary space weather toolkit, as well as three toolkits dedicated to the following key planetary environments: *Mars* (in support ExoMars), *comets* (building on the expected success of the ESA Rosetta mission), and *outer planets* (in preparation for the ESA JUICE mission to be launched in 2022). This will give the European planetary science community new methods, interfaces, functionalities and/or plug-ins dedicated to planetary space weather in the tools and models available within the partner institutes. It will also create a novel *event-diary* toolkit aiming at predicting and detecting planetary events like meteor showers and impacts. A variety of tools (in the form of web applications, standalone software, or numerical models in various degrees of implementation) are available for tracing propagation of planetary and/or solar events through the Solar System and modelling the response of the planetary environment (surfaces, atmospheres, ionospheres, and magnetospheres) to those events. But these tools were not originally designed for planetary event prediction and space weather applications. So **WP10 JRA4 “Planetary Space Weather Services”** (PSWS) will provide the additional research and tailoring required to apply them for these purposes. The overall objectives of this JRA will be to review, test, improve and adapt methods and tools available within the partner institutes in order to make

prototype planetary event and space weather services operational in Europe at the end of the programme.