



## **Particle Environment Package (PEP) for the ESA JUICE mission**

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Particle Environment Package (PEP) is a suite of particle sensors proposed for the ESA JUICE mission. PEP includes sensors for the comprehensive measurements of electrons, ions, energetic neutrals, and neutral gas. PEP covers over nine decades of energy <math><0.001\text{ eV}</math> to >1 MeV with full angular coverage. Combining remote global imaging via energetic neutral atoms (ENAs) with in-situ measurements, PEP addresses all scientific objectives of the JUICE mission relevant to particle measurements. PEP will seek answers for four overarching science questions: How does the corotating magnetosphere of Jupiter interact with complex and diverse environment of Ganymede? How does the rapidly rotating magnetosphere of Jupiter interact with seemingly inert Callisto? What are the governing mechanisms and their global impact of release of material into the Jupiter magnetosphere from Europa and Io? How do internal and solar wind drivers cause such energetic, time variable and multi-scale phenomena in the steadily rotating giant magnetosphere of Jupiter? We discuss the suite's sensor basic design, performance, radiation mitigation principles and demonstrate how the suite fully addresses its scientific objectives.