

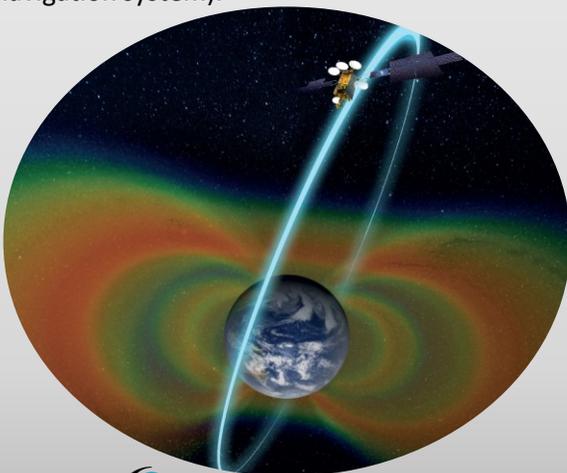
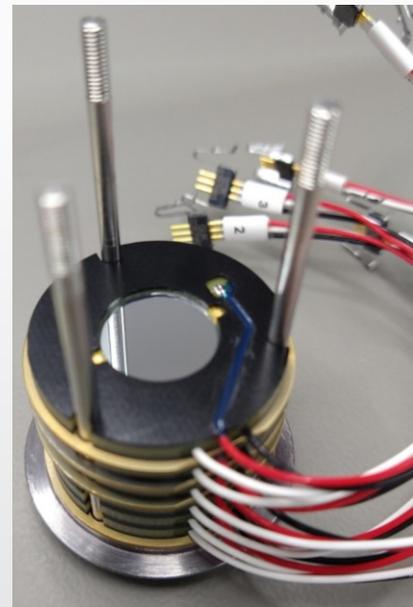
Space Weather/Radiation Detection

Measure kinetic energy of energetic charged particle radiation in space.

The instrument is designed to measure **electrons** in the range of 0.5 - 7 MeV and **protons** in the range of 7 - 200 MeV. Free electrons and protons can be found in earth orbit in varying amounts and energies. As they cause **radiation damage to space electronics** (as well as other materials and humans) it is important to map their density and energy, so that their impact can be modeled and predicted.

NORM uses a detector stack made up from silicon diodes and absorbers. Particles enter the instrument through a collimator. When they traverse the diodes, they produce an electrical current which is measured by the read-out electronics. Through analysis of these events the type and energy of the particle can be deduced.

The first flight of NORM will be on one of the satellites of the **Arctic Satellite Broadband Mission (ASBM)** managed by **Space Norway**. Launch is scheduled for 2023. These satellites will provide broadband coverage for the Arctic and will fly in a highly elliptical three apogee orbit (43000 x 8100 km) that crosses the earth's outer radiation belts. One use of the produced data will be in the planning of radiation protection for the next generation of Galileo satellites (Europe's navigation system).



NORM can be useful on other satellites as well. It supports various communication interfaces and can be tailored to mission requirements.

IDEAS has designed application-specific integrated circuit for radiation detectors and imaging systems since 1992. Many satellites and planetary probes make use of IDEAS-developed ASICs. The team at IDEAS designed and built NORM in less than three years, with the help of the Norwegian Space Agency, ESA, and support by the Forsvarets forskningsinstitutt. Space Norway provides the launch opportunity on their ASBM satellites.