



Turbulence Heating ObserveR – THOR: Mission overview and payload summary

Arno Wielders (1), Nathalie Boudin (1), Andris Vaivads (2), Yuri Khotyaintsev (2), Benoit Lavraud (3), Fouad Sahraoui (4), Rumi Nakamura (5), Chris Owen (6), Andrew Fazakerley (6), Zdenek Nemecek (7), Jan Soucek (8), Federica Marcucci (9), Robert Wimmer-Schweingruber (10), Alberto Retino (4), Martin Gehler (1), and Philippe Escoubet (1)

(1) ESTEC-ESA, The Netherlands, (2) IRFU, Sweden, (3) IRAP, France, (4) LPP, France, (5) IWF, Austria, (6) MSSL, United Kingdom, (7) Charles University, Czech Republic, (8) IAP, Czech Republic, (9) INAF-IAPS, Italy, (10) University of Kiel, Germany

The Turbulence Heating ObserveR (THOR) mission was selected as one of the three candidates of the Call for Medium Class Missions M4 in the European Space Agency's Science Programme with a launch planned in 2026. THOR is the first mission ever flown in space dedicated to plasma turbulence. THOR will lead to an understanding of the basic plasma heating and particle energization processes, of their effect on different plasma species and of their relative importance in different turbulent regimes. The THOR mission features one single spinning spacecraft with 10 scientific instruments focusing on particular regions in three different elliptical orbits around the Earth; pristine solar wind, Earth's bow shock and interplanetary shocks, and compressed solar wind regions downstream of shocks.

These regions are selected because of their differing turbulent fluctuation characteristics, and reflect similar astrophysical environments. The THOR mission, the conceptual design of the spacecraft and a summary of the payload will be presented. Furthermore, driving requirements and their implications for the spacecraft like Electromagnetic Compatibility and cleanliness will be discussed.