ESTEC, 24 April 2018

EUROPEAN SPACE AGENCY

SENIOR SCIENCE COMMITTEE FOR M5 (SSC-M5)

Recommendation on the selection of mission concepts to be candidates for the implementation of a medium-size, or M-class, mission (M5)

The Senior Science Committee for the M5 mission selection (hereafter SSC-M5) was appointed by the Director of Science of ESA and was requested to issue a recommendation about which mission concepts to select for study in view of the implementation of the M5 Medium mission.

The SSC-M5 had its final meeting in ESA-ESTEC, Noordwijk on 23-24 April 2018 to issue its recommendation, following the process described in Annexe 1.

Thirteen proposals were submitted by the Executive to the SSC-M5, i.e., (in alphabetic order) Alfven, Castalia, DePhine, e-ASTROGAM, EnVision, ESCAPE, Galileo Galilei (GG), Heavy Metal, Hera, Janus, SELMA, SPICA, and THESEUS.

The SSC-M5 evaluated both the scientific and programmatic aspects of the thirteen candidate missions, including scientific value, timeliness, potential impact, international context and overall strategy. Summary evaluations for the candidate missions are reported in Annexe 2.

Following the evaluation, the SSC-M5 recommends to the Director of Science three mission concepts, namely (in alphabetical order) EnVision, SPICA and THESEUS for a study phase.

The SSC-M5 considers that the EnVision mission will shed light on the current and historical geological activity of Venus and will contribute to the understanding of the formation process of the terrestrial planets through a comprehensive multi-scale approach to probe and map the entire planet, and in-depth investigations of its surface and subsurface and internal properties.

The SSC-M5 considers that SPICA will provide transformational advances in our understanding of the origin and evolution of galaxies, stars and planets by offering orders of magnitude improvement in far-infrared spectroscopic and survey capabilities. SPICA is also expected to complement the capabilities of existing and foreseen major observatories.

The SSC-M5 considers that THESEUS is a novel and compelling mission that promises to deliver exciting and far-reaching observations concerning the high-redshift Universe as well as the transient sky, in particular as follow-up of Gravitational Wave observations.