



Planetary exploration, Horizon 2061: A joint ISSI-EUROPLANET community foresight exercise

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We will present the preliminary results of a foresight exercise jointly implemented by the Europlanet Research Infrastructure project of the European Union and by the International Space Science Institute (ISSI) to produce a community Vision of Planetary Exploration up to the 2061 horizon, named H2061 for short. 2061 was chosen as a symbolic date corresponding to the return of Halley's comet into the inner Solar System and to the centennial of the first Human space flight. This Vision will be built on a con-current analysis of the four "pillars" of planetary exploration:

- (1) The key priority questions to be addressed in Solar System science;
- (2) The representative planetary missions that need to be flown to address and hopefully answer these questions;
- (3) The enabling technologies that will need to be available to fly this set of ambitious mis-sions;
- (4) The supporting infrastructures, both space-based and ground-based, to be made available.

In this science-driven approach, we will build our Horizon 2061 Vision in three following steps. In step 1, an international community forum convened in Bern, Switzerland on September 13th to 15th, 2016 by ISSI and Europlanet identified the first two pillars: key questions and representative planetary missions. The outputs of step 1 will be used as inputs to step 2, an open community meeting focusing on the identification of pillars 3 and 4 which will be hosted by the EPFL in Lausanne, Switzerland, on Jan. 29th to Feb. 1st, 2018. Ultimately, the four pillars identified by steps 1 and 2 will be discussed and compared in the "synthesis" meeting of step 3, which will take place in Toulouse, France, on the occasion of the European Open Science Forum 2018 (ESOF 2018).

Planetary Exploration Horizon 2061: scientific approach. Since 1995 and the discovery of the first exoplanet orbiting a main sequence star, we are living a revolution in planetary science: as of today, over 3000 exoplanets have been identified by a diversity of techniques, first by ground-based telescopes and more recently by space missions like Corot and Kepler. Many more are to come in the few decades ahead of us, bringing to our knowledge an ever-increasing num-ber of exoplanets. While the "exploration" of exoplan-etary systems will remain the privilege of space-based telescopes and remote sensing techniques for a long time, space exploration opens a far more detailed ac-cess to a far more limited number of systems and of constituting objects in the Solar System. Linking these two uniquely complementary lines of research lays the foundations of a new type of comparative science: the science of planetary systems. The science-based com-ponent of our foresight exercise is a contribution to this perspective which we will share with the EGU com-munity.