**Workshop in Support of ESA Initiative for Development of Ground Based Autonomous Rover Demonstrator for Exploration**

ESA has been working for many years in developing capabilities and competences in New Member States (NMS), Associate Members (AM), and countries part of the Plan for European Cooperating State (PECS). Many of these technology developments are directly applicable to, or have potential to be applicable to, the development of autonomous rovers. For these companies to progress further in this area, they need to be included in an activity led by an experienced prime or industry that is active in the ESA Exploration domain.

ESA is undertaking an initiative to develop a ground-based rover demonstrator to a) provide the opportunity to combine and further progress the existing competences currently being developed in these member states and b) to learn about, demonstrate and derisk autonomous technologies with potential for future rovers with the ambition to make a step jump in rover capabilities.

It is expected that this initiative will help establish the potential future development and path-to-flight for multiple new technologies and companies, that it will provide ESA a springboard with which to leapfrog to next generation rover capabilities and will also provide concrete and compelling reasons for such countries to see a valuable and concrete return on their investment in space and in particular to E3P.

The main goal of this initiative is therefore to design and develop the highly autonomous and cooperative rover technologies that would be needed to support a moon base and explore and exploit the lunar surface, and to demonstrate these on a versatile ground based autonomous rover demonstrator/test platform. This shall involve, in the first instance, to a maximum extent industries and research centres located in NMS, AM and PECS countries. A versatile and open architecture of the mobility solution is envisaged that enables easy and rapid upgrades, improvements and supplier swaps. This architecture will be defined and implemented by an experienced Prime who will oversee the development and testing.

Such an approach is expected to allow the comparison of different solutions for each element/ module whilst allowing an easy test-improve-test again development path. Whilst being a ground demonstrator, it is important that all modules/ elements used are designed with the path to space qualification and end envisaged application in mind.

Some examples of the building blocks or elements are: servo drives, drive trains, communications systems, navigation planning tools, sensors, power systems, terrain mapping and different navigation algorithms.