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THE EUROPEAN ASTRONAUT CENTRE (EAC), MOVING FROM ISS TO THE FUTURE SPACE EXPLORATION

Abstract

The European Astronaut Centre (EAC) is the home of European astronauts and core activities include two main chapters:

• The practice of space medicine aimed to minimize the risks to the health of the astronauts throughout their professional carrier, in particular before, during and after space missions and maximize their operational effectiveness.

• The training of ESA astronauts, including the planning and scheduling of their tasks and flight assignments, as well as preparation and implementation of their training programs for space missions to the International Space Station (ISS).

Future space exploration represents a challenge for technology and human performance. Congruent with international exploration roadmaps, the EAC is evolving to meet future operational exploration scenarios. A number of initiatives have been undertaken towards this objective, aimed at demonstrating important technologies at EAC, bridging the gap between science and operations, and looking for simultaneous Earth/Space applications.

As for space medicine, future long duration missions have increased medical risks, and a greater difficulty to provide medical support. However, even if the space environment is very specific, most of the medical challenges in space meet equivalent significant pathologies on Earth like the bone and muscle loss or cardiovascular impairment.

Also, EAC is developing a Lunar analogue test facility in order to address the identified need within Europe to provide a facility that can be readily made available to research groups and exploration focused stakeholders, while benefiting from the operational expertise present within EAC and developing a strong network with European research institutes and universities in the process.

Finally, EAC has initiated a project called 'Spaceship EAC'. This initiative aims to use the unique assets and expertise present at EAC for a broader set of ESA activities and to address upcoming exploration challenges. EAC is actively involving European wide partners and working towards making this facility a test-bed for technologies that are important for future human space exploration missions.

Taken as a whole, all these initiatives improve the skills and facilities present at EAC, building upon the established human exploration expertise and facilities. In addition to developing training and medical

skills/tools relevant for human exploration missions, EAC continues to apply this know-how to the relevant challenges of public health.

This promotes EAC as the center in ESA for human exploration operations and the unique site for ESA's space medicine activities.