

IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 3 (2C)

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SPACE EXPLORATION TECHNOLOGIES DEVELOPED BY AIR LIQUIDE FOR MOON
APPLICATIONS**Abstract**

Before 2030 the moon should see a return of humans on its soil. This time the aim will be to stay on our closest satellite and prepare humans for longer missions towards Mars. Thus, the moon will become an exciting playground for testing technologies and assessing permanent human life in space. However, a lot of technological gaps are present and need to be addressed before thinking of a sustainable activity on the moon. This is especially the case for space transportation (reliable lunar landers and rovers), habitat and human health (to provide efficient shelters for preserving human health) or ISRU (capability to use resources present on the moon). This paper presents the overall strategy and the key technologies under development at Air Liquide Campus Technologies Grenoble to support the development of space exploration. Air Liquide has a long history in space starting from cryocoolers and support to Ariane program, to now, space exploration technologies. The technologies under development cover a wide range of moon application: Regenerative Fuel Cell System (RFCS) for energy storage during lunar nights, CO₂ trapping for life support, O₂/H₂O extraction and gas purification for ISRU, Cryogenic Fluid Management System refueling technologies. . .