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OUTFITTING A LUNAR LABORATORY TO PERFORM SCIENTIFIC EXPERIMENTATION TO SERVE THE NEEDS OF THE SCIENTIFIC COMMUNITY ON THE MOON AND BEYOND

Abstract

In the coming decades, a significant shift in focus in the scientific community from LEO to Lunar orbit, the Lunar Surface and beyond is coming. While the environments and CONOPS vary between these destinations, the basic payload requirements of the scientific community remain the same.

The laboratory modules Nanoracks Europe has envisioned would serve as an extension of the scientific capability currently in LEO and provide research institutions and commercial customers alike the opportunity to rapidly and effectively develop experiments geared toward studying the Moon, Mars, and beyond. These laboratories are conceived to be promptly upgraded based on the immediate needs of the scientific community, by utilizing removable experiment bays, standard mechanical and electrical interfaces and standard instrumentation commonly used in a laboratory setting.

The outfitted laboratories plan to be an intuitive and familiar space for crew members as they are conceived as an evolution of the laboratory environments on the International Space Station. Work benches, sinks, fluid reservoirs and examination tables will allow crew members to assemble, run and modify experiments as well as take essential vital information to perform life science experiments to better understand the effect of the various space environments on the Human body.

The goal is to provide comprehensive services to large integrators and space agencies to outfit spacecraft and habitats with the equipment necessary to host a wide range of scientific payloads from diverse institutions. This will enable access to space to a greater number of researchers, interested in performing their experiments in these unique environments, by streamlining the integration and CONOPS of their experiments.