

IAF HUMAN SPACEFLIGHT SYMPOSIUM (B3)
Governmental Human Spaceflight Programmes (Overview) (1)

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ARTEMIS III AND BEYOND

Abstract

Artemis is an increasingly complex set of missions bringing humanity into the next era of exploration. With the success of Artemis I, NASA is preparing for the first crewed test flight of the Space Launch System (SLS) rocket, Orion spacecraft, and advanced exploration ground systems — Artemis II. Simultaneously, work is well underway, with hardware being built across the country and around the world, for missions through Artemis V. On Artemis III, NASA will send two astronauts in the first industry-designed human landing system to an uncharted region of the Moon: the lunar South Pole. This represents an unprecedented opportunity for lunar research and demonstration of modern technology. Advanced extravehicular activity systems, including industry-designed suits, will allow astronauts to navigate the unforgiving environment and collect precious samples and data. Starting with Artemis IV, the first lunar-orbiting space station in history, Gateway, will be assembled in a Near-Rectilinear Halo Orbit. The core Power and Propulsion Element and Habitation and Logistics Module, launched on an industry-provided vehicle, will be the first Gateway elements to arrive in lunar orbit. Next, taking full advantage of the increased capability of NASA's SLS Block 1B configuration, the International Habitat will launch, along with the crew and their supplies in the Orion spacecraft. In addition to the incredibly complex and precise rendezvous, proximity operations, and docking needed to integrate these modules, two of the Artemis IV crew will complete a surface expedition. Artemis V will expand capabilities in orbit and on the lunar surface. External robotic capabilities and a refueling module, both provided by international partners, will increase the science that can be done during crewed and uncrewed periods. Via the station, two astronauts will board a commercially developed human landing system for another surface expedition. An unpressurized rover, LTV, will allow the crew to extend their reach and collect samples from a more diverse range of scientifically interesting areas. On missions Artemis VI and beyond, surface payload deliveries of rovers, habitats, power systems, and supplies will grow a sustainable lunar infrastructure. Each Artemis mission will increase our knowledge, refine operations, and prove new technologies as we prepare for human missions to Mars. This paper will describe current plans for Artemis III through V, provide an update on work for those missions, and detail how NASA and its partners are designing Artemis to prepare us for human travel to other worlds.