| 第18回宇宙科学・探査小委員会 |
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| 資料2-1 |

FY 2019 Budget Request Deep Space Exploration Systems

(\$ Millions)

| | FY2017 | FY2018 | FY2019 | FY2020 | FY2021 | FY2022 | FY2023 |
|---------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| Deep Space Exploration Systems | 4,184.0 | 4,222.6 | 4,558.8 | 4,859.1 | 4,764.5 | 4,752.5 | 4,769.8 |
| Exploration Systems Development | | | 3,669.8 | | | | |
| Exploration Ground Systems | | | 428.2 | | | | |
| Orion Program | | | 1,163.5 | | | | |
| Space Launch System | | | 2,078.1 | | | | |
| Advanced Exploration Systems | | | 889.0 | | | | |
| Adv Cislunar and Surface Capabilities | | | 116.5 | | | | |
| Exploration Advanced Systems | | | 268.2 | | | | |
| Lunar Orbital Platform - Gateway | | | 504.2 | | | | |

The FY 2019 Budget includes a new account structure for human space exploration and technology programs to improve alignment of funding with NASA's new strategic space exploration objectives.

• Exploration Systems Development (ESD)

- ESD programs are working together to build the space transportation system made up of the Orion crew vehicle, Space Launch System (SLS) rocket, and Exploration Ground Systems (EGS). This system will enable the Agency's new mission to extend human presence into the solar system, starting with a return to the Moon. The Exploration Mission (EM)-1 uncrewed test flight is planned for FY 2020 and EM-2 first crewed flight is planned for 2023.
- The Orion program will continue final assembly and testing of the EM-1 crew vehicle at KSC and continue hardware production of the EM-2 crew vehicle at MAF and KSC.
- The SLS rocket's production and certification for flight will continue at MAF and MSFC along with engine and core stage testing at SSC. Key rocket components will deliver to EGS at KSC for integration into the final flight launch vehicle with the Orion crew vehicle.
- EGS will continue to prepare launch infrastructure and operations requirements in support of the SLS and Orion programs. Modifications to existing facility and command and control systems will be ongoing.
- NASA will explore approaches for reducing the costs of future exploration missions to enable a more expansive exploration program.

Advanced Exploration Systems

- Exploration Advanced Systems (EAS) focuses on advanced design, development, and demonstration of exploration capabilities to reduce risk, lower life cycle cost and validate operational concepts for future human missions to deep space. EAS leads development of new approaches to project and engineering management, such as rapid systems development or alternative management concepts, open innovation, and collaboration.
- Lunar Orbital Platform Gateway (LOP-G) will establish a platform to mature necessary short- and long-duration deep space exploration capabilities through the 2020s. The LOP-G

will be assembled in orbit around the Moon where it can also be used as a staging point for missions to the lunar surface and to destinations in deep space, providing a flexible human exploration architecture. LOP-G can be evolved depending on mission needs (exploration, science, commercial and international partners), as there are various concepts for its configuration. Current analysis is that the initial functionality will include four main elements: a Power and Propulsion Element (PPE), a small habitation element, airlock element(s) to enable Extra-Vehicular Activities (EVA), utilization, and required logistics element(s).

- Advanced Cislunar Surface Capabilities (ACSC) plans to develop a series of progressively more capable robotic lunar missions to the surface of the moon. ACSC will use innovative approaches to engage U.S. industry capabilities and possible international partners as the agency moves toward human exploration of the lunar surface.

EXPANDING HUMAN PRESENCE IN PARTNERSHIP

CREATING ECONOMIC OPPORTUNITIES, ADVANCING TECHNOLOGIES, AND ENABLING DISCOVERY

Now

Using the International Space Station 2020s Operating in the Lunar Vicinity (proving ground) After 2030 Leaving the Earth-Moon System and Reaching Mars Orbit

Phase 0

Continue research and testing on ISS to solve exploration challenges. Evaluate potential for lunar resources. Develop

Phase 1

Begin missions in cislunar space. Initiate next key deep space capability.

Phase 2

Complete next deep space capability and checkout.

<u><参考>LOP-Gの構築に関するNASA公開資料(2018.3)</u>

LUNAR ORBITAL PLATFORM-GATEWAY DEVELOPMENT

Establishing leadership in deep space and preparing for exploration into the solar system

