

**UNITED NATIONS COMMITTEE  
ON THE PEACEFUL USES OF  
OUTER SPACE (UNCOPUOS)**

Vienna, Austria

June 2, 2022

# **Progress and Plans for Deep Space Human Exploration**

**Jim Free**

**Associate Administrator  
Exploration Systems Development  
Mission Directorate**

**NASA Headquarters, Washington, D.C.**



Image credit: Andrew McCarthy

[www.nasa.gov](http://www.nasa.gov)



WE ARE GOING

ONLINEUN GANDA WÖMEN QÜ  
IDZIEMY NÖS VAMOS AMF  
WIR GEHEN UNLINEUN GANDA AMF  
WATASHITACHIHA IKU  
WIR GEHEN UNLINEUN GANDA AMF  
WATASHITACHIHA IKU

WIR GEHEN UNLINEUN GANDA WÖMEN QÜ  
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WATASHITACHIHA IKU



# ARTEMIS I





# ARTEMIS II



ARTEMIS II CREW MODULE  
KENNEDY SPACE CENTER



ARTEMIS II BOOSTER MOTOR  
SEGMENTS COMPLETE



ARTEMIS II RS-25 ENGINES COMPLETE



ARTEMIS II SERVICE MODULE  
KENNEDY SPACE CENTER



ARTEMIS II 4/5 CORE STAGE ASSEMBLED



# ARTEMIS III



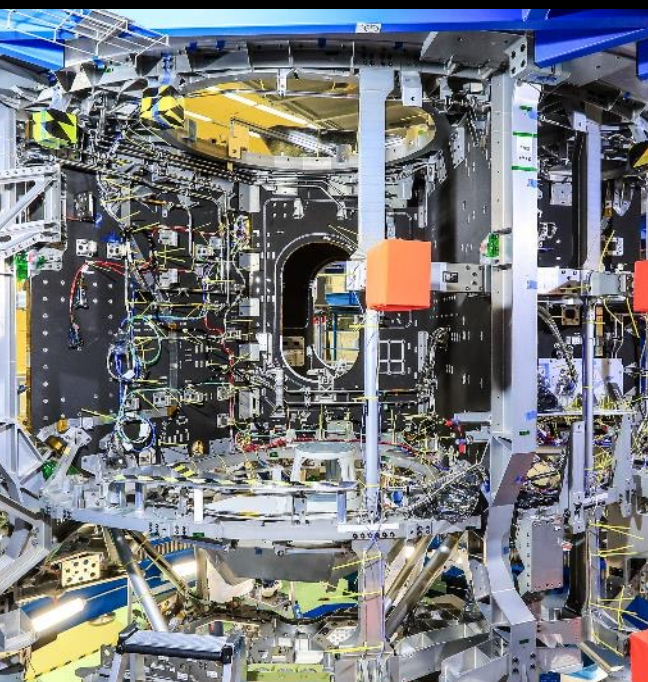
ARTEMIS III CREW MODULE  
KENNEDY SPACE CENTER



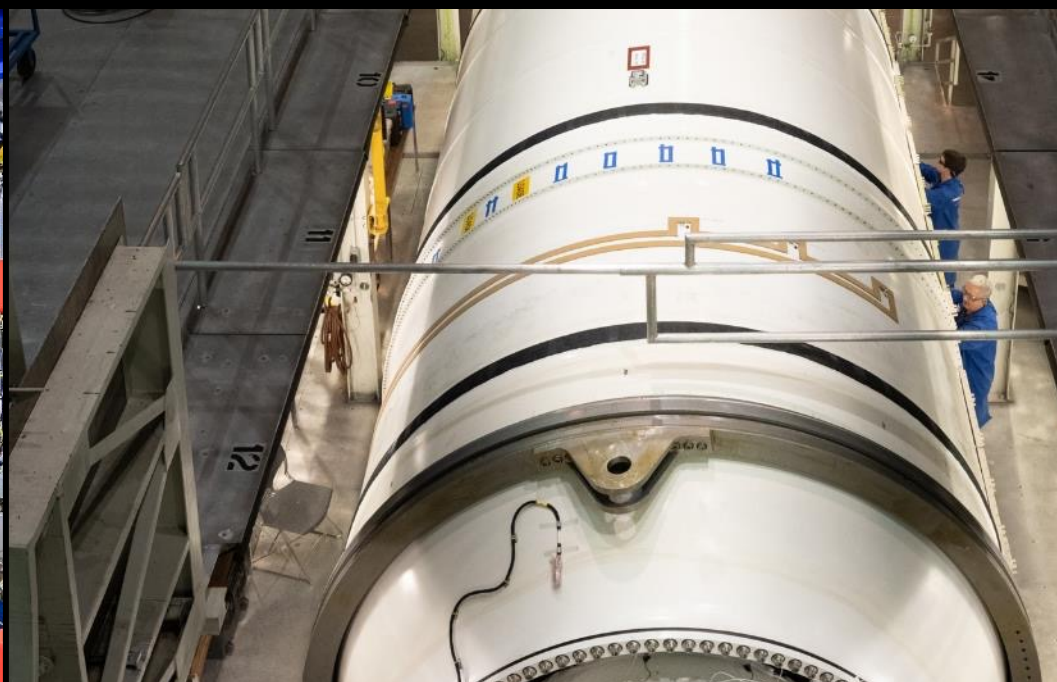
ARTEMIS III RS-25 FLIGHT  
SET PROCESSING



ARTEMIS III  
CORE STAGE LH2 TANK



ARTEMIS III ESM3  
BREMEN, GERMANY



ARTEMIS III BOOSTER SEGMENTS



ARTEMIS III ICPS



# ARTEMIS III



Image Credit: SpaceX

B4 AND S20 STACKED  
AUGUST 2021





# ARTEMIS IV



ARTEMIS IV ESM4  
TURIN, ITALY



ARTEMIS IV / B1B EUS INTERSTAGE  
WELD CONFIDENCE DEVELOPMENT ARTICLE



ARTEMIS IV CREW MODULE  
PRIMARY STRUCTURE



RS-25 "RESTART" ENGINE NOZZLE JACKET



# NASA's Moon to Mars Objectives

A blueprint for future human exploration

## TRANSPORTATION AND HABITATION

Develop and demonstrate an integrated system to conduct human missions. Live and work at deep space destinations and safely return to Earth.

## LUNAR AND MARS INFRASTRUCTURE

Maintain continuous robotic and human presence on the Moon with multiple international and industry users to develop a robust lunar economy.

Create the infrastructure to support initial human Mars demonstration.

## OPERATIONS

Conduct human missions on and around the Moon followed by missions to Mars

Use a gradual approach to build, demonstrate, and operate new technologies to live and work on other planetary bodies

## SCIENCE

Conduct science on and around the Moon, using humans and robots to address scientific priorities about the Moon.

Demonstrate future science methods astronauts can use beyond Low Earth Orbit:

- Lunar/Planetary
- Heliophysics
- Biological/Physical
- Astrophysics

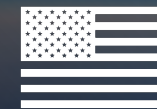
Requested feedback on these objectives in May 2022 from the following key stakeholders:



NASA workforce:  
our greatest asset



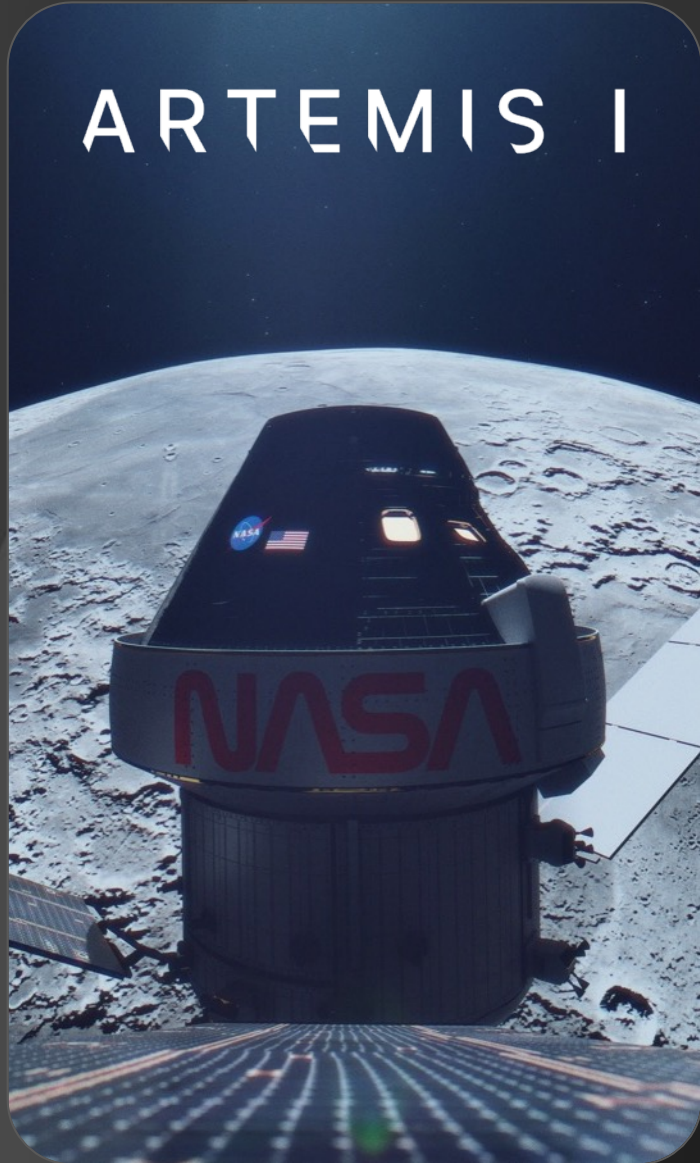
International partners: our key  
current and future, anticipated  
collaborators



U.S. industry, academia, etc.:  
our national leaders in space  
research and capabilities



# International Collaboration for Artemis Missions

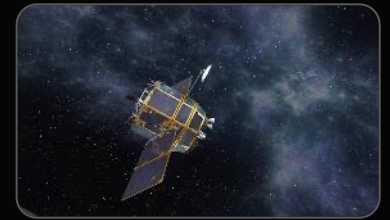


## European Service Module

Led by ESA with suppliers across Europe



## Artemis Accords



## Korea Pathfinder Lunar Orbiter

Korea Aerospace Research Institute (KARI)

## Artemis I International Secondary Payloads



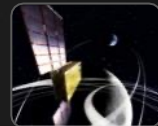
**ESA Active Dosimeters**  
European Space Agency (ESA)



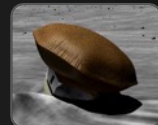
**MARE**  
Israeli Space Agency (ISA) & German Space Agency (DLR)



**ArgoMoon**  
Italian Space Agency (ASI)



**EQUULEUS**  
Japan Aerospace Exploration Agency (JAXA) & University of Tokyo

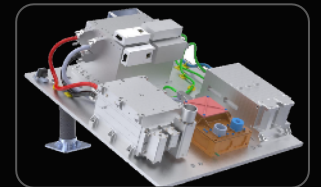


**OMOTENASHI**  
Japan Aerospace Exploration Agency (JAXA) & University of Tokyo

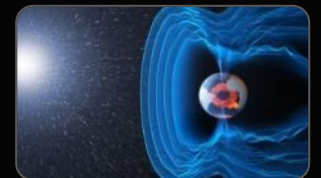


## Artemis Gateway

## Early Gateway Science Payloads



**ERSA Radiation Instrument Package**  
European Space Agency (ESA)

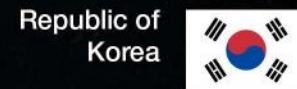


**Internal Dosimeter Array**  
European Space Agency (ESA) with instruments provided by Japan Aerospace Exploration Agency (JAXA)





# ARTEMIS ACCORDS



United for Peaceful Exploration of Deep Space



We came in peace.

**We return for all humanity.**

