Phil Root, Ph.D.

Office Director, Strategic Technology Office

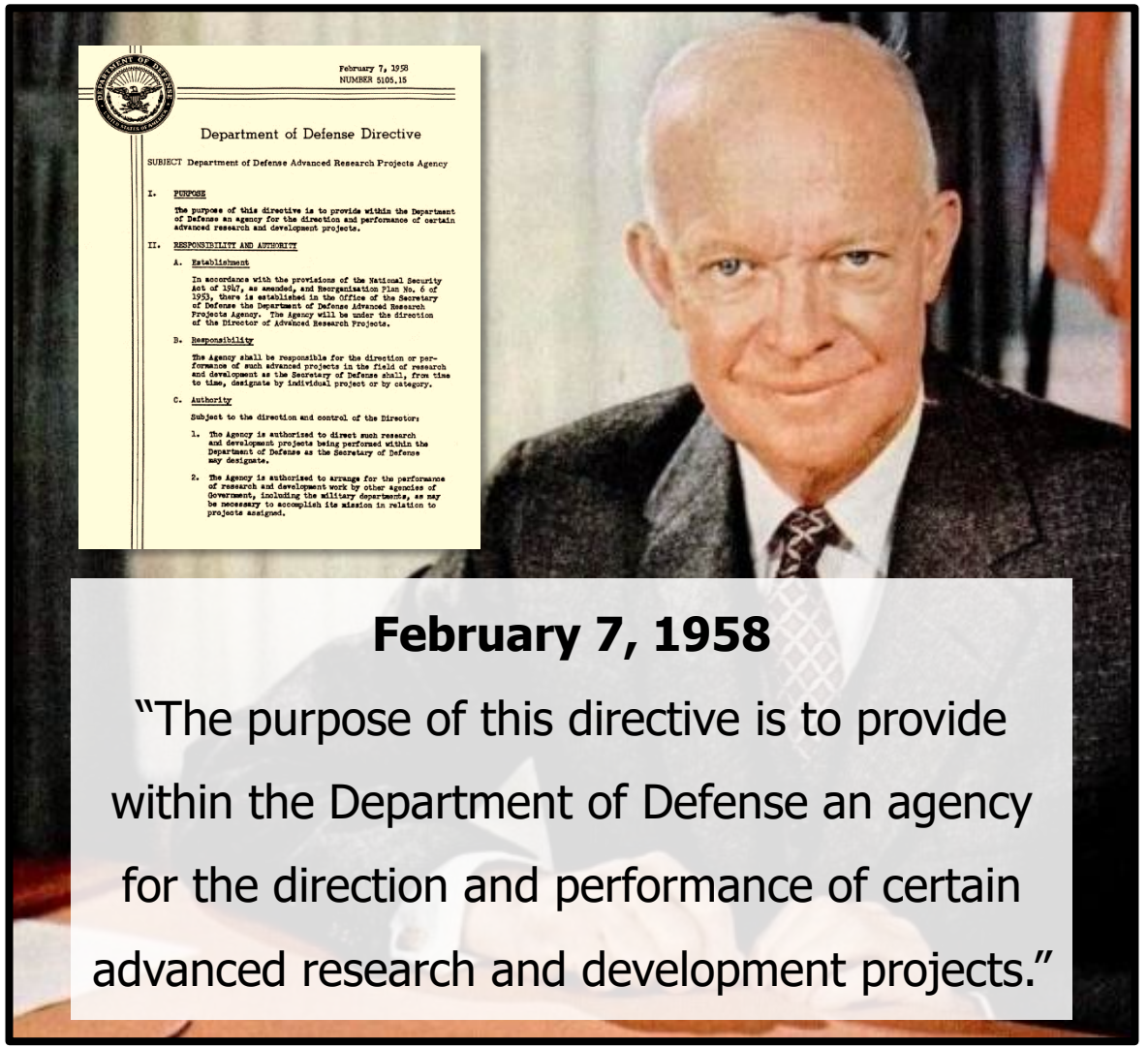
LSIC Spring Meeting

April 25, 2024

Origins

October 4, 1957

U.S.S.R. beats U.S. to space with Sputnik satellite; U.S. should never again be surprised by technology.



February 7, 1958
NUMBER 5105.15

Department of Defense Directive

SUBJECT Department of Defense Advanced Research Projects Agency

I. PURPOSE

The purpose of this directive is to provide within the Department of Defense an agency for the direction and performance of certain advanced research and development projects.

II. RESPONSIBILITY AND AUTHORITY

A. Establishment

In accordance with the provisions of the National Security Act of 1947, as amended, and Reorganization Plan No. 6 of 1953, there is established in the Office of the Secretary of Defense the Department of Defense Advanced Research Projects Agency. The Agency will be under the direction of the Director of Advanced Research Projects.

B. Responsibility

The Agency shall be responsible for the direction or performance of such advanced projects in the field of research and development as the Secretary of Defense shall, from time to time, designate by individual project or by category.

C. Authority

Subject to the direction and control of the Director:

1. The Agency is authorized to direct such research and development projects being performed within the Department of Defense as the Secretary of Defense may designate.

2. The Agency is authorized to arrange for the performance of research and development work by other Agencies of Government, including the military departments, as may be necessary to accomplish its mission in relation to projects assigned.

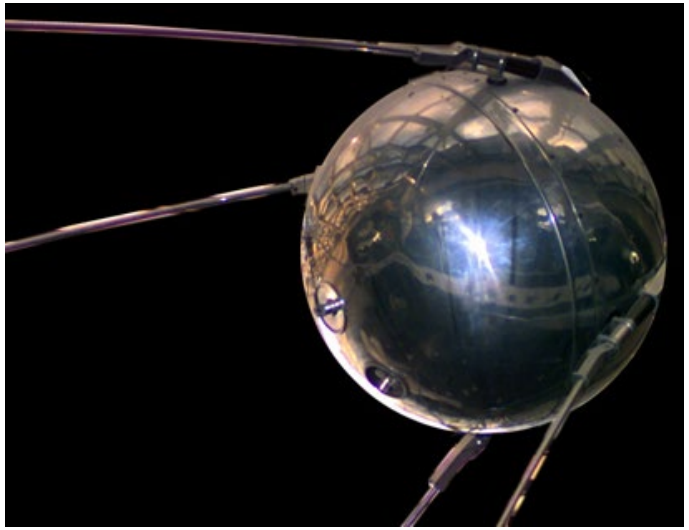
February 7, 1958

"The purpose of this directive is to provide within the Department of Defense an agency for the direction and performance of certain advanced research and development projects."

Why DARPA and the Moon?

65 years after DARPA's founding:
Uphold mission to prevent strategic surprise

THEN (Sputnik)



Soon

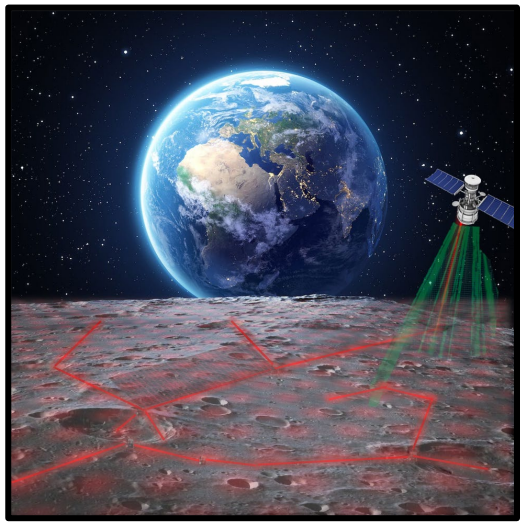
ICON's Project Olympus for NASA and commercial lunar projects,
https://iconbuild.com/lunar-construction

DARPA's hypothesis:
A lunar commercial infrastructure would catalyze economic activity, and thereby accelerate the US-led establishment of international norms.

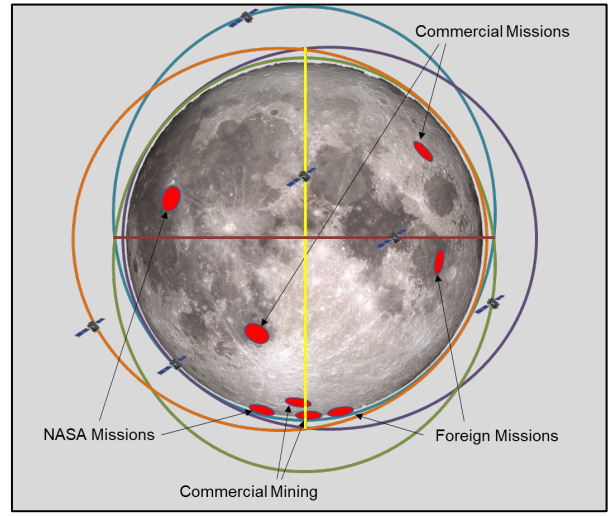
LunA-10, LOGIC, SHALE RFI

10-year Lunar Architecture (LunA-10)

Lunar Operating Guidelines for Infrastructure Consortium (LOGIC)



Six Hypotheses for Accelerating the Lunar Economy (SHALE)



Technology

Awardees Announced in November 2023

Interoperability

Currently **804** members

15% Academic
49% Industry
22% Government
11% Nonprofit
3% Other

Scalability

What direction is DARPA exploring?

Push from individual self-service to commercial multi-service

Push from government as a sole sponsor to commercial as a customer

For a given service or unit: what are the inputs/outputs/limitations?

What DARPA-hard technical challenges must be surmounted to create a sustainable lunar economy by 2035?

LunA-10 performers arranged by (initial) services

Market Analysis and Logistics:

FIREFLY AEROSPACE

Power:

BLUE ORIGIN

HONEYBEE ROBOTICS

FIBERTEK, INC.

Mining & ISRU:

CISLUNAR INDUSTRIES

SIERRA SPACE

HELIOS

Communications, Position, Navigation, and Timing:

crescent

REDWIRE

Transit and Mobility:

NORTHROP GRUMMAN

SPACEX

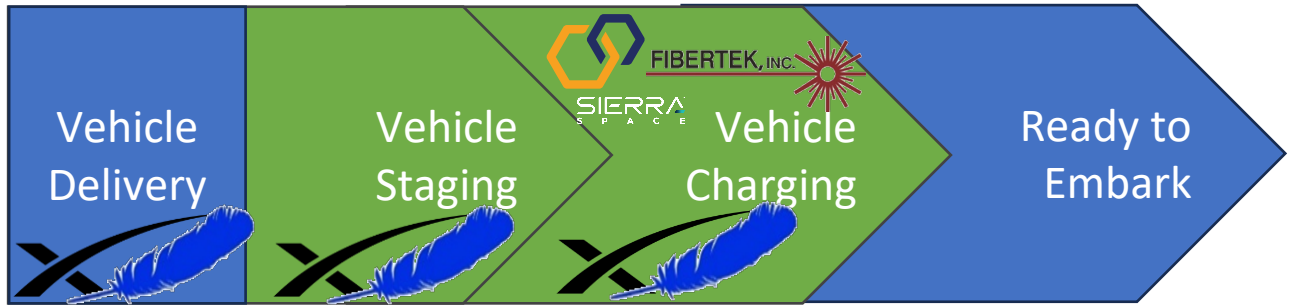
Construction & Robotics:

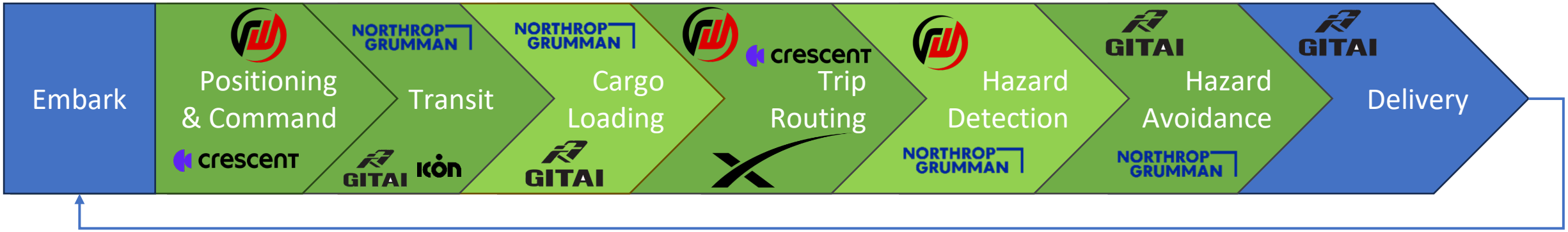
GITAI

ICON

Enterprise Value Chain Logistics and Transportation

"Pioneer Path" Rover



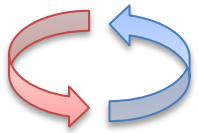


Element is being addressed in LunA-10

Element is tentatively addressed in LunA-10

Element not presently addressed in LunA-10

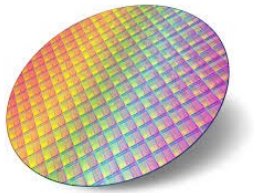
SHALE RFI: Six Hypotheses for Accelerating the Lunar Economy



Centralized thermal rejection and generation as a service

Widespread orbital lunar prospecting and surveying

Source: inhabitat.com



Source: waferworld.com

Creating large silicon wafers for microsystems on the Moon

Biomanufacturing to accelerate lunar construction

Source: technology-innovators.com

Source: gbl.co.il

New concepts to increase refinement rates in low gravity

New concepts for lunar position, navigation and timing

Source: linkedin.com

One day closer