



Exploration & **SPACE**  
Communications

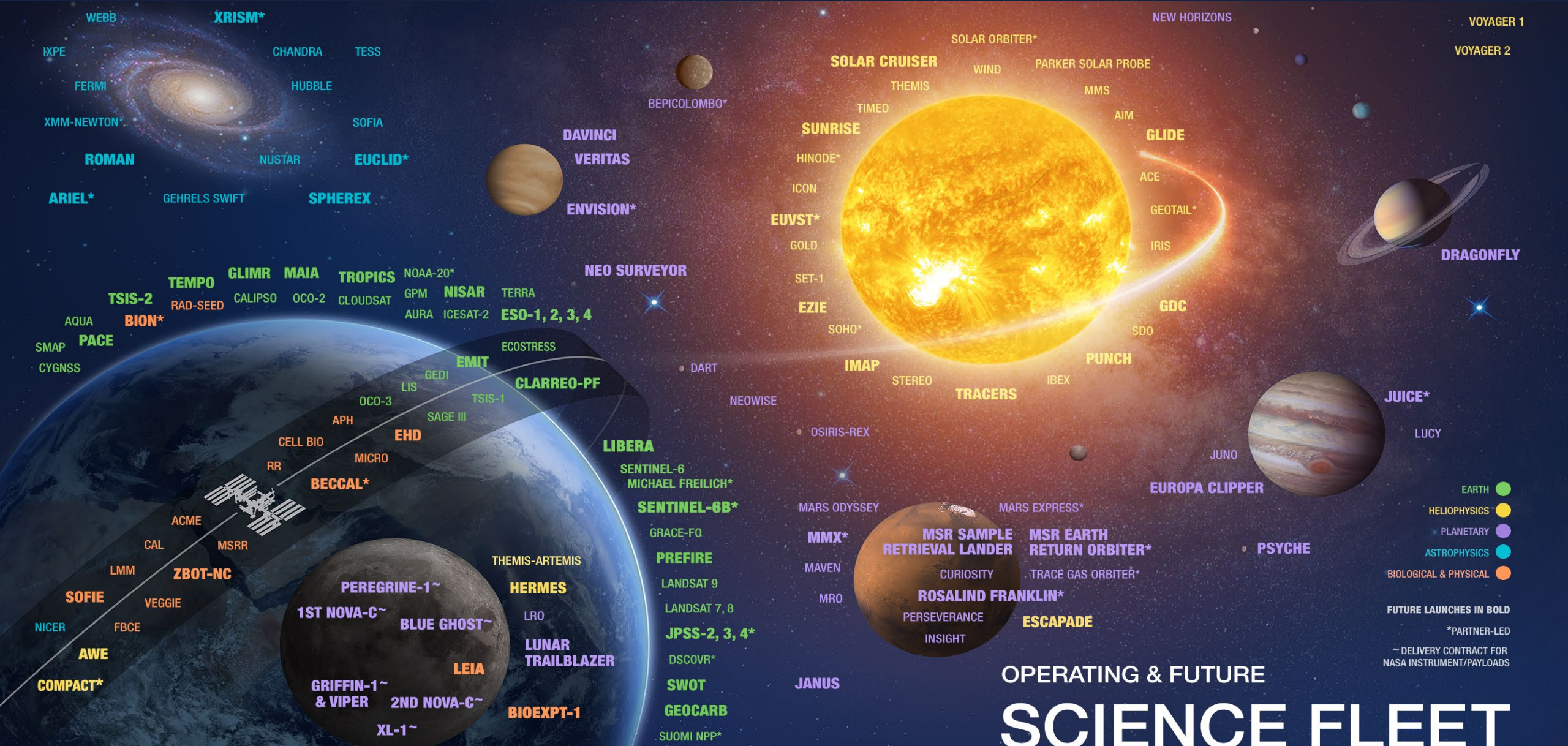
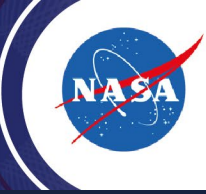
## *NASA's CIS Office: Embracing the Aerospace Community Through Strategic Engagement*

Ruma Das | CIS Deputy Chief | February 2023

*More than you ever imagined...*

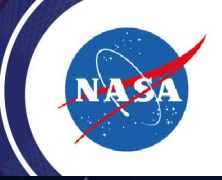


# Exploration



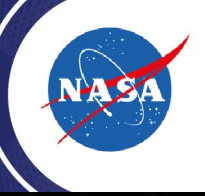
## OPERATING & FUTURE SCIENCE FLEET

# NASA's Space Communications Networks



 Near Space Network  
 Deep Space Network

# Network Regimes



## Regime

NEAR SPACE

DEEP SPACE



## Range from Earth

**Earth Proximity**  
Below 36,000 km

**Lunar Proximity**  
70,000 km from  
center of Moon

**Earth-Moon L1/L2**  
61,000 km from  
center of Moon

**Cislunar**  
455,000 km

**Sun-Earth L1/L2**  
1.5M km

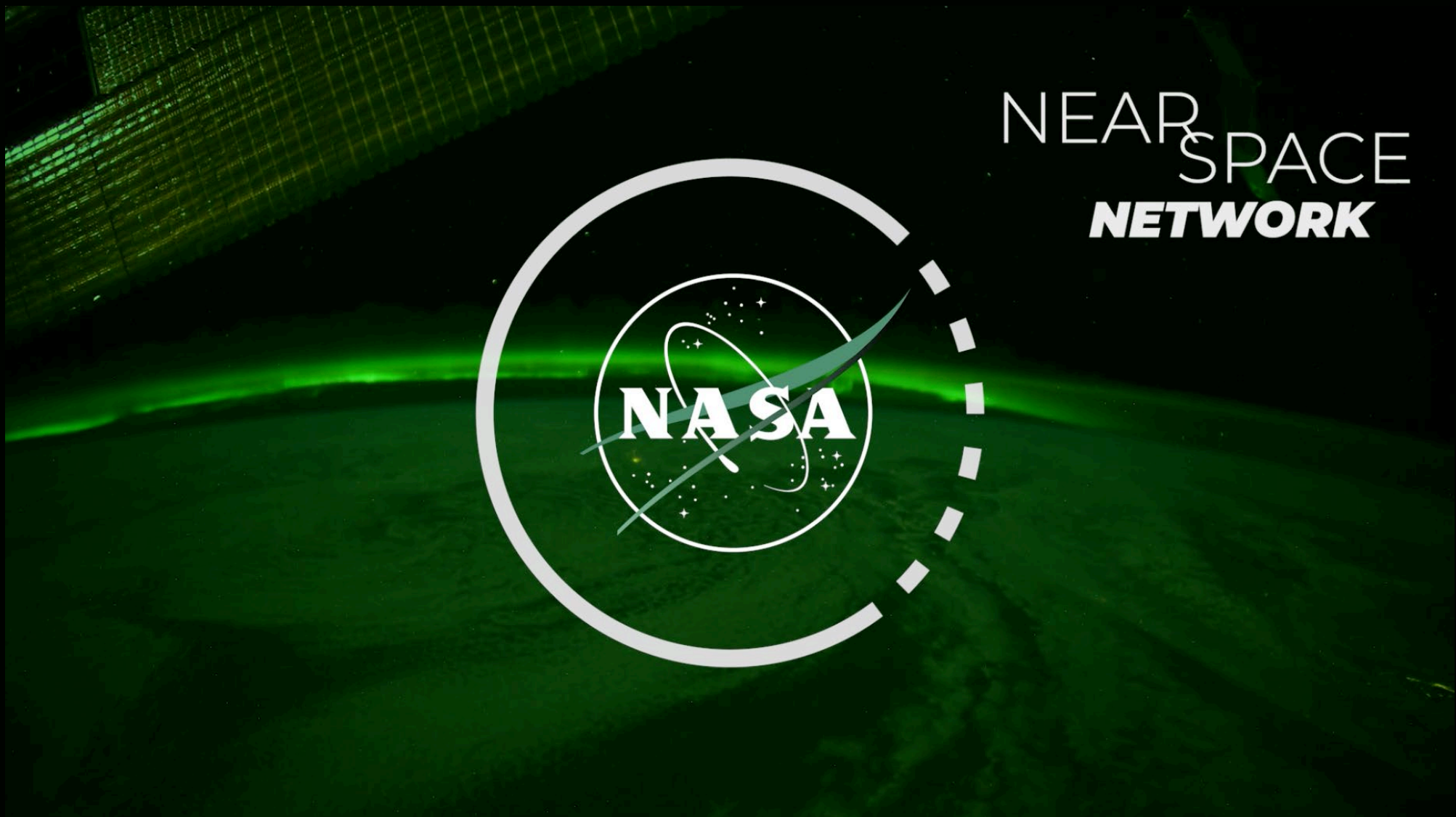
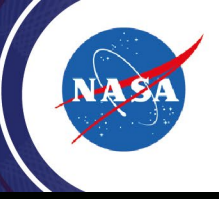
**Deep Space**  
> 2M km

## Notation

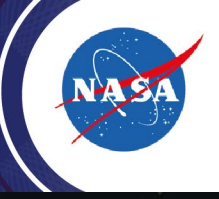
Near Space is considered from 80 km to 2 million km from the Earth

> 2M km from Earth is considered Deep Space

# Our Network: The Near Space Network



# Our Goal: Partnerships & Interoperability



## COMMERCIAL

### PUBLIC / PRIVATE PARTNERSHIPS

Embracing the expanding aerospace industry to bring new expertise and cost savings to the government.

## NASA + INDUSTRY

## GOVERNMENT

### AGENCY PARTNERSHIPS

Collaborating with national and international agencies for interoperability and maximized capabilities

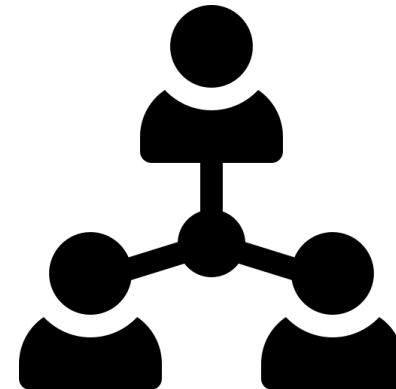
## NASA + OGAs

# Embracing the Aerospace Community



## The Commercialization, Innovation, & Synergies Office:

- Gathers new commercial providers for the Near Space Network.
- Fosters relationships with industry, government agencies, and mission teams.
- Encourages interoperability by engaging with the broader aerospace community.
- Gathers information about current and upcoming space communications technologies and capabilities.
- Hosts interactive and collaborative exchanges to increase knowledge and idea sharing in the space communications and navigation sector.



# Who Do We Engage?



## MISSION ENGAGEMENT

Who: Mission Teams

How: Promoting NSN Services and Capabilities

Result: Onboarding Missions



## INDUSTRY ENGAGEMENT

Who: Large and Small Aerospace Companies

How: Hosting numerous events and 1:1 meetings

Result: Incorporating Commercial Capabilities



## CIVIL & DEFENSE SPACE PARTNERSHIPS

Who: Other Government Agencies

How: Collaborative Sessions

Result: An Interoperable Space Ecosystem





# Requests for Information

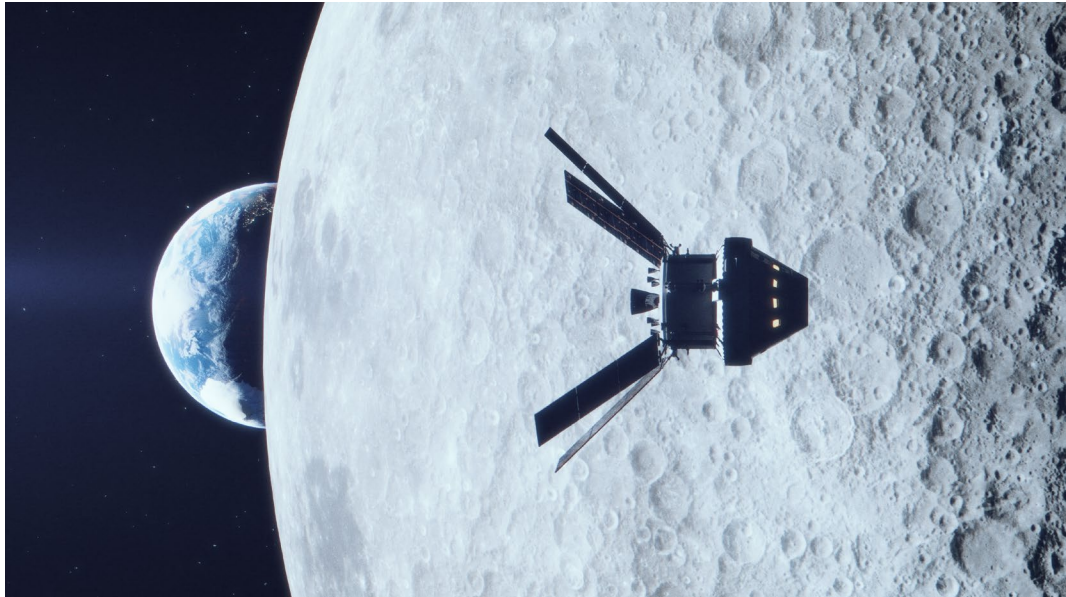


## Track the Artemis I Mission

**Goal:** Understand non-NASA tracking capabilities on a non-interference basis

**Released:** August 2022

**Status:** 20 organizations responded – undergoing data analysis



## Low-Cost Optical Terminals

**Goal:** Understand industry's interest in contributing to optical ground terminals or experimenting with an existing one.

**Released:** January 2023

**Status:** Open to responses. Due March 6, 2023.



# Broad Agency Announcements (BAA)



## Near Space Communications Capabilities NextSTEP-2 BAA

- **Goal:** to develop capability studies to explore and demonstrate communications and navigation services in support of Artemis missions to the Moon.
- Awarded under the [Next Space Technologies for Exploration Partnerships-2 \(NextSTEP-2\) Broad Agency Announcement \(BAA\) Appendix O](#).
- **Status:** Two companies selected: Kongsberg Satellite Services (KSAT) USA and the SpaceLink Corporation.

Another CIS-sponsored BAA will be released in spring 2023.





## Draft Request for Proposal: Near Space Network Services

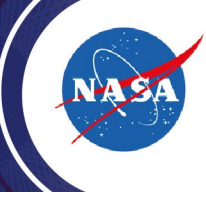
**Goal:** Solicits industry space relay and/or direct-to-Earth communications and navigation services for the Near Space Network.

**Status:** Formal Request for Proposal coming in 2023.

**Draft RFP:** <https://bit.ly/3JT0hm2>

**Engagement:** Two Industry Days conducted in 2022. Over 300 people attended.

# Engagement Highlights – Industry



**The industry engagement team hosts events to hear from and talk to the aerospace community about new capabilities and potential provider integration into the network.**



## Topics Included:

- RF Compatibility Testing and Future Innovation
- Integration of Optical Ground Terminals into Network Operations
- Optical Communications Standards
- Delay/Disruption Tolerant Networking (DTN)
- Lunar Interoperability Standards
- Digital Signal Processing in the Cloud (Software Defined Radios in Cloud)
- Cislunar Position, Navigation, and Timing
- Lunar 3GPP / 5G

Supported NASA's first annual Delay/Disruption Tolerant Networking (DTN) Face-to-Face.

Presented to over 100 participants from 44 companies, agencies, and teams.

Explored state-of-the-art DTN solutions from industry and government.

Hosted a OneLink keynote presentation and a Reverse Industry Day to provide broad market analysis.

Brought together over 120 industry professionals and conducted 18 one-on-one sessions with interested companies.

# Engagement Highlights – Civil and Defense



**The civil and defense space partnership team fosters relationships with national and international government agencies to establish space act agreements and promote network capabilities.**

**Engaged over 300 individuals from other government agencies by hosting:**

- 7 Connection Sessions events
- 30 one-on-one briefings

**Topics Included:**

- Wideband Networking
- Lunar Networking
- Commercial Space Partnerships
- Commercializing Communications

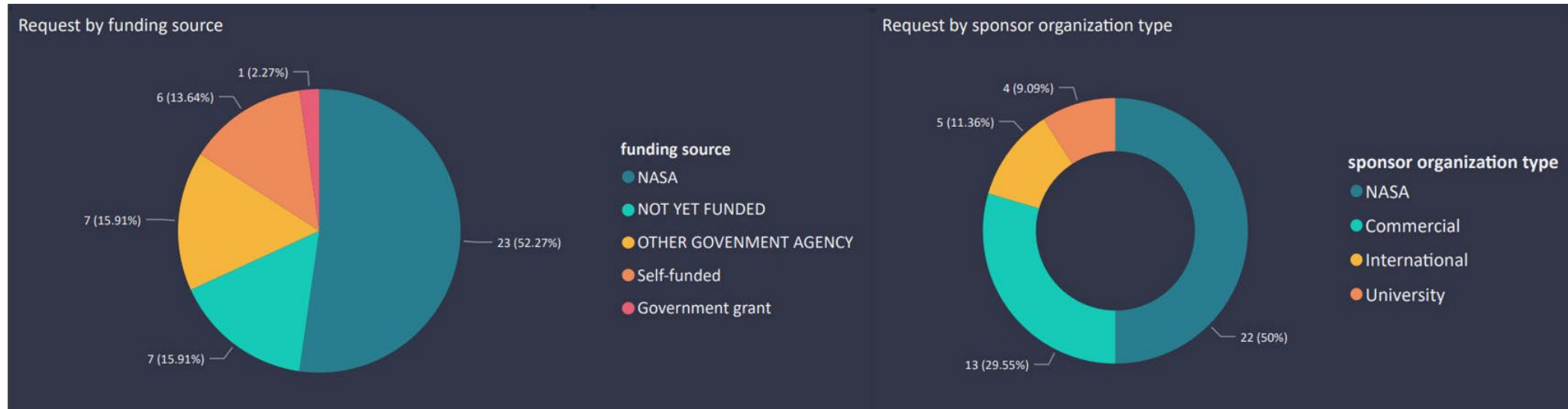
**CONNECTION  
SESSIONS**



# Engagement Highlights – Mission Teams



The mission engagement team educates upcoming and existing missions on Near Space Network services and new technology infusion efforts that will benefit the user.



- Received **73** Service Inquiry Requests and forwarded those to the NSN Advanced Planning Team for analysis.
- Hosted 14 Mission Engagement Sessions to educate stakeholders.
- Requests were from domestic and international organizations with several different types funding sources.

# Engage with Us



## How to engage with CIS:

- Join our distribution list:
  - Get updates about RFPs, RFIs, BAAs, and all of our engagement events.
- Inquire about services through our “Service Inquiry Form”
- Reach out about specific questions or topics to our email [nasa-commercialsynergies@mail.nasa.gov](mailto:nasa-commercialsynergies@mail.nasa.gov)

