

Space Communications and Navigation (SCaN) Overview

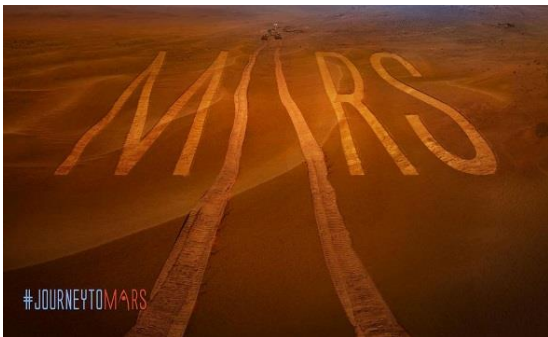
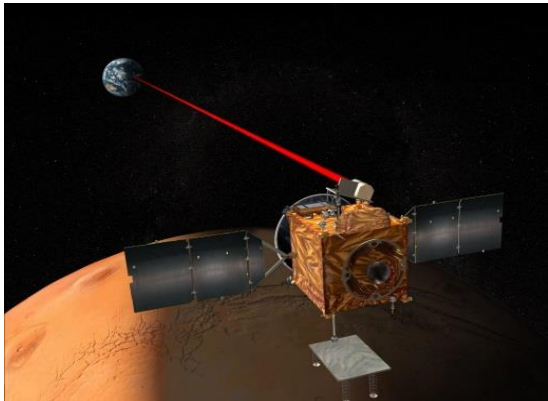
EVM-3 Preproposal Conference

December 2020

Agenda

- ❑ Space Communications and Navigation (SCaN) overview
- ❑ AO Considerations and Requirements
- ❑ Spectrum Access & Licensing
- ❑ SCaN's Mission Commitment Offices
- ❑ Points of contact

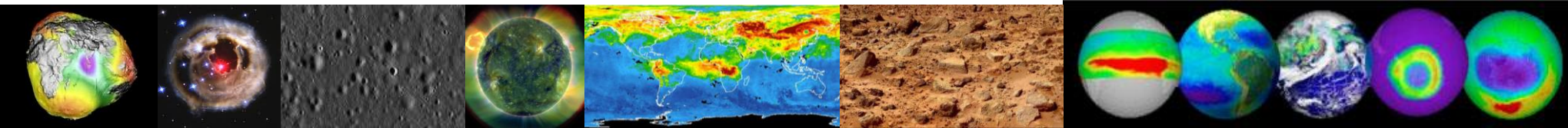
SCaN is Responsible for all NASA Space Communications



- ❑ Responsible for Agency-wide operations, management, and development of all NASA space communications capabilities and enabling technology.
- ❑ Expand SCaN capabilities to enable and enhance robotic and human exploration.
- ❑ Manage spectrum and represent NASA on national and international spectrum management programs.
- ❑ Develop space communication standards as well as Positioning, Navigation, and Timing (PNT) policy.
- ❑ Represent and negotiate on behalf of NASA on all matters related to space telecommunications in coordination with the appropriate offices and flight mission directorates.

Supporting Over 100 Missions

- ❑ SCaN supports over 100 space missions with the three networks.
 - Which includes every US government launch and early orbit flight
- ❑ Earth Science
 - Earth observation missions – Global observation of climate, Land, Sea state and Atmospheric conditions.
 - Aura, Aqua, Landsat, Ice Cloud and Land Elevation Satellite (ICESAT-2), Orbiting Carbon Observatory (OCO-2)
- ❑ Heliophysics
 - Solar observation-Understanding the Sun and its effect on Space and Earth.
 - Parker Solar Probe, Solar Dynamics Observer (SDO), Solar Terrestrial Relations Observatory (STEREO)
- ❑ Astrophysics
 - Studying the Universe and its origins.
 - Hubble Space Telescope, Chandra X-ray Observatory, James E. Webb Space Telescope (JWST), WFIRST
- ❑ Planetary
 - Exploring our solar system's content and composition
 - Voyagers-1/2, Mars Atmosphere and Volatile Evolution (MAVEN), InSight, Lunar Reconnaissance Orbiter (LRO)
- ❑ Human Space Flight
 - Human tended Exploration missions, Commercial Space transportation and Space Communications.
 - Exploration missions, Soyuz, Commercial crew, International Space Station (ISS) and Visiting vehicles (Soyuz, SpaceX, Boeing, Sierra Nevada)



NASA Networks Span the Globe



Commercial Market Opportunity

- ❑ In the 1980s the commercial space communications market was in its early stages...
- ❑ Today, private and public space sector activities are flourishing; existing commercial services exist to serve customers located on or close to Earth
- ❑ Creates an opportunity for NASA to develop a near-Earth service portfolio with multiple vendors
 - Robust and flexible architecture for the user community; not reliant on a single vendor
 - Contribute to market stimulation and growth
 - Savings in infrastructure, ongoing operations, and maintenance costs to NASA
- ❑ Pursue commercial services in accordance with the market:
 - Direct-to-Earth service is an established commercial market with multiple vendors
 - Space-Based Relay service for space users is an emerging market
- ❑ Obtaining services through commercial providers allows NASA to focus on the domains and technologies where commercial services do not yet exist
 - Expect NASA continued investment in infrastructure to support missions to the Moon, Mars and other destinations



LEAFSPACE



**Vibrant Commercial Ground
Station Market *Already Exists***

Spectrum Access & Authorization

- ❑ All NASA missions that require the use of the electromagnetic spectrum shall follow the U.S. spectrum regulatory rules/processes as referenced in NASA spectrum policy
 - NPD 2570.5: Sets forth NASA policy and responsibilities for obtaining approval for the use of the spectrum for any NASA mission, project, or other activity
 - NPR 2570.1: NASA Spectrum Management Manual provides guidance on the use of radio frequency (RF) spectrum
 - Spectrum Guidance for NASA Small Satellite Missions, although targeted for smallsats, provides useful information applicable to all space missions
 - See: www.nasa.gov/directorates/heo/scan/spectrum/policy_and_guidance.html
- ❑ All missions/projects using RF spectrum must be certified/authorized by the appropriate regulatory authority
 - For missions under effective control of NASA, NASA/Spectrum is responsible for securing spectrum certification/authorization from the federal regulator (NTIA)
 - Missions must provide the necessary information for preparing the certification and authorization submissions
- ❑ All missions should contact their associated Center Spectrum Manager (NASA/Center-led missions) as early as possible
 - Any project with no clear NASA Center lead may contact NASA National Spectrum Manager: John Zuzek (NASA/GRC) john.e.zuzek@nasa.gov

Mission Cloud Platform (MCP)

- ❑ Mission Cloud Platform (MCP) provides a consolidated cloud service within NASA in collaboration with Amazon Web Services (AWS), giving mission customers a streamlined process for implementing and using secure, compliant cloud resources. MCP supports NASA organizations requiring FISMA Moderate or Low (FISMA High anticipated FY21) environments in AWS GovCloud regions as well as AWS commercial regions.
- ❑ The Mission Cloud Platform provides access to commercial cloud services from AWS, for science processing pipelines and engineering support for cloud including:
 - FISMA Moderate authorization
 - ITAR/EAR in AWS GovCloud regions
 - Integration with NASCOM for mission network requirements
 - Integrated with Near Space Network (NSN) ground stations
- ❑ Contact:
 - Joe Foster, GSFC Cloud Computing Program Manager
 - Phone: (301) 286-2952
 - POC Email: joseph.l.foster@nasa.gov
 - New Account Request Mailbox: AGCY-MissionCloud@mail.nasa.gov

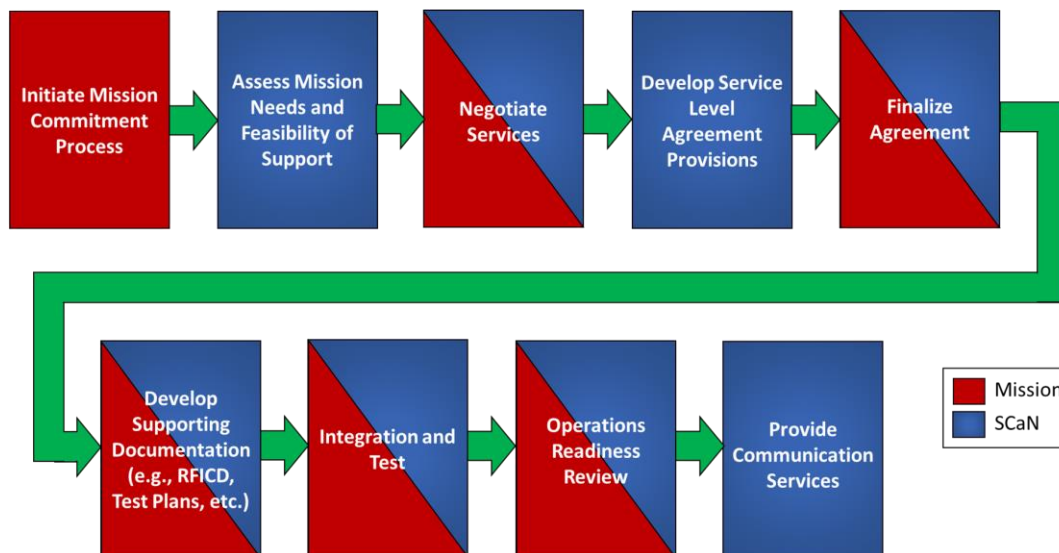
SCaN's Support to NASA's AO Process

- ❑ SCaN supports NASA's AO process by
 - providing documentation outlining SCaN's services, and the cost of using those services, intended to assist in the preparation of proposals, to be released with the AO (e.g. Space Communications and Navigation (SCaN) Mission Operations and Communications Services (MOCS) Document)
 - interacting with proposers as early in their development process as possible to begin pre-mission planning and analysis activities
 - assisting user missions with procuring services from other non-SCaN network entities and partners, including but not limited to other NASA organizations, other government agencies and international and commercial partners
- ❑ It is the responsibility of SCaN's Mission Commitment Office (MCO), along with the Commercialization, Innovation, and Synergies (CIS) Office and the Customer Interface Management Office (CIMO) to facilitate this process on behalf of the SCaN Networks.

SCaN's Mission Commitment Process

- ❑ SCaN utilizes an established process to capture and assess user requirements in order to determine how to best support those requirements.
- ❑ The process is collaborative and relies on communication and exchange of information between the customer and SCaN throughout all phases of mission development.
- ❑ The first step in this process is for proposers to fill out the SCaN questionnaire and submit it to SCaN. This initiates the Mission Commitment Process.

- ❑ The mission commitment process consists of multiple activities that, at the highest level, include:
 - Determination of viability to receive SCaN services
 - Dissemination of requirements
 - Feasibility assessments
 - Negotiation and development of service agreements
 - Brokering of support with partner agencies
 - Documentation support
 - Integration, verification, validation, and compatibility test activities
 - End-to-end test activities
 - Service provision



SCaN Points of Contact

- ❑ SCaN Program Office/NASA HQ
 - John Hudiburg/SCaN Mission Integration & Commitments Manager
 - john.j.hudiburg@nasa.gov
 - (202) 358-1202

- ❑ GSFC Near Space Network
 - Commercialization, Innovation, and Synergies Office
 - gsfc-missiononboarding@mail.nasa.gov

- ❑ JPL/ Deep Space Network
 - Glen Elliott / Mission Support Definitions and Commitments Office Manager
 - Glen.Elliott@jpl.nasa.gov
 - (818) 393-6373

A large NASA radio telescope dish is silhouetted against a dramatic sunset sky. The sun is low on the horizon, casting a warm glow over the scene. The telescope's structure is intricate, with a large parabolic dish supported by a complex metal framework. In the background, there are other smaller antennas and structures, suggesting a radio astronomy facility. The sky is filled with scattered clouds, some of which are illuminated by the setting sun.

NASA

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Space Communications and Navigation

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Keeping the Universe Connected