NSF TIP Space Portfolio Examples

Communications & satellites:
Swarm
Unspace
US Air Tech
Uninet
Care Weather
TF Wireless

PNT:
Chascii
Xona Space Systems
StarNav

Sensing
Urban Sky
ARSI
Astrabeam

Space debris:
Guardiansat
Spake Rake

Transport:
Stoke Space
Vortex Space Systems
Raven Space Systems
Fenix

Engines:
Rocket Propulsion Systems

Fusion:
Avalanche
NearStar
Tibbar Plasma

Energy & efficiency:
Magma Space
Nu Planet
Torre Space & Power Systems

Resources:
Interlune
Astroforge
Off-World
TPL
Off Planet Research
Lunar Resources
Outward Tech.

CO2 Conversion
Air Company

Recycling
Ascend Elements*
Lunexus Space

Directed Energy
Epirus

Propulsion:
Howe Industries
Morningbird Corp.
Viridina Space Corp
Hoverr

In Space Manufacturing:
NDF

Semiconductors:
United Semiconductors
Direct Kinetic Solutions

Bio:
Space Tango
Rhodium Scientific
Zaiput Flow Tech.
Nu Planet
Meati*

Data/AI:
AI Acuity

Docking
Orbital Services Corp.
Innotech Systems

Equipment
Magma Space
Space Kinetic

Space Internet & Cyber:
Forward Edge AI

Gravity
Radiant Space Systems
AnyGLabs

* *Terrestrial focus with applicability to space*

NSF TIP Space portfolio across CHIPs tech

Communications
Swarm
Unspace
US Air Tech
Uninet
Care Weather
TF Wireless
Chascii
Xona Space Systems
StarNav

Advanced Materials
Interlune
Ascend Elements*
Astroforge
Off-World
TPL
Off Planet Research
Lunar Resources
Outward Tech.

Adv. Manufacturing
Stoke Space
Vortex Space Systems
Raven Space Systems
Fenix
Rocket Propulsion Systems
Magma Space
Space Kinetic
AnyGLabs
Radiant Space Labs
Lunexus Space

Disaster Risk Resilience, Comms, Sensing
Urban Sky
ARSI
Guardiansat
Spake Rake

Artificial Intelligence
Epirus
AI Acuity

Semiconductors & Advanced Computing:
United Semiconductors
Direct Kinetic Solutions

Cybersecurity:
Forward Edge AI
NDF (National DigiFoundry)

Bio:
Space Tango
Rhodium Scientific
Zaiput Flow Tech.
Nu Planet
Meati*

Energy[1]:

Fusion:
Avalanche
NearStar
Tibbar Plasma

Energy & efficiency:
Orbital Services Corp.
Magma Space
Nu Planet
Torre Space & Power Systems
Innotech

Propulsion:
Howe Industries
Morningbird Corp.
Viridina Space Corp
Hoverr

Conversions (H, CO_2)
Air Company*
Syzygy Plasmonics*
FC Renew

* *Terrestrial focus with applicability to space, Energy examples; NSF has funded several hundred energy start-ups; many with capabilities applicable to space; these are just a few examples. Contact PD Anna Brady-Estevez*

Convergent TIP Space portfolio across CHIPs tech

Digital Health:
Aidhar Health

Solar:
Leap Photovoltaics

Energy Storage:
Ascend Elements
Belmont Scientific

Bio, biomanufacturing and agriculture:
Meati
Allied Microbiota
Modular Genetics
Acatechol

Sensing
Max-IR Labs
Coastal Ocean Vision

Artificial Intelligence
Epirus

Cybersecurity:
NDF
Forward Edge AI

Fusion & Plasma:
Avalanche
NearStar
Tibbar Plasma
Nano-Product Engineering

Hydrogen & Conversions:
Syzygy Plasmonics
Air Company
FC Renew
Avium

Conversions (H, CO_2)
Air Company*

Accelerating Space Economy: “More Shots on Goal”

NSF, NASA, ISS and other agencies (e.g. DARPA, Air Force) have funded higher throughput approaches

Innovating a national level acceleration model in space:

- Exceptional opportunities for advantage and benefits across CHIPs and science technology (biotechnology, semiconductors, energy, communications…).
- Opportunity to prioritize highest potential impact commercially focused R&D
- Potential for more wins and impacts faster, by developing more in parallel, data sharing and information
    - Hundreds of entities interested in space commercialization and R&D
    - Need to incorporate diverse and rich skills from other terrestrial areas of expertise (AI, robotics, advanced materials, bio, energy…). Building “plug and play” ramps into space R&D (without in-depth space expertise)
- Ability to amplify through AI, data sharing and fast iteration
- Make the most of limited assets (space and time constrained)
    - LEO platforms (such as ISS) are constrained (container sized modules), so enhanced prioritization and speed of throughput enable us to make the most of the valuable microgravity environment
    - Expansion of what is possible in a given space/time expected to be even more important on Mars (& Moon potentially)
- Opportunity for enhanced capital formation and tools to facilitate build out

Launch Cadence:

Stoke Space

Building towards rocket reusability and daily access

Rocket Propulsion Systems

Lower cost engines and capsule cost that are customizable and rapidly scalable for manufacturing

Communications:

Swarm (SpaceX acquired)

Cube satellite swarms enabling higher connectivity, expanding global internet access

Flawless Photonics*

Higher throughput production of ZBLAN fiber in-space (kms), potential for repeaterless undersea cables

Biotechnology:

Rhodium Scientific

Building an in-space biobank to increase access and usability

Space Tango

Expansion of cryovial biology throughput to many hundreds per unit

Semiconductors:

United Semiconductors

Building microgravity equipment to accelerate many semiconductors in parallel

Miniaturization:

Matiq

Ability to screen orders of magnitude higher materials

AI/Data & Cyber

NDF

Consortium working group focused on high throughput in-space manufacturing

ForwardEdge AI

Cybersecurity for data sharing across in-space assets, enabling higher levels of exchange