One AFRL - Two Services

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Commander's Intent and Priorities

1. Accelerate S&T 2030 Strategy Implementation
2. One AFRL, Two Services
3. Lead the Best Air Force Research Lab Team
Supporting the USSF in word and deed
Space is critical today for the U.S. economy and national security.

Remote sensing – communication, banking

India tests anti-satellite weapon, 2019

1969
~1500 objects, ~7 nations in space

Today
~10^4 objects; human-operated, ~90 nations; commercial

Russia and China have weaponized space

Future exploration

Economic Drivers

Space is critical for future exploration and utilization opportunities.

Russia and China have weaponized space
Space as Part of U.S. Strategy

**DESIRED CONDITIONS**
The space domain is secure, stable, and accessible. The use of space by the United States and our allies and partners is underpinned by sustained, comprehensive U.S. military strength. The United States is able to leverage our use of space to generate, project, and employ power across all domains throughout the spectrum of conflict.

**CENTRAL CHALLENGE**
The U.S. defense space enterprise was not built for the current strategic environment. The intentions and advancements of potential adversaries in space are threatening the ability of the United States to deter aggression, to protect U.S. national interest, and to fight and win future conflicts.

**SPACEPOWER**
The sum of a nation’s capabilities to leverage space for diplomatic, information, military and economic activities in peace or war in order to attain national objectives.

Military spacepower cannot unilaterally win wars, but like landpower, seapower, airpower, or cyberpower, its success, absence, or failure could prove catastrophically decisive in war.
Space is not new to AFRL

1960
- Release “Olive”
  - Explored ICBM motor and upper atmosphere interactions

1980s
- COPE
  - Coordinated Observations of Polar Electrodynamics

1992-1996
- MSTI-1, 2, 3
  - Miniature Sensor Technology Integration program

1998, 2000
- MightySat-1,2
  - Small satellite technology testing program

2003, 2005
- XSS-10, XSS-11
  - eXperimental Small Satellite

2006, 2009
- TacSats 2 & 3
  - Tactical Imager/Tactical Comm, Hyperspectral Imager/Tactical Comm

2012
- MOSC
  - Metal Oxide Space Clouds

2015
- GEARS, GEARS2
  - Cubesats testing commercial SatComm connections

2015
- ANGELS
  - Autonomous Nanosatellite Guardian for Evaluating Local Space

2015
- EAGLE/Mycroft
  - Missile warning, SSA, Protection/GEO, SSA 4th Gen InspectorSat

2017
- ROSA
  - Rollout Solar Array on the International Space Station

2020
- NTS-3
  - First Space Vanguard

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Enabling Space Integration
Multi-domain Tech Transitions

Unified Data Library

Open marketplace for Space Situational Awareness data providers to connect with Space Situational Awareness data users, analysts, or tool developers

Data providers control their data and who can access it

Millions of obs flowing daily from dozens of providers
AFRL is on the forefront of space technology

- NAVIGATION TECHNOLOGY SATELLITE – 3 (NTS-3)
- ADVANCED SPACECRAFT ENERGETIC NON-TOXIC (ASCENT) PROPELLANT
- SPACE POWER BEAMING
- DEMONSTRATION AND SCIENCE EXPERIMENTS (DSX) SATELLITE
- QUANTUM SENSING AND TIMING
- SMALL SATS AND HYBRID ARCHITECTURES
- SPACE LOGISTICS AND ADVANCED ROBOTICS
- SPACE DOMAIN AWARENESS

AFRL is on the forefront of space technology.
AFRL Space Technology Facilities

**Battlespace Environment Laboratory**
- Cold Atom Lab
- Imaging Spectroscopy Calibration Lab
- Plasma Chemistry Lab

**Existing Facilities – 55 Bldgs**
- 402,000 Sq Ft – Kirtland AFB, NM
- 3 new buildings under construction

**Spacecraft Technology Facility**
- Composite Fabrication and Testing Capabilities
- Unique Test Equipment
- Resilient Bus Experiment Lab (REBEL)

**Aerospace Engineering Facility**
- Gryphon Lab
- SmallSat Integration

**New Research Facilities**
- Deployable Structures Experiments Lab (DeSEL)
- Space Vehicle Component Lab

**AFRL NM Tech Engagement**
- AFRL New Mexico @ Q Station

**IRREL**
- Characterizes Focal Plane Arrays
- Nuclear Radiation Simulation Lab
- Mobile Characterization

**EO/IR Facilities**
- Space Electronics

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AFRL Space Technology Facilities

Starfire Optical Range

- Providing SDA tech to the community

Satellite Assessment Center
- Assessing vulnerability to protect satellites

AMOS – Air Force Maui Optical and Supercomputing Site

- Developing laser guidestar, adaptive optics
AFRL Space Propulsion Facilities

- National Asset for US & Industry
- 65 sq miles
- $10.2B in infrastructure
- Dual Use facilities

**Experimental Test Cells**
- Chemistry & Propellant Labs

**Altitude and Space Environment Simulation Facilities**
- Micro-newtons $\rightarrow$ 50,000 lbs thrust

**High Thrust Facilities**
- 19 Liquid engine stands, up to 8,000,000 lbs thrust
- 13 Solid Rocket Motor pads, up to 10,000,000 lbs thrust
One AFRL = Depth and Breadth of Entire AFRL Team

**TYPES OF EMPLOYEES**

- **1,200** Military (USAF/USSF)
- **5,100** Civilians
- **4,700** Contracted Positions

**SCIENTISTS & ENGINEERS (S&Es)**

- Three out of every five government civilians are S&Es

**EDUCATION**

- 70% of S&Es hold a Master’s degree or higher
- 36% hold a Ph.D.

**BUSINESS PROFESSIONALS**

- Program Management, Finance, Contracting, Acquisition, Security, Information Technology, and many more...

**Extensive Diversity and Inclusion Outreach Initiatives**

**700+ billets to space: access to entire AFRL team**
-existing science & technology (s&t) ecosystem
Emphasizing the path for space-focused science and technology programs

- Determining Space S&T needs and priorities
- Developing and Maintaining Space S&T strategic Plan
- Providing direction and oversight of the Space S&T portfolio across executing organizations
- Developing the Space S&T element of the USSF POM
- Interacting, coordinating, collaborating, and partnering across the larger Space S&T community within the DoD, industry, private sector, other government agencies, and international

TEO and Deputy TEO for Space - Focal Points for USSF S&T Execution

TEO
Brigadier General Heather Pringle

Deputy TEO for Space
Dr. Kelly Hammett
Underlying Tenets for **One AFRL – Two Services**

- Today’s threat require multi-disciplinary solutions
- Cross-discipline collaboration enhances outcome
- AFRL has deep, strong space history expertise
- Eliminates duplication and reduces overhead to optimize and stretch limited research funding
- Leverage shared lab facilities, test assets, tools
- Enables robust, multi-domain Digital Enterprise
- Established Deputy TEO for dedicated support
- Efficient, agile, and collaborative engagement

**Best return on investment for limited Department of the Air Force resources**
Questions?