Moon, Mars, & Beyond

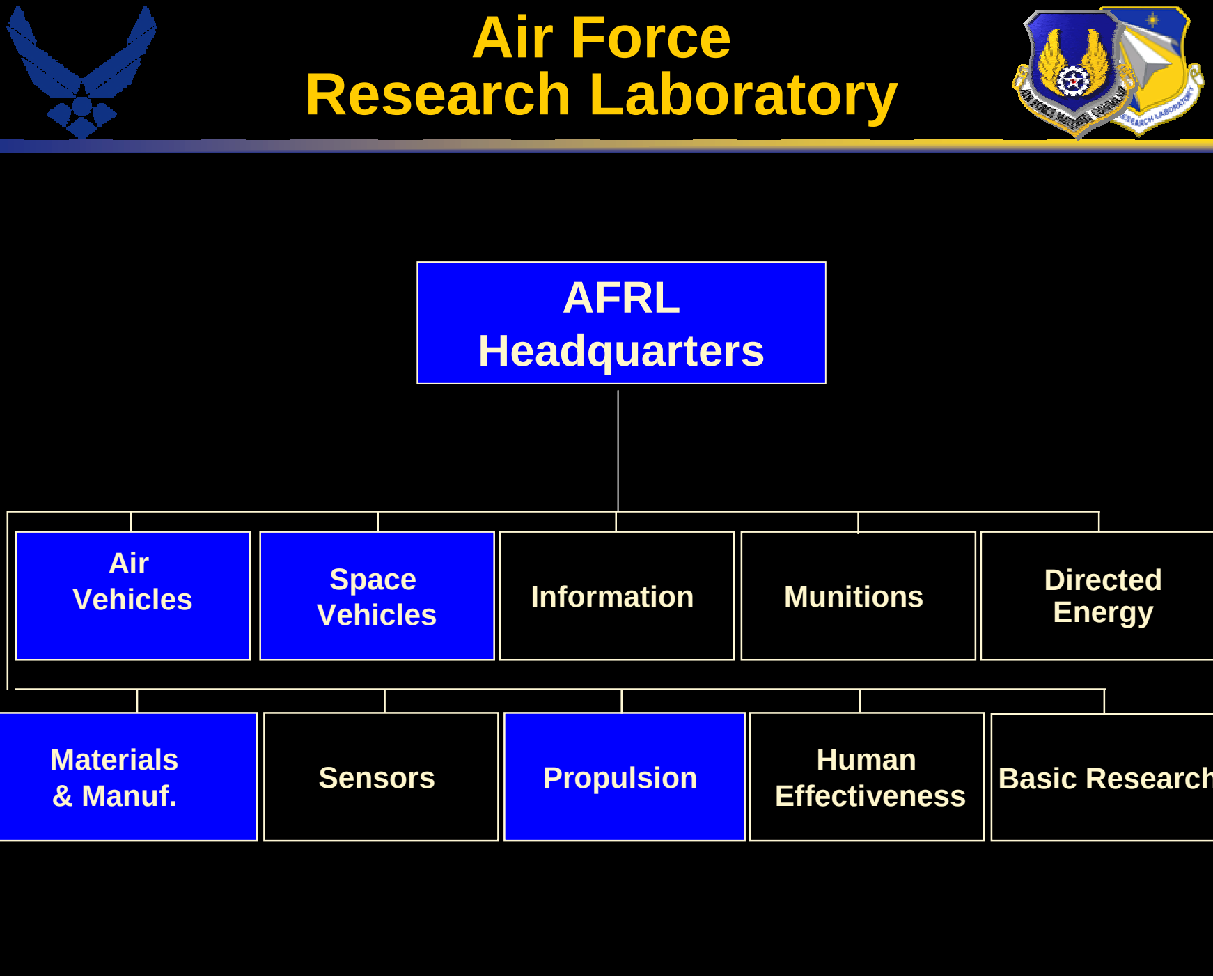
4 Mar 04

Maj Gen Paul D. Nielsen
Commander
Air Force Research Laboratory

Agenda

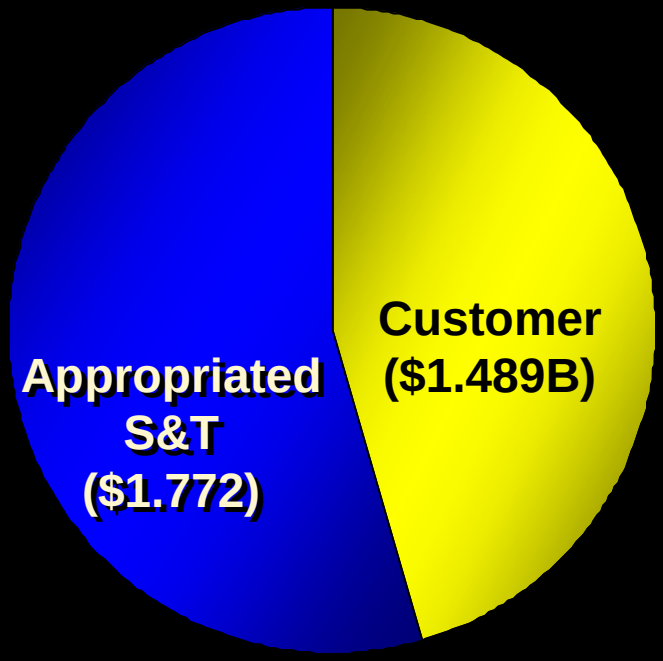
- Leader in Space Research
- Strong Partnerships
- S&E Workforce

Air Force Research Laboratory



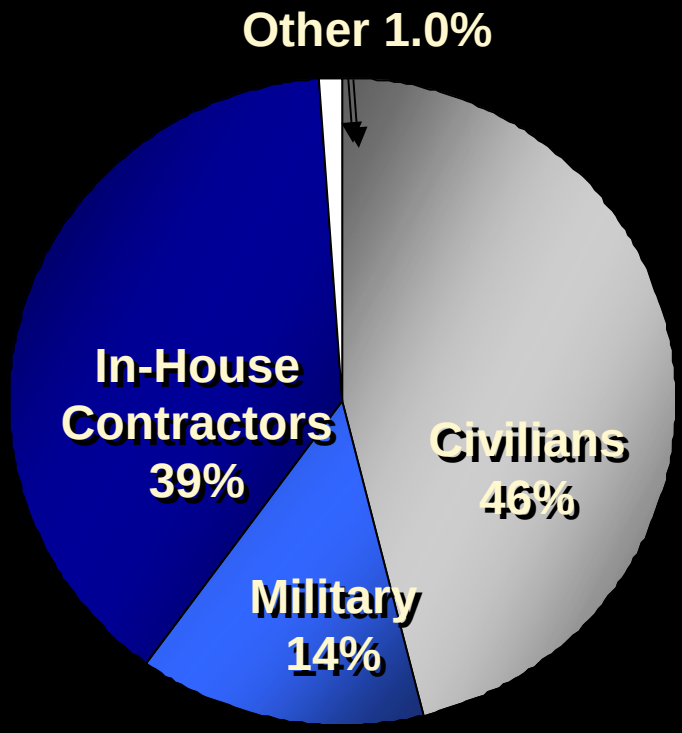
AFRL Resources (FY04)

Revenue



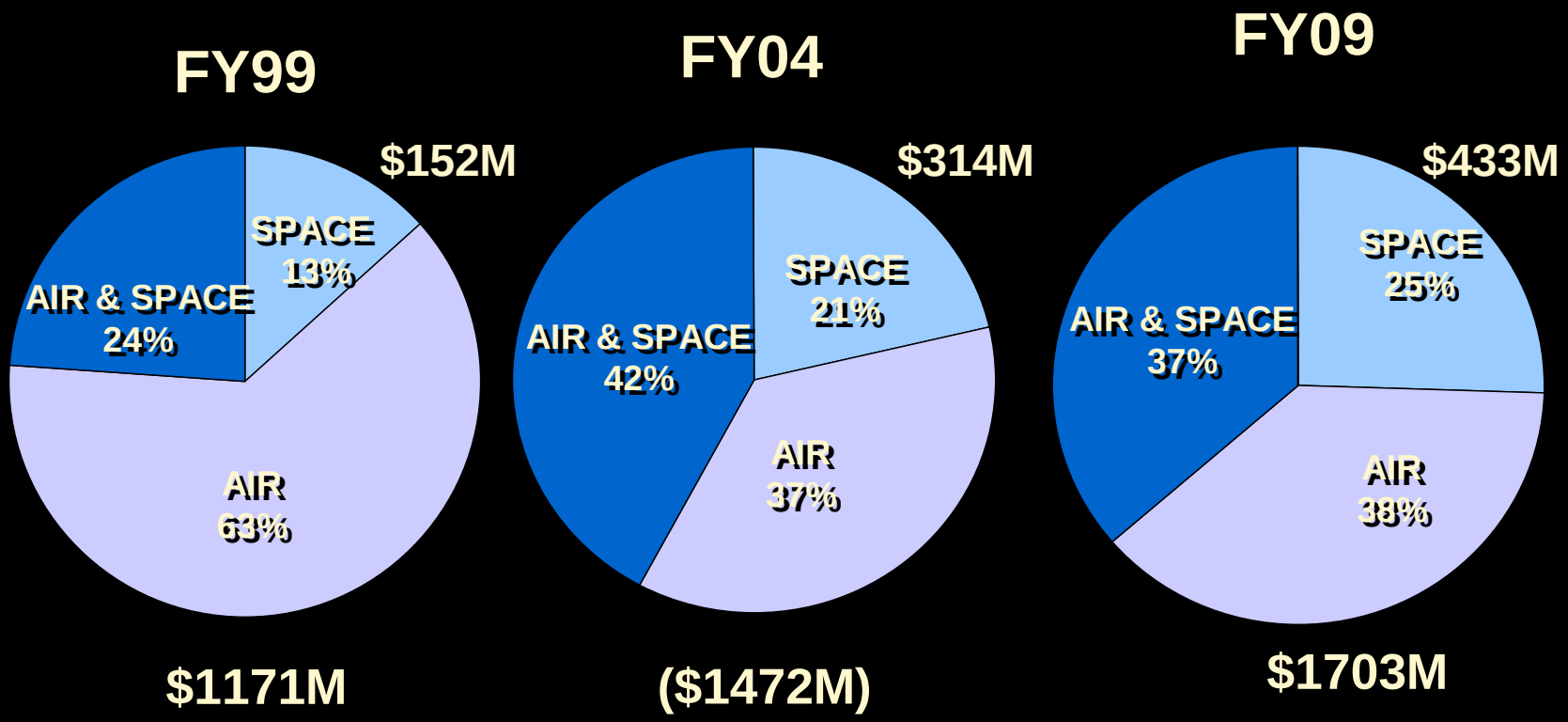
$3.4 Billion

Manpower



5227 Govt (Mil/Civ)
3450 Non-Govt (Cont/IPA)

AFRL Space Investment Migration



AFRL Space Technologies

Propulsion/Propellants

Manufacturing Technology Programs

Space-Based Radar

Power

Electro-Optic Sensors

Communications

Signal Processors

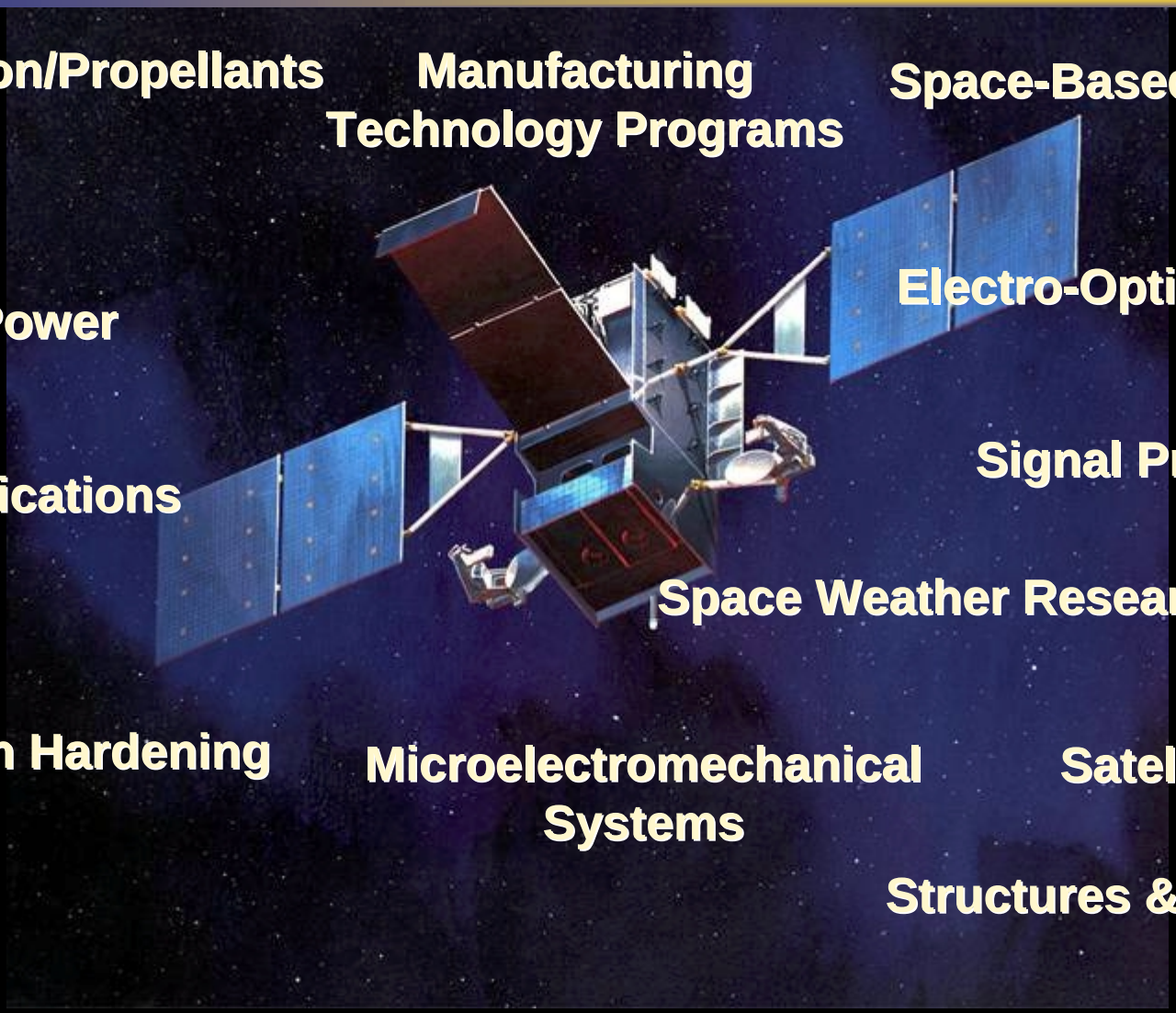
Space Weather Research

Radiation Hardening

Microelectromechanical Systems

Satellites

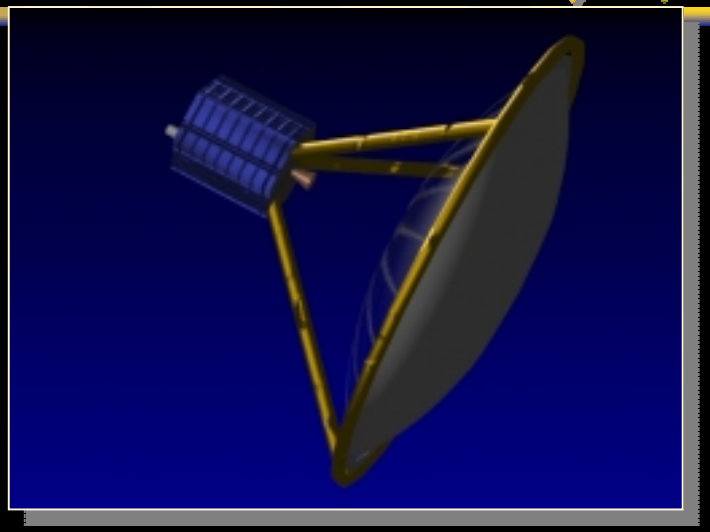
Structures & Materials



Space Partnerships

- NASA
- International
- Naval Research Laboratory
- NRO
- DTRA
- JPL
- DARPA
- Space Technology Alliance
- IHPTET/VAATE/IHPRPT

AFRL – NASA Partnership Examples



- JPL
  - New Millennium Program
  - Next Generation Processor
  - Micro-satellites
  - Large Precision Structures
- Glenn
  - Space Power
- Ames
  - Wind Tunnel Testing

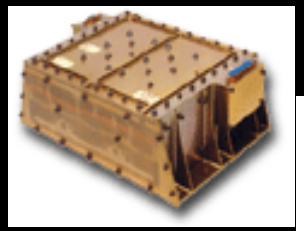
- Goddard
  - Cryocoolers and Detectors
  - Autonomous Constellation Maintenance
  - Deployable Optical Imaging
- Marshall
  - Space X-Vehicle; RLV Technologies
- Langley
  - Space Structures
  - Hypersonics

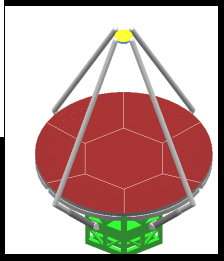
Space Technology Alliance

- Multi-agency government consortium, established 1997
- Members meet approximately every 6 to 8 weeks to discuss areas of common interest

CURRENT WORKING GROUPS

- Space Environmental Effects
- Large Space Optics
- Space Laser and Optic Technology
- Space Power



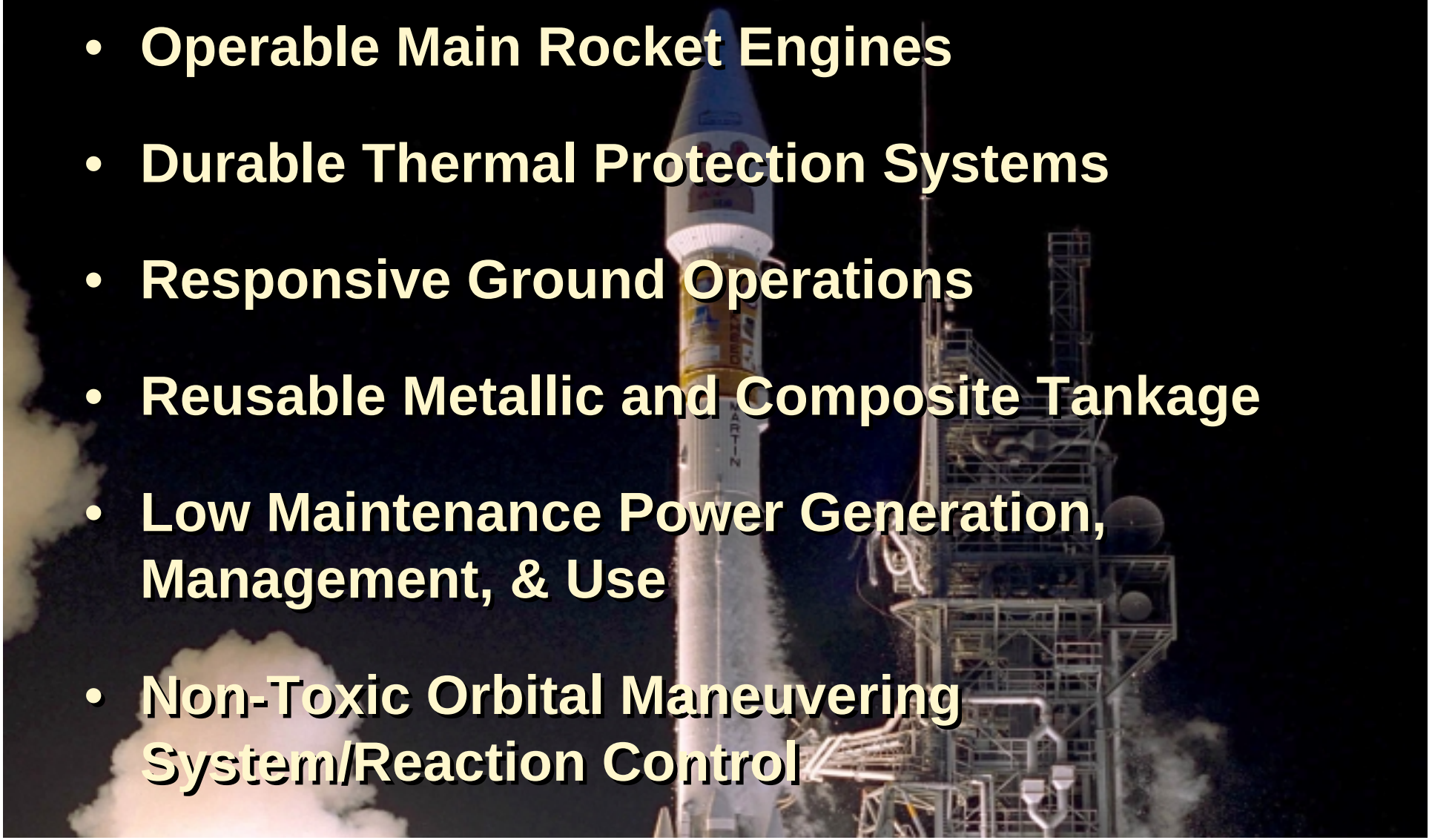


Shared Database … Coordinated Roadmaps … Joint Programs

AFRL - NASA Mutual Interests

- Active & Passive Sensors
- Cryocoolers
- Data Fusion
- Interferometry
- Large Deployable Optics
- Materials Research
- Microsatellites
- Mission & Spacecraft Design
- Navigation & Orbit Determination
- Optical Systems
- Radiation-Hardened Microelectronics
- Robotics & Autonomous Systems
- Space Contaminants
- Space Propulsion
- Space Power
- Sparse Optics/Antenna Arrays
- Synthetic Aperture Radar
- Systems Engineering & Test
- Thermal Control
- Space Weather

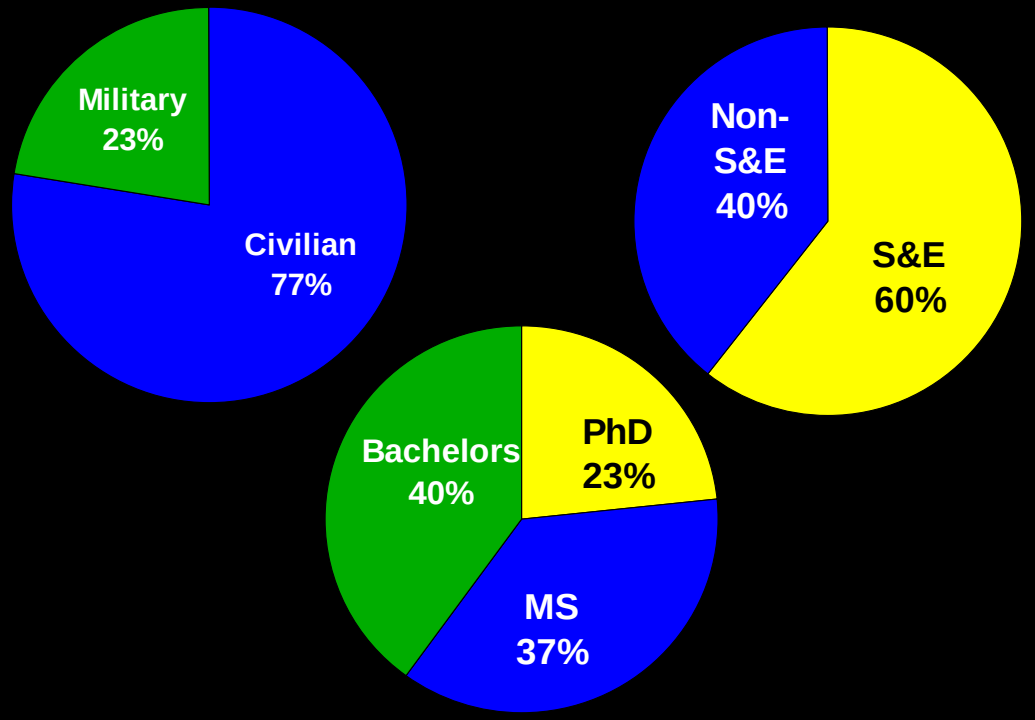
NASA Space Access Investments Important to the Air Force



- Operable Main Rocket Engines
- Durable Thermal Protection Systems
- Responsive Ground Operations
- Reusable Metallic and Composite Tankage
- Low Maintenance Power Generation, Management, & Use
- Non-Toxic Orbital Maneuvering System/Reaction Control

S&E Workforce

- Concerns
- Supply
- Outreach



AFRL Workforce Composition

Closing Thoughts