Leading the discovery, development, and integration of affordable warfighting technologies for our air, space, and cyberspace force.
AFRL Technology Focus Areas

C2 / ISR & Cyber
- Ground SSA
- Space Comm
- Cyber

Electronic Warfare / Electronic Protection
- EW Plus
- Distributed EW
- IR countermeasures

Affordability & Sustainment
- MANTECH
- Sustainment
- Energy/Fuels

Human Performance
- Autonomy
- Aerospace Physiology

Command & Control/Intelligence, Surveillance, and Reconnaissance (C2/ISR)
ADaptive Versatile ENgine Technology (ADVENT)

**Goals**
- Improve fuel efficiency (+25%) through demonstration and maturation of adaptive turbine engine technologies that optimize performance over all flight conditions
- Increased power/thermal capacity enables 2x low altitude persistence
- 1.5B gal fuel savings through 2040
- OSD - accelerate maturation of competitive adaptive engine technologies

**Programs**
- Preliminary design of adaptive engine technology development
- Risk reduction of critical engine components
- Maturation of an engine core
- Sub- & full-scale ground rig & engine testing
- Engine integration
- Technology development and integration
- Analysis of uninstalled and installed engine performance
- Analysis of operational benefits

**Resources**

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5th and 6th Generation Weapons

Goals

- Increased Capability/Capacity; Future Threat-Aware Approach
- Highly Contested Airspace – Anti Access / Area Denial
- Optimizing 5th/4th Gen Mixed Capabilities
- GPS Degraded / Denied Environments
- Understand w/Warfighter the Value of Speed in all Airspace
- Sensors Forward Optimization for Targeting/Integrated Secure Comm
- DE /Non Kinetic Effects – Forward (NKE-F)
- Enhanced Lethality Warheads & Effects
- Cooperative Effects – Time Synched? Geo-Synched?

Programs

- High Velocity Penetrating Weapon
- Next Generation Missile
- Small, Advanced Capability Missile
- High Speed Strike Weapon
- Low Cost Mini Cruise Missile
- Anti-Jam Precision Guided Munition JCTD
- Cooperative Engagement, Networked Lethal UAVs
- Tactical and Strategic LASER weapons
- CHAMP

Resources

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Autonomy

Goals

- Develop UAS/RPA teaming technology for goal-directed behavior in contested environments
- Improve the man-machine interface to reduce operator/analyst fatigue, workload, and stress
- Transition sense-and-avoid (SAA) and automated aerial refueling (AAR) autonomy technology
- Flexibly set appropriate level of trust in autonomous systems to reduce error, increase confidence, and increase transparency
- Align with OSTP and ASD(R&E) Big Data Grand Challenge

Programs

- Teaming of Autonomous Systems (Collaborative Systems Control / Autonomy for Contested Environments)
- Human-to-Machine Teaming (Human Interaction w/ Adaptive Automation, Supervisory Control)
- Machine Perception, Reasoning and Intelligence (Adaptive Guidance & Control, Text Understanding)
- Testing and Evaluation, Verification and Validation (Hardware in-the-loop Test Tech, Autonomous Sys V&V)

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Machines seamlessly integrated with humans – AFRL Technology augmenting humans where needed, replacing humans where desired
**Goals**

- Predict & Mitigate environmental effects on space-based missions
- Forecast space impacts on Communications and Navigation Sys
- High performance and radiation hardened space electronics
- Ground- and space-based space situational awareness, including close proximity
- Lower space platform & operations costs

**Programs**

- M&S for space weather forecasting, space hazard tracking, on-orbit flight planning and space vehicle design
- Advanced technologies for PNT
- New sensors, electronics and materials for the extreme environment
- Advanced Inertial Measurement Unit development for increased reliability
- ANGELS, STP-2, and EAGLE flight experiments

**Resources**

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Legacy of War-Winning Technology Development