

### AFRL Missile Utility Transformation via Articulated Nose Technology (MUTANT)



Learn how the AFRL MUTANT program is developing technologies to increase missile range and lethality against highly maneuverable targets with a better flight control actuation system. The MUTANT program employs a form of active morphing involving high-rate pivoting of the missile forebody, referred to as articulation. [Read More](#)

### AFRL supports NASA's Artemis program



Check out how the Air Force Research Laboratory and NASA worked together in April 2023 with other industry partners, such as Lockheed Martin, to test the next replica of a seat and suit that will be used for the next mission to space in the Orion. [Watch Here](#)

### Lab Life - Episode 74 – Hot Topics in Ceramics



Dr. Matthew Dickerson and Dr. Lisa Rueschhoff of the Materials and Manufacturing Directorate (RX) are the featured guests on episode 74 of AFRL's "Lab Life" Podcast. "Lab Life" brings listeners behind the scenes with scientists, engineers, professionals and the technologies developing tomorrow's technology today. [Listen Here](#)

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## TOP NEWS STORY ▾

# AFRL HELPS NASA TEST EQUIPMENT FOR ARTEMIS II MISSION

**WPAFB, OH** — The Air Force Research Laboratory, or AFRL, and NASA worked together over the last two weeks of April 2023 along with other industry partners, such as Lockheed Martin, to test the most current iteration of an astronaut crew seat and flight suit that will be used in the Orion spacecraft during future missions to space. "NASA came to us actually several years ago, to work with them on development of the Orion spacecraft capsule [to test the] suit for the astronauts and the seating system with the emphasis on the structural design of the seat and the restraint configuration," said Chris Perry, senior biomedical engineer, Biodynamics Section, 711th Human Performance Wing. The Horizontal Impact Accelerator, or HIA, at AFRL's Biomedical Impact of Flight Branch,

tested multiple landing scenarios to gauge how the high-energy, low duration events inherent to the Orion spacecraft's landings might affect the crew of the Artemis II mission. Using only parachutes to reduce speed, the Orion crew module will slow from nearly 25,000 miles per hour to around 20 during reentry and splashdown in the Pacific Ocean. "This horizontal accelerator is currently the only known facility of its kind that can conduct extensive biodynamic research on instrumented [anthropometric test device, or] ATDs and volunteer human subjects," Perry said. [Full Story](#)



## PEOPLE OF AFRL



Participants attend the University Tech Collider Working Group at the Rotunda at Science and Technology Park in Albuquerque, New Mexico, April 13, 2023. The event aimed to develop and improve knowledge of career opportunities for University of Arizona students, advance technological development in the state of Arizona and expand science, technology, engineering and math education outreach initiatives throughout the Arizona educational system. (U.S. Air Force photo) The Air Force Research Laboratory, or AFRL, held the University Tech Collider Working Group at the Rotunda at Science and Technology Park in Albuquerque, New Mexico, April 13-14, 2023. The event was hosted in partnership with New Mexico Tech, the Southwest Innovation Alliance and the University of Arizona. [Read More](#)

### AFRL CONDUCTS SWARM TECHNOLOGY DEMONSTRATION

**KAFB, NM** — The Air Force Research Laboratory, or AFRL, conducted a demonstration, April 5, 2023, of its high-power microwave counter drone weapon, the Tactical High-power Operational Responder, or THOR, as it engaged a swarm of multiple targets at the Chestnut Test Site, Kirtland Air Force Base. "The THOR team flew numerous drones at the THOR system to simulate a real-world swarm attack," said Adrian Lucero, THOR program manager at AFRL's Directed Energy Directorate. "THOR has never been tested against these types of drones before, but this did not stop the system from dropping the targets out of the sky with its non-kinetic, speed-of-light High-Power Microwave, or HPM pulses," he said. Capt. Eric Plummer, a test engineer with AFRL's Directed Energy Directorate, operated the THOR system and has been



with the THOR program for nearly two years. He was responsible for aiming the THOR system at the swarm. "THOR was exceptionally effective at disabling the swarm with its wide beam, high peak powers and fast-moving gimbal to track and disable the targets," said Lucero. As the dangers from drone swarms evolve, leaders from across the Department of Defense are working closely to ensure we are exploring different technologies like directed energy to support the needs of the warfighter in the future against such threats. [Full Story](#)

### AFRL QUANTUM RESEARCH ADVANCES 3C CAPABILITIES IN FUTURE AIR, SPACE AND CYBER OPERATIONS

**ROME, N.Y.** — The Air Force Research Laboratory or AFRL, is always looking for new ways to stay ahead of the competition; quantum is no exception. Quantum has many areas to explore, from sensing to computing, all using principles of quantum mechanics to process data. It is a relatively new technology in terms of application, but its promises for future capabilities are of great interest to the Air Force. "I tell people I shoot lasers at atoms to make them do interesting things," said Dr. Kathy-Anne Soderberg, research physicist at AFRL's Information Directorate, in Rome, New York. "Just to clarify, shooting lasers at atoms does not mean we have Photon Torpedoes yet," referring to the sci-fi television series Star Trek. Dr. Soderberg and other scientists and researchers are advancing quantum technologies from the individual quantum bit or qubit, level to the system level, where



different qubit types must interface. This work is helping the U.S. military to accelerate quantum research and development as first adopters of connected ultra-secure quantum communication and move the ball forward for use. "Quantum states and hence qubits are extremely fragile and sensitive to external disturbances, making them the best sensors in the world," said Soderberg. [Full Story](#)