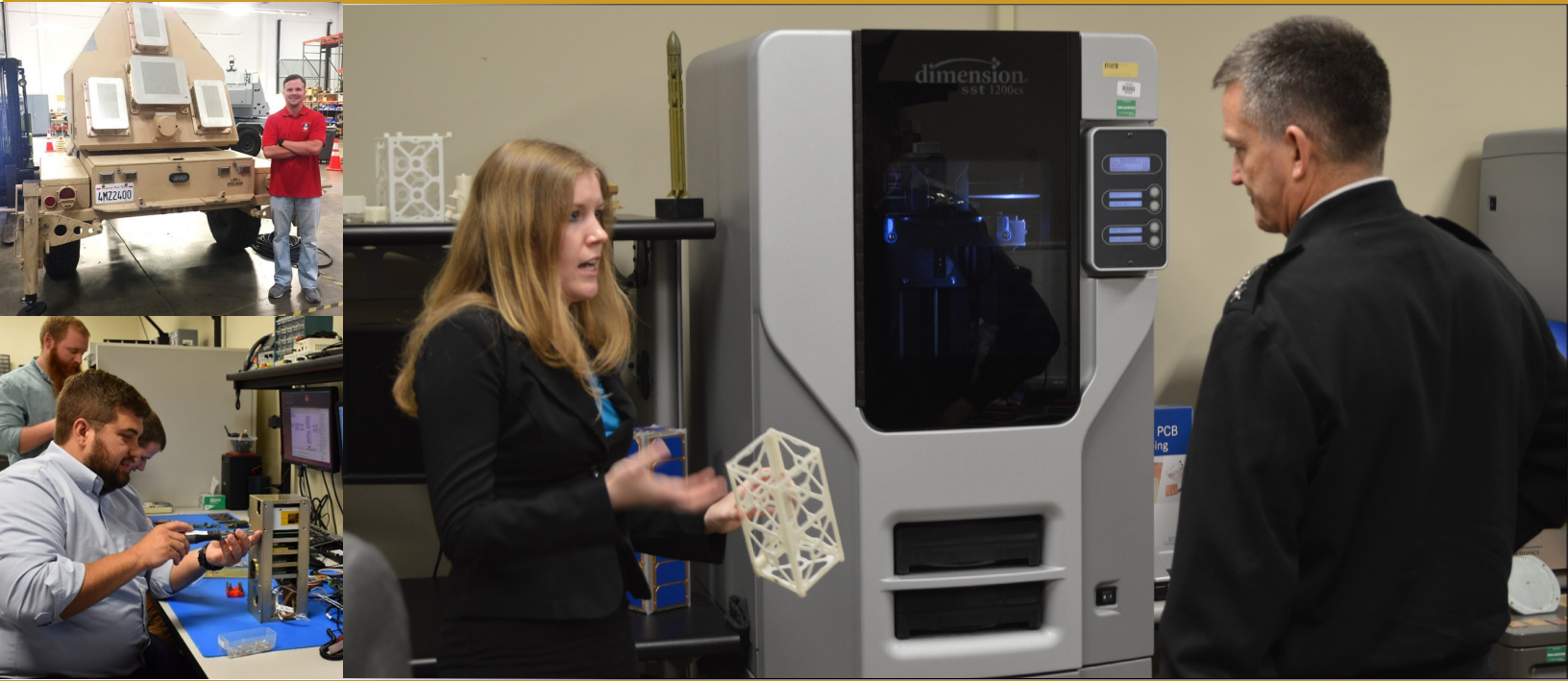




CONCEPTS ANALYSIS LABORATORY (CAL)



Performing research, advancing new technologies, and developing the science and technology leadership and workforce of the future

The Concepts Analysis Laboratory was established by the Technical Center in 2004 to provide an in-house, unique, hands-on environment for the Technical Center's newly hired engineers, scientists and college interns. The Concepts Analysis Laboratory develops new engineers and scientists by providing a state-of-the-art laboratory environment where interns can experience practical applications and develop skill sets needed for current and future U.S. Army Space and Missile Defense Command programs. The Concepts Analysis Laboratory exposes the interns to various types of engineering through assigned technical projects that support the Technical Center and other command programs. After their internship in the Concepts Analysis Laboratory is complete, the interns are transitioned to specific technology programs within the Technical Center's directorates to continue their technical growth.

- Supports small satellite programs through modeling and simulation, ground station development, ground station operations, antenna design, propulsion research, fabrication and testing
- In-house prototyping capabilities: SolidWorks, 3D printing, printed circuit boards
- Digital signal processing/field programmable gate arrays: software defined radio, radar signal processing
- Provides truth sensor support to the counter-rocket, artillery, and mortar/counter-unmanned aerial system programs
- Recruit, train and mentor students and young professionals to develop a cadre of technically competent professionals



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Concepts Analysis Laboratory employees provide support to the following efforts:

- Small satellites – modeling and simulation, ground station development, ground station operations, antenna design, propulsion research, fabrication and testing, and flat-sat testing
- Operation of truth sensor for counter-rocket, artillery and mortar, and counter-unmanned aerial system testing at Yuma Proving Ground, Arizona
- Image processing for future laser weapon systems
- In-house prototyping capabilities – SolidWorks, 3D printing, printed circuit boards
- Digital signal processing/field programmable gate arrays – software defined radio, radar signal processing

The Concepts Analysis Laboratory uses the Department of Defense's Science, Mathematics and Research for Transformation, or SMART, scholarship program and the Department of Army intern program to hire the best and brightest engineers and scientists from all over the country. Typically, the Concepts Analysis Laboratory has graduates/students from universities across the United States, such as the University of Michigan, Georgia Institute of Technology, Arizona State University, University of Alabama in Huntsville, University of Arizona, University of Central Florida, University of Alabama, Auburn University, Tuskegee University, and Utah State University.

The SMART program provides for all of the students' educational expenses to allow them to pursue a bachelor's degree, master's degree or PhD in one of the science, technology, engineering or mathematics areas. While in school, students in the program receive full tuition, a monthly stipend for living expenses, health insurance and book allowances, as well as an internship in the Concepts Analysis Laboratory during the summer that lasts from eight weeks to 12 weeks. When they graduate with their degree, scholars begin working in a permanent civilian position within the Technical Center.

Graduates are required to work at the U.S. Army Space and Missile Defense Command in Huntsville, Alabama, for a period at least equivalent to their SMART scholarship period. The SMART graduates and Department of the Army interns work in the Concepts Analysis Laboratory for approximately two years on multiple projects in different Technical Center mission areas such as small satellites, high energy lasers, radars, optics, etc. This exposure to multiple mission areas allows the engineer and Technical Center leadership to determine which division is the best fit for the engineer to



transition into permanently.

The Concepts Analysis Laboratory facilities include a hardware lab area with laboratory benches, multiple 3D printers, a circuit board mill and pick and place machine, cleanroom, satellite software in the loop and hardware in the loop testbed, collaborative office area and a large meeting/classroom with a state-of-the-art media wall.

With its unique mission and facilities, the Concepts Analysis Laboratory is normally a must-visit location for high profile visitors and regularly receives and briefs national, state and local political leaders, as well as senior military leaders from across the Department of Defense.

The Concepts Analysis Laboratory is also routinely asked to participate in outreach events such as Adventures in Engineering, Bring Your Child to Work Day and career days at area schools. The purpose of these outreach events is to encourage children to pursue degrees in the science, technology, engineering and mathematics areas to ensure that the U.S. has the leadership and workforce to meet the challenges of today and tomorrow.



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