

SPACE DOMAIN CENTER OF EXCELLENCE



West Point
READY 

READY TO SERVE. READY TO LEAD.



Cadet Nolan Pearce, F4 '22, Cadet in Charge Astronomy Club, prepares the high-altitude balloon for launch with members of the Astronomy Club. "I became the Astronomy Club CIC last year almost exclusively for high-altitude balloons. I have a research interest in satellite, expedient, and resilient communications, so I jump at the chance to actually launch payloads."



"How the U.S. develops the potential of space for civil, commercial, defense, and intelligence purposes will affect the nation's security for decades to come." (Congressional Space Commission) As the United States advances its capabilities in Multi-Domain Operations with increasing reliance on the Space Domain, West Point cadets and faculty must be on the cutting edge of our country's needs and the National Space Policy. Space is the final frontier and the ultimate high ground. The space race continues through technological development: global positioning, imaging, communications, warning systems, space defense and space offense. It is contested, congested, and competitive. The USMA of the 21st Century has the critical task of preparing future leaders—across all branches—to be space-enabled professionals who understand and can succeed in the face of the unique challenges these domains present. The expansion and modernization of West Point's Space Domain Center for Excellence (CFE) is an increasingly necessary component of cadet leader development for the benefit of the Army and the Department of Defense as a whole.

The new Space Domain CFE will include a planetarium, expanded telescope and antennae capability, and near full-time oversight of the facility and the amplified academic capabilities within it. It will provide cadets with outstanding hands-on opportunities—under expert faculty guidance and within real-world constraints—to apply mathematical and scientific

knowledge to identify, formulate, test, and solve problems beyond the atmosphere. Through increasing understanding with technologies and systems such as orbital mechanics, the space environment, attitude determination and control, satellite communications, space structures, astrophysics, space structure and physics, remote sensing, rocket propulsion, and more, the Space Domain CFE will help further the development of the space-enabled professional. Importantly, cadets will gain functional experience operating on multi-disciplinary teams—like those they will lead in the field—as they work to formulate, examine, and communicate the professional and ethical aspects of contemporary space issues and associated technology.

Unique to USMA cadets is the opportunity to gain experience with both real-world field testing and theory simultaneously. Unlike other universities, West Point's junior faculty and



graduates who return to USMA to teach are like portals into the operational army through which research/design and practical implementation can flow back and forth. Indeed, as LTC Will Koch, Academy Professor and Space Science Program Director,



Cadets in the SP472 (Space Physics) course travelled to visit the Lincoln Laboratory and Haystack Observatory in Massachusetts. They received briefings from space scientists at the laboratory and learned about the large 37-meter radio telescope and several radar systems used for ionospheric research. The trip was an opportunity to connect their course curriculum to active areas of research that contribute to our understanding of the space domain and national security.

notes, “when academic research has a direct military application, such as improving the radiation hardening on space-based military assets, we graduate Second Lieutenants who have recent experience pushing the envelope of the technical capabilities of the United States Army.”

The West Point Space Domain Center offers an enduring presence and exceptional capability to address the urgent needs of the growing Space Domain into the future. “Our goal is to develop space-minded leaders of character equipped with an understanding and appreciation of the fundamental scientific principles behind the space domain. Achieving this goal is essential—our graduates must be equipped to fight and win in ground combat through the integration of all warfighting domains,” says Koch.

As cadets leverage knowledge of the space environment, space capabilities, and space threats into the planning of all domains of battle—land, air, sea, cyber, and space—they will be a step ahead as unit leaders highly capable of operating in the multi-domain battlespace of tomorrow.



MAJ Challie Galliard, USAF, conducts a pre-launch inspection of the SPEAR rocket at the Spaceport America launch complex with a faculty member from the Department of Civil and Mechanical Engineering. The SPEAR team is a cadet-initiated multi-disciplinary effort to develop operationally responsive space capability to the Army.

“We have got to treat space as a warfighting domain. It is no longer just this medium that data and information pass through. First and foremost, we have to address the threat in that domain and what our adversaries are doing to contest us in space. We have to make sure space is integrated just like we integrate the air, the sea, the ground, and increasingly cyber and electromagnetic spectrum. We’ve got to make sure space is incorporated in our day-to-day operations as warfighters. Without Army space enablers our ability to shoot, move and communicate come at risk if we are not providing those capabilities to the warfighter.”

— LTG Daniel L. Karbler '87, commanding general, US Army Space and Missile Defense Command, during Joint All-Domain Command and Control and Space Mission Integration panel on November 18, 2020.



Photo: Lee Ross '73

FUNDING OPPORTUNITIES

Space Domain Center of Excellence	\$8.9 million
Observatory Naming	\$2.5 million
Research & Testing Initiatives	
Balloon Satellite Program	\$625,000 endowment/\$25,000 annual
Orbital Mechanics Program	\$625,000 endowment/\$25,000 annual
Altitude Determination & Control Program	\$625,000 endowment/\$25,000 annual
Satellite Communications Program	\$625,000 endowment/\$25,000 annual
Remote Sensing Program	\$625,000 endowment/\$25,000 annual
Space Structure & Physics Program	\$625,000 endowment/\$25,000 annual
Astrophysics Program	\$625,000 endowment/\$25,000 annual
Rocket Propulsion Program	\$625,000 endowment/\$25,000 annual
Academy Scholars Program (5 cadets)	\$625,000 endowment/\$25,000 annual
Academy Scholars Program (1 cadet)	\$125,000 endowment/\$5,000 annual
Capstone Projects Initiative (5 cadets)	\$625,000 endowment/\$25,000 annual
Capstone Projects Initiative (1 cadet)	\$125,000 endowment/\$5,000 annual
Cadet Research & Testing Travel	\$500,000 endowment/\$20,000 annual
Technical Instruments	\$250,000 endowment/\$10,000 annual

MARGIN OF EXCELLENCE



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