

AAMP-EM

ADVANCING ARMY MODERNIZATION PRIORITIES-
ENERGETICS MATERIALS

A key partnership between Purdue and the Army Research Lab is helping to maintain the military's superior technological capabilities and address readiness gaps that affect national security and defense.

Research related to energetic materials — explosives, propellants and pyrotechnics — is essential to the U.S. Department of Defense's modernization priorities.

The Advancing Army Modernization Priorities — Energetic Materials (AAMP-EM) Cooperative Agreement between the Purdue Energetics Research Center (PERC) and DEVCOM Army Research Laboratory (ARL) responds to this need with a comprehensive research agenda that targets every aspect of the U.S. energetic materials enterprise—from synthesizing molecules all the way to manufacturing munitions.

(ABOVE) High-speed infrared image of a hypergolic propellant. (Purdue University/P.V. Ramachandran)

45
**PURDUE FACULTY
AND STAFF**

39
**ARMY RESEARCH
LAB STAFF**

250+
STUDENTS
Postdocs, PhDs, graduate
and undergraduate

KEY RESEARCH FOCUS AREAS

- Synthesis and formulation of energetic materials
- Machine learning and computer modeling
- 3D printing and additive manufacturing
- Combustion
- Fuels and propellants
- Smart armor and blast effects
- Sustainability and lifecycle assessment
- Training and workforce development



(RIGHT) Static rocket fire test performed by Adranos, Inc. (Purdue University/Chad Kirkland)





AAMP-UP '23 students and mentors in front of the VOSS Model in Discovery Park at Purdue University.
(Purdue University/Dave Mason, ISPhotographic)

ADVANCING ARMY MODERNIZATION PRIORITIES UNDERGRADUATE PROGRAM

A key component of AAMP-EM is the Advancing Army Modernization Priorities — Undergraduate Program (AAMP-UP). AAMP-UP is an 11-week summer research program that provides an immersive, experiential environment for undergraduates to collaborate with energetic materials experts. The goal of the AAMP-UP program is to introduce students to energetics materials research and establish a “talent pipeline” for engineering graduate programs and national research laboratories.

One hundred and three undergraduate students from 25 colleges across the nation have completed the AAMP-UP program. Student majors ranged from aeronautics & astronautics to mechanical engineering and chemistry.

ABOUT THE PURDUE ENERGETICS RESEARCH CENTER (PERC)

PERC brings together researchers from across disciplines to focus on comprehensive energetics materials research, spanning molecules to munitions. PERC addresses existing and emerging challenges related to civilian and military infrastructure, commerce and aviation security. It also supports the U.S. need for more stable, less sensitive and more easily processed energetic materials (propellants, pyrotechnics and explosives). PERC has enjoyed partnerships with nearly every agency within the U.S. defense sector.

“ Having a mentor who truly cared about my success made the work meaningful and allowed me to learn so much technical and professional knowledge.”



Holly O'Brien
Mechanical Engineering
University of Texas – Austin
AAMP-UP '22

“ AAMP-UP has allowed me to experience what graduate school is like without having to fully commit to it. Before attending, I did not consider graduate school at all, but now I’m starting to think about doing a 4+1 for a master’s degree and possibly going for more.”



Joshua Wu
Electrical & Computer
Engineering
Purdue University
AAMP-UP '23

