Dean’s Weekly Significant Activities Report
14 June 2017

The Dean’s Weekly Significant Activities Report is an internal report on all activities conducted within the Departments, Centers & Staff. The Report is provided to the Dean for situation awareness, throughout the organization for shared situation awareness, and to select external organizations for outreach and communication. POC for the report is MS Lesley Beckstrom at 938-5105.

Picture of the Week

[Image of three individuals in a laboratory setting]

ARDEC AIAD: Cadet Tom Ferrara, a rising cow in the ME program, is conducting a challenging and rewarding Advanced Individual Academic Development (AIAD) internship at the Armament Research, Development, and Engineering Center (ARDEC) at Picatinny Arsenal, NJ during the month of June 2017.
Department of Physics and Nuclear Engineering

Completed Events

**APS-DAMOP Attendance:** During 05-09 June, Dr. David O. Kashinski traveled to Sacramento, CA to attend the 48th annual meeting of the American Physical Society’s Division of Atomic Molecular and Optical Physics (APS-DAMOP) meeting. Two recently published papers, both including cadet co-authors, were presented at the meeting. A brief description of the two papers is provided below with a photograph. The meeting was highly successful in that Dr. Kashinski was able to meet and discuss topics of interest with current collaborators as well as make connections with peers doing similar work at AFRL and USAFA. He was also able to advise groups interested in accessing DoD-HPCMP resources for DoD supported projects. Dr. Kashinski wishes to thank the DoD-HPCMP for continued travel support and resources.

Dr. Kashinski presented a poster summarizing the article “Harmonic Vibrational Frequencies: Approximate Global Scaling Factors for TPSS, M06, and M11 Functional Families Using Common Basis Sets” recently published in the Journal of Physical Chemistry A. This work was completed through his ongoing collaboration with Dr. E. F. C. Byrd and the Quantum Chemistry group at the Army Research Lab’s Weapons and Materials Research Directorate (ARL-WMRD). Dr. Kashinski’s focus at the meeting was to summarize the latest paper and present our results and conclusions to the AMO community. He also reported on the progress towards analyzing the accuracy of DFT calculated IR optical spectra of residual molecules and radicals found in muzzle eject of currently fielded weapons and briefly discussed the DFT calculation of the Π vibrational modes (Renner-Teller splitting) in the NCO molecule. The long-term application of this work is to help ARL and the community at large better understand the visual signatures (muzzle flash) of currently fielded and future chemically propelled weapons across all calibers. Resources, computer time, and travel was funded by the DoD-HPCMP.

Dr. Kashinski also presented a poster summarizing the article “Theoretical Studies of Dissociative Recombination of SH ions with electrons through the $^2\Pi$ states of SH” recently published in the Journal of Chemical Physics. This project is a collaboration between USMA, Lehigh University, Universite Montpellier (France), and the Universite du Havre (France). Highly-accurate adiabatic and diabatic potential energy curves of the neutral-SH $^2\Pi$ states and resulting $n = 4$ Rydberg-valence coupling terms were presented. Potential energy curves of the ground $^1\Sigma$ and first excited $^1\Delta$ adiabatic states of the SH$^+$ ion were also presented. Multichannel Quantum Defect Theory (MCQDT) dynamics calculation of the dissociative recombination reaction rate coefficients was compared with recent experimental results (2016) from the Cold Ion Test Storage Ring (TSR) in Heidelberg Germany showing reasonable agreement above 10-meV. The long term application of this work will provide valuable highly accurate rate coefficients and reaction cross section data to the national and international tables of standards and
provide valuable insight into the quantum mechanical interactions of particles and molecules through the lens of high-resolution molecular orbital theory. Resources and travel was funded by the DoD-HPCMP. Computer time was supported by NSF-XSEDE. Collaborator resources were funded by the NSF.

Dr. Kashinski stands by one of the posters presented at the APS-DAMOP meeting

SLE: The Department conducted the Summer Leaders Experience this week and last, hosting 36 candidates each day, 5-7 June and 12-14 June. While in PNE, the candidates levitated a magnet over a sample of superconducting material cooled with liquid nitrogen, calculated and tested the angle to fire a projectile launcher to hit a target, and used different radiation detectors to identify an unknown radioactive isotope, measuring the effectiveness of shielding materials. In addition, they learned how lasers work and how nuclear power is essential for meeting the world’s growing energy needs.

SLE students experiment with properties of electricity
SLE students examine the effects of heating and cooling on properties of matter

SLE students calculate the trajectory necessary to hit a target at a distance

Current Events

AIADs: The D/PNE is sending 32 Cadets on AIADs this summer.
Department of Chemistry and Life Science

Memorial Day at the NY Mets Game

Members of the military were invited to attend the NY Mets baseball game vs the Milwaukee Brewers on Memorial Day (29 May 17). LTC Rich Comitz was invited on the field to represent the Army in the “military takes the field” portion of pre-game show. He was able to interact with members of the NY Mets. This was also televised on the SNY channel. http://m.mlb.com/nym/video/v1441405083/?affiliated=clubMEGAMENU

LTC Comitz talking with Mets first Baseman
Lucas Duda

Department of English and Philosophy

“Writing Today” AIAD Students Dive into Professional Writing around the Beltway

From 31 May through 9 June, 2017, five West Point Cadets from the Class of 2020 met with experts across disciplines about professional writing through the “Writing Today” AIAD in the greater Washington, DC, metro area. The AIAD is co-sponsored by the Writing Fellows Program and Department of English and Philosophy. In some sessions, Cadets handled and viewed historically significant items, such as 16th century handwritten English war manuscripts at the Folger Shakespeare Library and Ulysses S. Grant’s West Point uniform at the Smithsonian’s Museum of American History. In other
sessions, experts conveyed stylistic expectations for drafting specific types of writing: professors at Johns Hopkins and George Mason worked with cadets on expectations for collegiate writing; longtime intelligence analysts at the Pherson Institute trained the Cadets on protocols for drafting the “President’s Daily Brief.” The Cadets took particular interest in speechwriting, as the group conferenced at the Pentagon with speechwriters for the Secretary of Defense and the Chief of Staff of the Army. Additionally, the Cadets met with Terence Szuplat, who described his eight years as one of President Obama’s primary speechwriters and provided drafts of his speeches that included the former president’s annotations and remarks, indicating the working relationship that speechwriters have with their speakers. The group also watched live broadcasts of NPR’s national news segments and met with staff at the Frameworks Institute, where researchers aid non-profit organizations to better convey their messages to the public. The Cadets remarked that, because of their participation in the AIAD, they are now more confident, capable, and articulate writers with better informed perspectives on professional writing opportunities. POCs are Dr. Jason Hoppe, Director of the West Point Writing Program (jason.hoppe@usma.edu), and CPT Kristen Johnson, DEP (Kristen.Johnson@usma.edu).

CDTs Bailey Abercrombie and Matthew Arnold inspect a book dating to the late 1500s with Paul Espinosa, curator of the George Peabody Library at Johns Hopkins University in Baltimore, MD.
The Cadets enjoyed a tour of the historic George Peabody Library at Johns Hopkins University, which houses a collection of books primarily from the late 1800s and early 1900s.
(above) Mr. Geoff Brumfiel, Science Editor for NPR, gives the Cadets a tour of one of NPR’s main studios, where regular programs such as *All Things Considered* are recorded for an audience of millions of listeners.

Department of Civil and Mechanical Engineering

1. **Middle School STEM Outreach**— On 31 May 2017, the Civil and Mechanical Engineering Department at the United States Military Academy participated in a STEM outreach program with middle school students from around the country. Approximately 120 students participated in classes focused on engineering principles. Dr. Chris Conley and COL Joseph Hanus went over the relationship between mechanical stress and strain and ran through an experiment where they conducted tension tests of aluminum and cast iron samples to illustrate the differences in failure methods. The students also learned about the compressive strength of concrete and tested concrete cylinders. Dr. Greg Freisinger led the mechanical engineering session where the students designed a gear train with Legos and used a battery powered motor to lift simulated Army supplies. The team that lifted the supplies the fastest won the coveted C&ME mechanical pencil award, with one team matching the record from last year’s Summer Leadership Experience. It was a fantastic experience for C&ME faculty looking to inspire the next generation of engineers. Point of contact is Dr. Greg Freisinger at gregory.freisinger@usma.edu.

Dr. Chris Conley showing the students how to experimentally find the stress-strain curve for aluminum and cast iron in one of the Mahan Hall laboratories.
Students examining the aluminum and cast iron samples to see the visible differences in how they performed when subjected to a tensile force.

Dr. Greg Freisinger giving an overview of the Civil and Mechanical Engineering Department and how engineers take basic science and apply it to real world problems.
A team of future engineers designing their gear trains to lift the (simulated) Army supplies up a (simulated) mountain. They used multiple gear reductions and a battery powered motor to achieve the torque necessary to accomplish the mission.

Team Engineers and Team Fidget Spinners successfully accomplished the mission and wrote their completion times on the board. This activity helped the students learn about the relationship between torque, velocity, and power and how gears are used to optimize these parameters.
2. Farewell to 2LT Sam Martinez: On 27 May 2017, 2LT Sam Martinez conducted his Commissioning Ceremony at South Dock with the Army West Point Spirit Tank serving as a fitting backdrop, i.e. “security element” to his ceremony. As a yearling ME cadet, Sam took the lead role in the restoration and engineering of the most notable spirit vehicle. During his time as a cadet, he served as the CIC of the Spirit Tank Crew and supported countless events including football games, parades, and charitable events. A gifted engineer and selfless servant, Sam also delivered numerous service projects to clients on post including the Post Chapel, SHARP Conference, and DCA. He also received an award for being the top ME cadet in Automotive Engineering. Sam will attend ABOLC en route to Fort Carson, CO, his first duty station as an Armor Officer. The Department of Civil and Mechanical Engineering is very grateful for three years of dedicated and exemplary engineering service associated with Sam’s notable achievements and efforts. POC is LTC Joshua Keena at joshua.keena@usma.edu or 845.938.8898.

2LT Sam Martinez recites the Oath of Office at the South Dock complex in front of the Army West Point Spirit Tank. On the back of the tank is a flag that draped the casket of Sam’s grandfather. In the foreground is Mahan Hall.
3. **ARDEC AIAD:** Cadet Tom Ferrara, a rising cow in the ME program, is conducting a challenging and rewarding Advanced Individual Academic Development (AIAD) internship at the Armament Research, Development, and Engineering Center (ARDEC) at Picatinny Arsenal, NJ during the month of June 2017. His project supervisor at ARDEC, Mr. Joe Chiarolanza, is the Chief of the Weapons Technical Support Branch. Joe assigned Tom to several machine gun related projects to provide him with practical experience and exposure to several armament related topics including interior ballistics, cartridge design, and dynamic modeling and simulation. Tom has been working on several weapons systems including the Russian 12.7 mm × 108 mm DShK “dish-kuh” and an advanced Lightweight Small Arms Technology (LSAT) prototype. POC is LTC Joshua Keena at joshua.keena@usma.edu or 845.938.8898.

From left to right, Mr. Joe Chiarolanza (ARDEC), CDT Tom Ferrara (ME, ’18), and Mr. Michael Russin (ARDEC) stand next to a tripod mounted Russian 12.7 mm x 108 mm DShK.

4. **National Science Foundation Scholar:** During the month of June, CME hosted 2LT Travis Chewning-Kulick as he conducted ballistic related research in preparation for his post-graduation publication pursuits. A mechanical engineering major from the class of 2017, Travis will be attending graduate school at Stevens Institute of Technology in Hoboken, NJ in the fall. As a National Science Foundation (NSF) scholarship award winner, he chose Stevens for the armament engineering program he could pursue through Picatinny Arsenal. Travis was a stellar cadet, earning numerous honors including Distinguished Cadet, Honor Graduate, and the Superintendent's Award for Excellence. As a cadet, he pursued two independent
studies on weapons related topics and scored in the top of his class in ME490 Weapons Engineering. He also participated in an Advanced Individual Academic Development (AIAD) offering at Picatinny, and was the team leader of a very successful ME496 Capstone Design project that involved the development of a proposed modification of a 105 mm tank round. Travis branched Ordnance and hopes to go Explosive Ordnance Disposal (EOD) after the Basic Officer Leadership Course (BOLC) in a few years. Travis will conduct his research at the Armament Research, Development and Engineering Center (ARDEC) under advisement by the Senior Research Scientist there, Dr. Don Carlucci. Dr. Carlucci is a world renowned expert in ballistics as well as weapons engineering and armament science. POC is LTC Joshua Keena at joshua.keena@usma.edu or 845.938.8898.

Photo of the historic Cannon Gates at Picatinny Arsenal.

2LT Travis Chewning-Kulick stands in front of the historic cannon gates at Picatinny Arsenal

Department Of Social Sciences

Military Times: Blended Retirement

Major Evan Davies and MAJ Patrick Bell continued their installments detailing the military’s new blended retirement plan. The articles provide much needed guidance to those considering the switch between the old defined benefit plan and the new blended plan.
Combating Terrorism Center

Washington Post Coverage

On 12 June the Combating Terrorism Center's Beyond the Caliphate series was highlighted in the Washington Post piece on ISIS in Asia. Don Rassler produced the sound byte, Brandon Mohr and the CTC’s own Marielle Ness, Zaid Thabit produced the work for the series.

NY Times Coverage

On 10 June, the NYT cited the CTC Sentinel's analysis of jihadism in Britain. Paul Cruickshank and Krissy Hummel commissioned the piece.
Terrorism and Political Violence Publication

LTC Bryan Price published in Terrorism and Political Violence on the comparisons between terrorism and cancer and what CT officials can learn from oncologists. This paper provides an alternative framework that conceptualizes the threat posed by terrorism based on an epidemiological approach that views it as a chronic disease like cancer rather than as a military, ideological, or socio-economic problem.