



USMA Department of Chemistry and Life Science

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Department of Chemistry and Life Science, USMA

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Special points of interest:

- COL Allbee's Retirement
- New West Point Science Center
- Cadet Advanced Science and Technology Learning Environment (CASTLE)
- Chemical Engineering
- Update on Cadet IAD(A)
- CDT Jeremy Smith awarded Marshall Scholarship

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Message From the Department Head

Greetings from West Point! As the Department Head, I would like to extend our warmest regards. I am excited about the state of the department and the faculty and cadets who make it a wonderful place to work. Thanks goes to both current and past faculty members for their contributions to the education of our cadets.

Enclosed in this newsletter, you will find an update on the many exciting initiatives, programs, and research that occurs every day here in the Department. Perhaps at the top of the list is the new West Point Science Center. Construction and renovation of the old library began last Spring and should be complete by 2015. The department will experience some hardship with office and classroom space until it is complete, but it will be worth the wait. The new building will be a fan-

tastic addition to a department that is already second to none.

Please help us stay in touch with you by sending in your contact information via email to the address on the back of this newsletter. We would like to stay in touch and appreciate your continued interest. We are also now on Facebook. Please see the link that is also on the back.

From the Department, we wish you well and look forward to frequent interaction with our alumni!

COL David Allbee
Professor and Head



COL David Allbee
Head of the Department



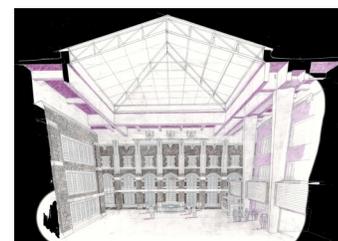
COL Allbee welcomes new instructor MAJ Kick to the department on the annual boat ride aboard the Supe's boat.

Progress Being Made on the New USMA Science Center

Construction is underway at West Point on the new West Point Science Center. The Science Center is a five year project that greatly expands the teaching and research capabilities of the Department. When complete, the Center will include all of what is currently known as Bartlett Hall and also the building formerly known as the library. Construction began

in Spring 2010 and will continue through 2015. With a price tag of over \$139 million, it will greatly expand our capability to educate, conduct research, and inspire our cadets to pursue degrees in Science, Technology, Engineering, or Math. Construction is currently isolated to the old library, but will soon move into Bartlett Hall. The Department is look-

ing forward to the completion of this world class science facility.





COL Allbee receiving the Legion of Merit and Military Outstanding Volunteer Service Medal from the Superintendent, LTG Huntoon.

2LT Brandon Dotson, class of 2010, received the National Science Foundation Scholarship and is now attending graduate school at California Institute of Technology.



Lieutenant Brandon Dotson with his research display at the West Point Museum.



Cadets Koffman, Moore, Heckmann, and Robinson, and LTC Bozic pose next to Cadet Moore and Held's 1st place Environmental Division winning poster at the American Institute of Chemical Engineers (AIChE) National Student Conference.

COL Allbee to Retire in 2011

COL Dave Allbee, serving as the Department Head since March 1990, is set to retire in May 2011. He will be replaced by the current Deputy Head and Professor, COL Leon Robert.

COL Allbee will retire after serving over 40 years on active duty. Prior to becoming the Department Head in 1990, he served as a rotating faculty member. Throughout his time at West Point, he has made an immeasurable impact on countless cadets and faculty. Over the past several years, he was instrumental in facilitating the renovation and construction of the new Science Center. For

his service and achievements he recently received an impact Legion of Merit from the Superintendent. He was also awarded the Military Outstanding Volunteer Service Medal for his work in and around the West Point community during his career.

An avid radio controlled (RC) aviation enthusiast, COL Allbee intends to spend his well deserved retirement building and flying RC aircraft.

We regret the departure of COL and Mrs. Allbee and wish them well in retirement.



Chemistry Program Update

Academic Year 2010 was a record year for the Chemistry Program. We had seven cadets graduate with their BS in Chemistry, two of which were the first to ever graduate with Honors in Chemistry; CDT Archie Overmann and CDT Brandon Dotson. CDT Dotson was a Chemistry/Physics double major and also received Honors in Physics. Brandon was also awarded a National Science Foundation scholarship to go

directly to graduate school at California Institute of Technology. CDT Overmann was awarded the Mid-Hudson ACS Student research Award and CDT Dotson garnered the Undergraduate Student Award in Spectroscopy from the NY Society of Applied Spectroscopy.

In addition, we pre-applied for American Chemical Society certification, under their new (2008) guidelines, and received

an invitation to submit the full application due in December of 2010. The preparation of this application is one of the main current activities of the Chemistry Program for the 2011 Academic Year.

Chemical Engineering Program Update

The Chemical Engineering Program has had another spectacular year of growth and development! Boasts for the Class of 2010 CHEMEs: largest number of graduates (12), American Legion Award winner for the top student in our department, 100% pass rate for the National FE Exam (only engineering program at West Point to do that!), and the list

goes on! Dr. Andy Biaglow, the Chemical Engineering Program Director, was promoted to the rank of full professor; he is the first Professor of Chemical Engineering at West Point! Cadet Erik Moore won 1st place in the Environmental Division of the AIChE National Poster Competition (pictured below) for his and Cadet Nathan Held's work on explosives separation from

ground water conducted during an AIAD at Columbia University. We're always looking for new CHEME AIAD projects and capstones, so please let us know if you're interested in supporting our program! GO Army Chemical Engineering!!

Life Science Program Update

Heterotopic Ossification (HO) is a reaction to blunt trauma and amputation in which bone grows uncontrollably in the soft tissues surrounding the site of injury. Currently physicians are limited in treatment options to removing the extra bone material using surgery once the bone growth has subsided. Cadets and faculty in the department are attacking this problem. A team comprised of cadets Woo Do (2011), Jeremy Smith (2011), Luis Rivas (2011), Diana Kim (2012), and Patrick

Wilver (2013) and faculty members Dr. J. Ken Wickiser and COL Leon Robert, have embarked on a multifaceted approach to assessing the effectiveness of potential therapeutics in a collaboration with Carnegie Mellon University (CMU). The team's job is to measure the impact that experimental drugs, developed at CMU, have on the expression of all the genes in mammalian cell lines; in short, the team is searching for unintended side effects of these drugs so that the CMU-

West Point team can choose the best drug that addresses HO and only the genes associated with the condition. Our department recently stood up a gene expression analysis station including state-of-the-art quantitative polymerase chain reaction (q-PCR) and microarray scanner (DNA chip) instruments. The team is motivated to contribute to a project that involves a condition of utmost importance to many of our warfighters today.



Cadets Pat Wilver '13 and Woo Do '11 working with cell culture in the hood at the Hollinger Lab at Carnegie Mellon University. Pat and Woo are working on developing a therapeutic to inhibit uncontrolled bone growth in the soft tissues surrounding the site of amputation related to a combat injury.

CASTLE (Cadet Advanced Science and Technology Learning Environment)

We have all read the reports concerning the downturn of education in our country relative to other countries worldwide. The department recognizes, as do others, that we need to stop the trend of science phobia among our younger population. We are engaged in an effort to promote Science, Technology, Engineering, and Math (STEM) education to cadets as they come through

the general chemistry curriculum. As part of a larger plan to permanently distinguish the Department as a leader in STEM education, we recently established CASTLE.

Working with the department's internal budget, we established a technology driven, motivational additional instruction classroom where students can receive assistance using tools

that will likely answer their question as well as excite them about STEM fields. If you are at West Point, stop by and we will give you a tour of the facility



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Cadet IAD (Individual Advanced Development) Update

The Individual Advanced Development (Academic), or IAD(A), program offers our cadets summer training opportunities at various civilian universities, government laboratories, hospitals, and private sector organizations. Last summer cadets enjoyed research and training opportunities at Walter Reed Army Institute of Research, Madigan Army Hospital, Carnegie Mellon University, Logos Technologies, the Institute for Collaborative Biotechnologies at The University of California Santa Barbara, The University of Massachusetts Amherst, Nairobi (Kenya), and other great locations. The training and research experiences ranged from shadowing physi-

cians in military and civilian hospitals, making batteries out of viruses at MIT (cadets Mike Theising '11, Galen Mandes '11, and Kelley Cassidy '13), developing biosensors out of DNA and RNA at Yale (cadets Matt Porter '11, Diana Kim '12, and Ashli Carlson '13), advancing conventional battery technology at Fort Monmouth (cadets Gerrit Van Ommering '12 and Patrick Yu '13), generating sensor technology to detect small amounts of chemical munitions at Columbia University (cadets Branko Kovacevic '11, Nathan Held '11, and Erick Moore '13), to engineering the next generation of biofuel cells at the Army Research Lab (cadets Caspar Yi '11, Ethan

Heckmann '13, Alex Goldstein '13, and Abigail Novak '13).

Cadets were granted unique and exciting experiences that help prepare them for the challenges they will face as future leaders in our military by augmenting their learning experience in the classrooms of Bartlett Hall and by reinforcing the lessons taught from textbooks; these cadets are learning by doing as they performing cutting-edge and Army-relevant science during their summer months.



The C&LS Kenya research and cultural immersion trip. From the left is Cadet Jay Clark, Mr. Lance Richardson, Cadet Jeremy Smith, and Cadet Ben Gelman. The four stopped at the hospital dedicated to President Barack Obama.

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If you would like to continue to receive this newsletter by email and continue to communicate with us, please send a brief email to MAJ James at corey.james@usma.edu.

The USMA Department of Chemistry and Life Science is looking forward to connecting with our alumni. Wherever you are and whatever you are doing, we would like to remain connected. Now more than ever, it is easy to stay in touch and we ask that you start by finding us on facebook and send us an email to continue to receive the newsletter. Happy Holidays to all of you, from all of us!

Find us on the internet!

West Point Department of
Chemistry and Life Science



CDT Jeremy Smith, Class of 2011, Awarded Marshall Scholarship

We wish to congratulate Cadet Jeremy Smith (2011) for being awarded a prestigious Marshall Scholarship for graduate study at the Imperial College of London in the United Kingdom. Jeremy is a Life Science (Honors) major and among his many other extracurricular activities, researches the basic biology of ribonucleic acid (RNA) in bacteria and human beings with Dr. J. Kenneth Wickiser and collaborators outside of West Point. Jeremy spent time in the laboratory of Wade Winkler, PhD, at the University of Texas Southwestern Medical Center in Dallas, TX on an IAD(A) researching how RNA-based genetic control mechanisms are involved in the formation of biofilms and spores. Jer-

emy presented his results at the Army Research Lab – USMA Science and Technology Symposium and generated great interest in the Army scientific community which is concerned with understanding how bacteria form these biofilms and spores which improve resistance to chemicals and heat. He has continued pursuing his interest in RNA biology by taking charge of the bioinformatics effort in testing what genes in human cells are affected by an experimental drug produced by collaborators in the lab of Dr. Jeffrey Hollinger at Carnegie Mellon University. Jeremy is especially interested in how this drug – designed to prevent Heterotopic Ossification (HO), or the uncontrolled

formation of bone matter in soft tissue following blunt force trauma (e.g. IED explosion or car accident) – affects the network of genes not in the HO pathway; in identifying these other genes he will determine the unintended side effects of this drug prior to it being entered into clinical trials. Jeremy's work, under the guidance of COL Leon Robert and Dr. J. Kenneth Wickiser, was recently funded by the Department of Defense to address this medical condition given the current need of our warfighters in theater. We wish Jeremy continued success in his classes and research here at West Point and his future academic challenges in London next year.



**CDT Jeremy Smith, '11,
Marshall Scholar.**