FROM THE DEAN’S DESK – February 6, 2015
THE RADFORD UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY NEWSLETTER

Polycotylus latipinnus (fetus) image from a lecture by Cristina Byrd sponsored by the Museum of the Earth Sciences

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In the Bonnie Hurlburt student center auditorium on February 3, Christina Byrd, Paleontology Technician at the Virginia Museum of Natural History, shared her journey to further understand the development and growth of the Plesiosaur.

“Understanding ontogenetic variation in plesiosaurs from the family Polycotylidae can provide insight into the evolutionary history of this group of extinct short-necked marine reptiles from the Cretaceous period” says Ms. Byrd.

Starting with a juvenile polycotylid plesiosaur from the University of Nebraska State Museum (UNSM 55810) which came from the Pierre Shale (99-65 Ma) of Nebraska, Ms. Byrd began a journey which took her across the country to visit a number of sites with collections of fossils relevant to her research.

“Previous qualitative studies have included UNSM 55810 but a formal description had not yet been done” she states. “To understand the ontogenetic variations among polycotylids, I collected metric measurements of UNSM 55810 and compared them among several related plesiosaurs.” This meant she had to travel west to Kansas and California.

At the University of Kentucky Museum of Natural History, Ms. Byrd was able to compare fossils in their collection to UNSM 55810 which contained skeletal elements of a partial skull, nearly complete pectoral and pelvic girdles, and an assortment of paddle elements.

By observing the differences in these fossils, especially within the pelvic girdle, she was able to notice a number of developmental traits from fetus to adult. A specimen in Los Angeles at the Natural History Museum included a mother and baby which allowed for further study of the creature’s development.

“Understanding the morphological changes during polycotylid ontogeny will enhance information for improved identification of subadult specimens” states Ms. Byrd. “In addition, it provides insight to the evolutionary and developmental history of plesiosaur ontogeny and evolution.”
Ms. Byrd is currently completing her analysis of the plesiosaur and is compiling the data into a manuscript which will be released in the near future.

This lecture was sponsored by the RU Museum of the Earth Sciences. Additional lectures are scheduled for the first Tuesday evening of each month during the Spring semester at Radford University. On March 3, Dr. Donna Boyd will present a public lecture about FSI activities entitled: "Inside the RUFSI: 15 Years of Forensic Science Casework, Research, and Education."

**RU PLANETARIUM PRESENTS “AMAZING ASTRONOMERS OF ANTIQUITY”**

Beginning Tuesday Feb 17, travel back in time at the RU Planetarium with the show "AMAZING ASTRONOMERS OF ANTIQUITY" Most people don't know that over 2,000 years ago ancient astronomers knew the Earth was round, measured its diameter and distance from the sun, created an accurate star map with magnitudes, knew the length of the year to the precision of our modern calendar, and developed a method for predicting eclipses? Sailors navigated by the stars and some astronomers thought that the Earth orbited the Sun.

The Amazing Astronomers of Antiquity is a journey of discovery from the Pantheon to the Library of Alexandria, the streets of Leptis Magna, a special statue in Naples, a ship on the Mediterranean and a pyramid in Egypt. This show is produced by Discovery Dome and is 21 minutes long. Shows at the RU Planetarium are held each Tuesday and Thursday at 7:30pm and Saturday morning at 10:30am which is the show that is geared more toward kids and family.

The current show, “It’s About Time,” will continue to play until February 14. In this show audiences go along with future tourists who ride a space elevator to a geosynchronous space station, and peer through the time-spanning Einstein Space Telescope to the far reaches of our galaxy and beyond. This show is appropriate for all ages. “It’s About Time” is produced by Discovery Dome.
On February 3, 2015 students from across our region put their math skills to the test when Radford University's Department of Mathematics and Statistics and the RU Math Club hosted the AMC 10/12 program. The contest requires students to answer 25 questions in 75 minutes. The high scoring students across the county will advance, until a six-person team is chosen to represent the United States. Results of the tests taken at RU will be known in about three weeks.

The event was coordinated by Mr. John McGee, Instructor of Mathematics at Radford University, and hosted by the RU Math Club.

For more than 60 years, students across the country have taken up the challenge of America’s longest-running and most prestigious math contests, The American Mathematics Competitions (AMC).

Every year, at thousands of schools in every state, more than 350,000 students take part in this program, sponsored by the Mathematical Association of America. From their website, the main purpose of the AMC 10/12 is “to spur interest in mathematics and to develop talent through the excitement of solving challenging problems in a timed multiple-choice format. The problems range from the very easy to the extremely difficult. Students who participate in the AMC 10/12 should find that most of the problems are challenging but within their grasp. The contest is intended for everyone from the average student at a typical school who enjoys mathematics to the very best student at the most special school.”

For more information, please visit http://www.maa.org/math-competitions/amc-1012
RUFSI CONTRIBUTES EXPERTISE TO LOCAL FORENSIC DIG INTO PUZZLING COLD CASE

Under trying January conditions, several law enforcement agencies engaged the Radford University Forensic Science Institute (RUFSI) in a forensic homicide investigation of a 40-year-old "cold case."

Cliff and Donna Boyd from the RUFSI were part of a 30-person team, led by the Federal Bureau of Investigation, that was following up on a lead into the 1975 disappearance of two Maryland girls. In a field near Thaxton in Bedford County, the Boyds lent archeological and anthropological expertise to solving what law enforcement calls "The Lyon Sisters' Case."

For four days in bitter winter weather, Cliff Boyd helped the team, which included Maryland and Virginia state police and the Bedford County Sheriff's department, comb a piece of ground about the size of half a football field for disturbances in the soil that might indicate possible burial sites. As such sites were excavated, Donna Boyd supervised the water screening of sites' contents for items of interest in the case.

While the case is typical of the way RUFSI fulfills its public service mission, its poignancy is compelling.

"I cannot imagine the pain that the family has gone through as it waits for closure, especially in a case as old as this," said Donna Boyd.

The team's collaborative effort was impressive as well.

"They were intent on advancing the case. The team was a well-oiled machine and the logistical support was flawless," she said.

As the team continues to gather evidence, the Boyds, as forensic specialists, will assist in its identification and verify its credibility in case of trial. RUFSI and the Boyds have combed the South Pacific beaches for the remains of American Marines and the debris of earthquakes in Haiti for victims. Both Donna and Cliff consult for the Virginia Office of the Chief Medical Examiner, Western District, as well.

RUFSI is an interdisciplinary institute within the College of Science and Technology that promotes and supports forensic science education, research and public service. For law enforcement, RUFSI provides professional consulting in medico-legal aspects of forensic science, including forensic anthropology and
forensic archaeology, as well as prehistoric and historic archaeological cultural resource management projects. For students, the RUFSI provides applied interdisciplinary training in the forensic sciences. For example, RU students assist Donna Boyd in the Virginia Medical Examiner's office and in the field as the RUFSI is consulted.

For more information on the RU Forensic Science Institute, please visit: http://www.radford.edu/content/csat/home/forensic-science.html

For more information about the Lyons Sisters Case, please visit: http://www.wdbj7.com/news/local/investigators-believe-lyon-sisters-may-have-been-brought-to-bedford-co/28318404

Donna Boyd will present a public lecture about FSI activities entitled: "Inside the RUFSI: 15 Years of Forensic Science Casework, Research, and Education" as part of the RU Museum of Earth Sciences Lecture Series on March 3.

COLLEGE OF SCIENCE AND TECHNOLOGY TO HOST OPEN HOUSE FOR PROSPECTIVE RU STUDENTS ON FEBRUARY 28

Students who have an interest in attending Radford University to pursue a major in science or technology are invited to participate in an afternoon open house on February 28 from 11:30-5pm.

In addition to experiencing some of the outstanding outreach programs on campus such as the Greenhouse, Museum of the Earth Sciences and the Planetarium, prospective students will have the opportunity to learn more about financial aid, career services, student leadership opportunities and more. Current faculty and students will be available to help showcase the college. For more information, please visit http://www.radford.edu/content/csat/home/openhouse.html
CYBER AWARENESS HIGHLIGHTED BY LORNA GARDNER FROM NORTHROP GRUMMAN

On February 3rd and 4th, RU students had several opportunities to participate in workshops with Lorna Gardner, Lead Instructional System Designer and Training Developer with Northrop Grumman’s Information Systems Cyber Academy. Ms. Gardner covered a wide range of topics including professionalism, career preparation and development, and the value or cyber security awareness.

During the Cyber Awareness Workshop, Ms. Gardner presented information about different threats that we face every day in information technology and how important strong knowledge of good cyber security techniques are to the modern working world. “Whatever you are majoring in, consider adding a minor in cyber security” said Ms. Gardner. “That extra step will make you much more valuable in the job market.”

Ms. Gardner shared some statistics that illustrate her point as approximately 10% of all Information Technology jobs are related to Cyber Security and it takes 24% longer to fill those positions because of the lack of qualified individuals. “If we cannot secure information in this nation with the people we currently have, we will have to find and pay someone who can” she added. “You have the opportunity to define your career and specialize in it, especially in the area of Cyber Security.”

On Tuesday afternoon, Ms. Gardner shared further information in the ARTIS LAB in an event sponsored by the Women in Technology club at RU. This presentation was focused more directly at future educators and why teachers must have tools necessary to prepare the future cyber security workforce.

In addition to these open forums, Ms. Garner also visited the ITEC 490 class to discuss professionalism and the influence that communication skills can have on professional opportunities. “You are capable of so much more than you know and you need to connect to others to utilize your talents to the fullest” she stressed.
The RU Society of Physics Students and the RU Clubs Programming Committee are sponsoring a guest speaker on Friday, Feb. 6, at 4pm in Reed Hall 201 featuring RU Alumnus Mike McCaughan, RU Physics Class of 2007. Mike is the Crew Chief for the CEBAF Electron Particle Accelerator for the Jefferson National Accelerator Facility in Newport News. He will share some of his experiences at that facility and what he has learned at various “accelerator schools” as his education is always continuing. His presentation is titled “An Overview of the CEBAF Particle Accelerator”

The Thomas Jefferson National Acceleration Facility (TJNAF or JLAB) is one of 17 of our national laboratories, and the only one located within the Commonwealth of Virginia. The lab’s primary mission is to conduct basic research of the atom’s nucleus using the lab’s unique particle accelerator, known as the Continuous Electron Beam Accelerator Facility (CEBAF). Jefferson Lab also conducts a variety of research using its Free-Electron Laser, which is based on the same electron-accelerating technology used in CEBAF.

In addition to its science mission, the lab provides programs designed to help educate the next generation in science and technology, and to engage the public.

This lecture will discuss the facility itself, its operation, as well as some of the experiments in which the lab has presently and historically engaged.

Mike continues to serve Radford University as a member of the College of Science and Technology Advisory Council.

Come by early to meet Mike and have some refreshments starting at 3:45pm.

In addition to his work with the Society of Physics Students at RU, Mike was also a student founder of RU’s chapter of Sigma Pi Sigma, the physics honor society. He started the organization’s first signature book and was the first student signer.

Events such as this lecture are part of the mission of SPS. The Radford University chapter was recently recognized as a “Notable SPS Chapter” for the work they sponsored in the 2013-2014 academic year.
DEPARTMENT OF CHEMISTRY DESIGN FEATURED ON THE COVER OF A NATIONAL JOURNAL

Dr. Tim Fuhrer, Assistant Professor of Chemistry and his student researcher, Angel Lambert, have had a paper accepted by the Journal of Computational Chemistry with the title “Isolated Pentagon Rule Violating Endohedral Metallofullerenes Explained Using the Huckel Rule: A Statistical Mechanical Study of the C84 Isomeric Set.” In addition to being a featured article, they were also asked to provide an image for the cover of the edition.

It is available online at:

CHEMISTRY ON THE SILVER SCREEN – FEBRUARY 24 IN WALKER HALL 279

Interested in learning about the portrayal of “Chemistry on the Silver Screen”? Do they get the chemistry right in shows like Breaking Bad?

Come to Walker 279 Tuesday, February 24, at 7 PM to hear why science is finding a bigger place on the silver screen and in our living rooms. What’s behind this new attraction and how is Hollywood and the scientific community making the portrayal of the scientist and science more accurate? Join us for a discussion with real life Hollywood science advisors and learn from their behind-the-scene stories. Networking starts at 6 pm with the Webinar at 7 pm.
RECENT HIGH IMPACT PRACTICES AWARDS HIGHLIGHT OUTSTANDING EFFORTS WITHIN CSAT

Members of the College of Science and Technology were recently notified of funding awards and SCI designation for projects, classes, and travel that underscore the innovative teaching, research, communication and service that take place every day within CSAT.

Dr. Tim Fuhrer received an award to attend the SIGCSE 2015 Conference and LittleFe Buildout Event. SIGCSE is the Association for Computing Machinery's Special Interest Group on Computer Science Education, which provides a forum for educators to discuss issues related to the development, implementation, and/or evaluation of computing programs, curricula, and courses, as well as syllabi, laboratories, and other elements of teaching and pedagogy.

LittleFe is a portable mini-cluster which is small enough to fit in a suitcase, is light enough to easily move between classrooms, and travels as standard checked baggage to conferences and workshops (a waterproof, wheeled shipping case is included, and all together the package weighs less than 50 pounds).

LittleFe's primary focus is turnkey classroom demonstrations of, and exercises in, High Performance Computing (HPC), parallel programming, and Computational/Data Enabled Science and Engineering (CDESE). LittleFe supports shared memory, distributed memory, and GPGPU parallelism. LittleFe’s secondary focus is as a production HPC resource for small institutions that are not yet able to afford or support a full scale cluster; in fact, LittleFe can be used as a gateway to and development platform for full scale HPC resources such as XSEDE.

Dr. Sara O’Brien, Assistant Professor of Biology, is teaching a Biology 460 course entitled “Science and Society” that was recently approved for Scholar-Citizen Intensive Designation. In this course, students will engage in a self-reflective process to help them make connections between their academic experiences and knowledge and their participation in civic life.

Dr. Jason Davis, Assistant Professor of Biology and Director of Scholarly Outreach Research Engagement (S.C.O.R.E.), was recently awarded funds to produce a SCORE Film festival featuring the work of RU student researchers that will take place in later in Spring 2015.

Congratulations to Drs. Fuhrer, O’Brien, and Davis.
MATH CLUB TO SPONSOR A CHALLENGE FOR STUDENTS AND FACULTY ON FEBRUARY 13

Make plans to join the math club to learn more about the department and to share in good fellowship among other mathematics fans. For more information please contact Hanna Mitchell at hmitchell9@radford.edu

CSAT STEM CLUB MAKING CYBER AWARENESS GAME TO AID IN OUTREACH TO LOCAL SCHOOLS

As a part of their ongoing science and technology outreach efforts, the CSAT STEM club is developing a board game that will help participants learn more about safe internet use. The game will feature both safe and unsafe practices that are typically found as one uses information technology. The goal of the game is to safely navigate the board and learn tips to improve personal cyber security.

The game will be used with area middle and high school students to help them further understand their personal exposure to risks found online. For more information, please contact RU CSAT STEM club President, Matti Hamed at mhamed@radford.edu
CAMP INVENTION AT RU SCHEDULED FOR JUNE

Camp Invention is a nationally recognized, non-profit elementary enrichment program backed by the National Inventors Hall of Fame. Over the past 40 years, and in partnership with the U.S. Patent and Trademark Office, the Camp Invention program has encouraged nearly two million children, teachers, parents, college students and independent inventors to explore science, technology and their own innate creativity, inventiveness and entrepreneurial spirit.

Kids from the first through sixth grades can participate in Camp Invention at RU this June 22 – 26. Local educators will serve as faculty to lead the week of hands-on fun at Radford University, sponsored by the College of Science and Technology.

Registration is now open and participants who sign up by February 16 can save $35.

For more information, please visit: http://inventnow-web.ungerboeck.com/programsearch/moreinfo.aspx?event=12027

SUMMER BRIDGE APPLICATIONS REQUESTED BY THE COLLEGE OF SCIENCE AND TECHNOLOGY

The Radford University College of Science and Technology Summer Bridge STEM program is a week-long residential experience for rising sophomore, junior, and senior high school girls interested in science, technology, and mathematics. The 2015 edition of the program will take place from Sunday, July 12 – Friday, July 17, 2015.

Applications are now being accepted for the 2015 program. More information is available at: http://www.radford.edu/content/csat/home/summer-bridge.html