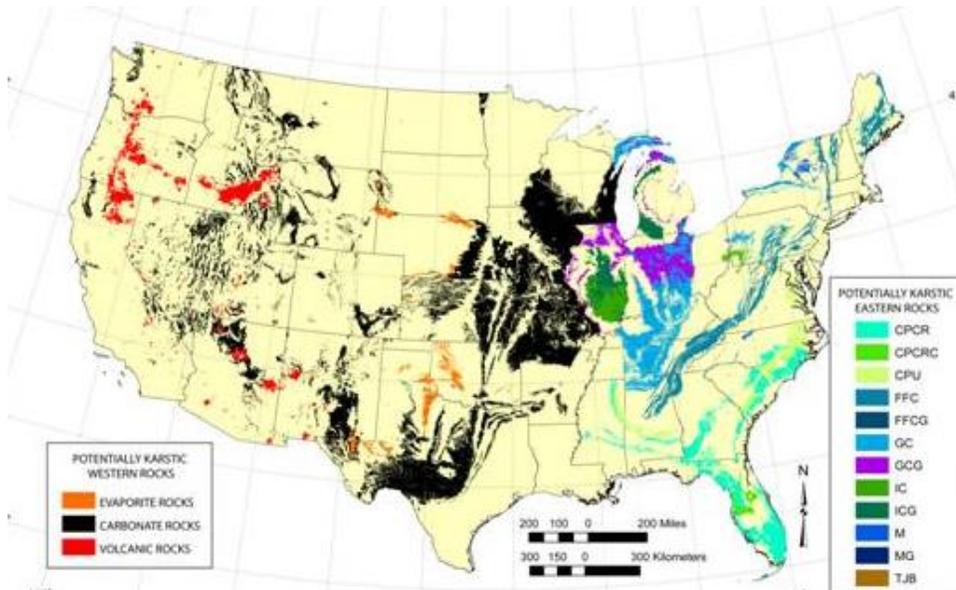


FROM THE DEAN'S DESK – March 2, 2017

THE RADFORD UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY NEWSLETTER



Potentially karstic rocks in the contiguous United States from the work of Geologist Randy Orndorff, the featured speaker in a presentation sponsored by the Radford University Museum of the Earth Sciences.

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RADFORD IT TEAM TAKES SILVER AT THE INAUGURAL VIRGINIA FUSION CYBER CUP COMPETITION

A team of Information Technology students from Radford University placed second at the inaugural Virginia Cyber Cup Capture the Flag competition on February 25 held at Virginia Military Institute. In the competition, teams tackled problems in scenarios designed to model real-world computer security challenges across a range of categories that includes cryptography, network traffic analysis, reverse engineering, steganography, memory forensics, and pen-testing.

The Radford team consisted of members Jacob Walters, Mehdi Himmiche, Harry Frank, Joey Burt, Michael Basala, Sean Anderson and Coach Dr. Darrell Parsons, who also serves as an instructor in the IT Department. Joining the participating team members were additional students Ben Adams, Carlie Addicks, Danielle Pompa, Matthew Wallace who were observers, preparing for the opportunity to participate in future competitions.

The Radford team performed very well, narrowly losing to Virginia Tech in the last 15 mins of the competition and missing the top spot by just .055% (60 points out of 1100. Teams from other schools around the Commonwealth were James Madison University in third place, 250 points behind RU, George Mason, George Washington, Marymount, Longwood, VMI, and NVCC.

This inaugural Virginia collegiate cyber competition combined the cybersecurity competition utilizing the Virginia Cyber Range with a job fair, keynote speaker, and panel discussions. Hosted by Virginia Military Institute and sponsored by the Virginia Secretary of Technology and Senator Mark Warner, the Commonwealth Cyber Fusion emphasized the integration of technology with policy and intelligence.

The Virginia Cyber Range is a Commonwealth of Virginia initiative with a mission to enhance cybersecurity education in high schools, community colleges, and universities. The range provides an extensive courseware repository for educators and a cloud-hosted virtual environment where students will practice what they have learned in immersive, hands-on laboratory exercises to complement their cybersecurity courses. The Cyber Range will largely operate as a virtual center. Offerings will be crafted and hosted in the “cloud,” where they can be accessed by participating schools and agencies. This approach will allow for easy customization, scalability, and responsiveness, while minimizing costs.

The Virginia Cyber Range brings together faculty from George Mason University, James Madison University, Longwood University, Norfolk State University, Virginia Tech, and Radford University, as well as faculty from Lord Fairfax Community College, Northern Virginia Community College, and Tidewater Community College.



The Radford University team working to solve problems during the 2017 Virginia Cyber Cup. (Picture from VMI.)

KARST AND QATAR FEATURED IN MUSEUM OF THE EARTH SCIENCES LECTURE

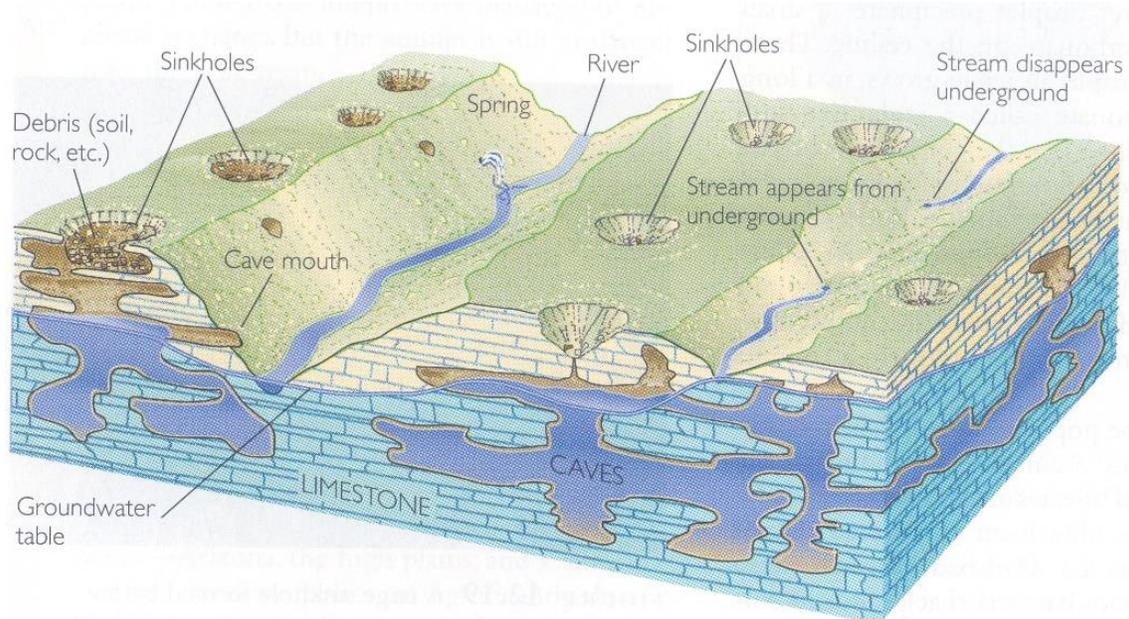
What lies beneath the surface of many areas might surprise you, especially if the ground suddenly opens up and swallows a house or car. These natural hazards were discussed in a presentation by Geologist Randy Orndorff on February 21 at Radford University entitled “Geology of Karst Landscapes - The Importance of Understanding Processes in a Changing World.”

President of the Geological Society at Radford University, Ian Gammarino, shared his thoughts about the presentation. “The room was abuzz with students and teachers alike as I stood up to introduce our first guest speaker of the semester, one who had traveled far (almost halfway around the globe) to be with us that evening” recalled Ian.

“Randy, a research scientist at the USGS Headquarters in Reston for going on 36 years, had recently returned from a research trip in the Middle Eastern country of Qatar, mapping karst topography” stated Ian. “Karst is one of Randy's specialties.”

For an hour and a half guests were introduced to the concepts of caves and sinkholes, their dangers, and what it means to live in a karst environment. “Because the Elbrook formation, which underlays more than half the campus, is composed primarily of dolomite, every Radfordian has the chance to go caving or at least observe sink holes if they care to” stated Ian.

The presentation featured different karst related case studies including a missing bedroom in Florida, the corvette museum in Kentucky, and others. Randy shared that he has been called by CNN news anchors frequently to talk about collapses and other natural hazard calamities.



An example of how sinkholes can be created in areas with karst.
Image courtesy :<https://ericrossacademic.files.wordpress.com/2013/12/karst.jpg>

Randy recently returned to his position as a research geologist for the Eastern Geology and Paleoclimate Science Center after spending much of the last year as Acting Director for Office of Science Quality and Integrity (OSQI), where he was tasked with monitoring and enhancing the integrity, quality, and health of United States Geological Survey science through executive oversight and development of strong practices, policy, and programs.

Having previously served as Director of the Eastern Geology and Paleoclimate Science Center, Randy has been responsible for overseeing geologic mapping and paleoclimate studies in the eastern United States as well as karst, landslide, and earthquake hazards.

The presentation concluded with a review of internship opportunities at the USGS. "As the president of the Geological Society, I thought this beneficial because it is my hope that students from Radford continue to experience the awesome opportunity of interning at their Headquarters in Reston as I have been so lucky to have been able to do for the past two years" stated Ian.

The program was sponsored by the Museum of the Earth Sciences (MES) and the Radford University Geological Society. The MES has recently added several new items to the exhibits on display including a replica of the skeleton of a dire wolf. The dire wolf (*Canis dirus*, "fearsome dog") is an extinct species of the genus *Canis*. It is considered one of the most famous prehistoric carnivores in North America.



Ian Gammarino '17, President of the Geological Society at Radford University and Randy Orndorff, US Geological Survey Scientist.

New displays and a new location have boosted the lifetime visitor count for the museum over 28,000 with a record number of guests coming in 2016 for the MES grand opening at homecoming and previews earlier in the year.

The RU Museum of the Earth Sciences hours for the Spring Semester 2017 are:

**Monday – 10a - 3p , Tuesday - 10a – 3p, 6p – 7p , Wednesday - 10a – 2p , Thursday - 9a - 2p, 6p – 7p
Friday – Closed, Saturday - 10a – noon, Sunday – Closed**

There is no charge to visit the Museum of the Earth Sciences.

BIOLOGY STUDENTS EXPLORE IMMUNOLOGY IN REAL WORLD SITUATIONS

Dr. Sarah Redmond, Assistant Professor of Biology, is conducting a Scholar-Citizen Initiative (SCI) centered version of the Biology 337 Immunology class. The class explores basic principles, such as cells and molecules of the immune system, humoral and cellular immunity, serology, diseases caused by immune responses and current applications of immunologic procedures. The SCI approach helps introduce real world discussions, activities and outreach to apply and enhance the knowledge gained in the class.

Immunology accomplishes this through a semester long project investigating the impacts of stress on the immune response of college students. Students in BIOL 337 work with the campus Institutional Review Board from day 1 of class so that they can become certified to conduct research on human subjects, and then collect saliva samples and administer surveys related to stress levels across campus.



Biology students in lab conducting surgical scale grafts on goldfish as a part of the study of immunology.

Dr. Redmond explains that “In the lab, students use a test that measures the amount of immunoglobulin A, a protein produced in the immune response which is negatively correlated with stress levels.” She adds “Students perform outreach as part of the participant recruitment process – they practice answering questions about their research and describing their scientific goals and reasoning to a wide audience.”

Students in the class will present their results formally at the Student Engagement Forum in April which will allow them to give more specific descriptions of their analysis and the conclusions they have made.

“This year we are coordinating with Dr. Stockton Maxwell’s geospatial science students to generate “stress maps” of the Radford University campus” states Dr. Redmond. “Many of the students from BIOL 337 will be traveling in May to Washington DC for the American Association of Immunologists meeting to present their projects.”

The experience enhances the learning process for participants. “Students definitely develop their ability to find and evaluate information online as they are researching the cases – they have to look up normal clinical test values, what the tests are actually measuring, what possible problems could explain the

symptoms in the case” said Dr. Redmond. “I’ve had several former students let me know how that skill has helped them getting into and succeeding in graduate and medical school.”

Having a relatable approach helps engage the class on a higher level. “Students really like being able to do work that they perceive as “high stakes” in lab – the goldfish scale grafting lab is always one that they enjoy since they get to anesthetize and resuscitate their fish, and they take a lot of ownership of their semester-long project” added Dr. Redmond. “I think taking on the role of researcher, especially during sample collection, is an eye opener for them.”

One of the participants agrees. “I think it is a great opportunity for the students who are non-science majors to see what goes on with research and how much fun it can actually be” said Haley Burger. Her classmate Nate Welch added “I realized the participants were really excited about the project. There were many participants that wish to attend the forum at the end of the semester to see the results. I’m looking forward to then because it would be amazing to have a room full of people who participated in our study to see our final results and hard work.”



A student examines her goldfish in the immunology class.

STUDY BEGINS TO MODERNIZE LABORATORIES WITH ELECTRONIC NOTEBOOKS

Dr. Sarah Kennedy, Assistant Professor of Chemistry, is working to explore the feasibility of using electronic notebooks in a modern laboratory setting as opposed to the traditional paper versions. The first step in that study is taking place on Friday, March 17th from 3-4pm EDT during a webinar on the subject demonstrating the product that would be used. Interested parties are welcome to join in the webinar.

“LabArchives Electronic Laboratory Notebook Professional Edition Demo”

Fri, Mar 17, 2017 3:00 PM - 4:00 PM EDT

Please join my meeting from your computer, tablet or smartphone.
<https://global.gotomeeting.com/join/265226573>

You can also dial in using your phone. United States: +1 (646) 749-3117

Access Code: 265-226-573

First GoToMeeting? Try a test session: <http://help.citrix.com/getready>

SOLERS REPRESENTATIVE VISITS CAMPUS TO OFFER STUDENTS CAREER ADVICE

On Wednesday, February 15, 2017, one of the leading companies in innovative Information Technology solutions visited campus. Solers is an IT provider to the Department of Defense (DoD), Intelligence Community (IC), other federal agencies, as well as commercial customers.

Greg Caufman from Solers' Blacksburg office met with students in the IT professionalism class to talk about Solers and to answer questions on resumes, career fairs, interviewing, and navigating job offers. Greg shared his thoughts about preparing for interviews. "You need to have a personal elevator pitch that differentiates you from your peers" he said. "Tell the story of what makes you unique."

Many students are not as well informed about the work of their prospective companies and that can be a big trap. "Do your homework when you are looking for a job so you can be informed when you approach a potential employer" added Greg. "Interviews of different length can take place at any time in the process, so you have to be ready with your resume and the highlights of who you are and how you could meet their needs."

Corporate culture and fit does go both ways though. Greg advised students to "know what you are looking for in a position or a company." He added "This includes their expectations, locations, types of projects and other intangibles that might impact your satisfaction with the organization."



Greg Caufman meeting with IT students.

Information Technology job searches can provide particular challenges in that there may be very targeted technical requirements for a position. On that subject Greg said "Most companies don't have you complete a technical interview (where a candidate is asked to code or complete a task) but if they do, you must be prepared to handle it." He emphatically stated "You have to know what you say you know how to do on your resume and you must show that you can solve problems."

Greg also shared information about Solers, the company he represents. Cutting edge technology employed by Solers directly supports mission objectives and critical national security imperatives. Solutions range from ingesting, processing, and distributing data from weather satellites for the National Oceanic and Atmospheric Administration (NOAA) to cybersecurity where the company uses the World's largest Active Directory instance from Microsoft to provide identity and access management solutions.

Solers has a co-op program that allows students to work full-time at their company alongside experienced software engineers while still in school. At Solers, students will develop customer-facing applications that will be deployed and used around the world. A position has been reserved for at least one opening in their co-op program in fall 2017 for a qualified Radford CS or IS major. Learn more at <https://www.radford.edu/content/csat/home/itec/students/student-jobs/solers-coop.html>

ECO CONNECTIONS LIVING LEARNING COMMUNITY IS BLOSSOMING AT RADFORD UNIVERSITY

One of the more contemporary concepts in higher education has been the adoption of living-learning communities where groups of students form a cohort around a theme where they are housed together and engage in programming that touches a specific major or area of interest. In the fall of 2016, a new living-learning community formed with the guidance and aid of CSAT faculty in the area of ecology.



Early stages of the PVC pipe based hydroponic garden.

In the Environment/Community Connections community, freshmen explore the environment and sustainability. In addition to themed courses with other ECO students, participants have been designing and implementing environmentally-themed projects on the RU campus, the Selu Conservancy as well as the surrounding community.

Their most recent project is a hydroponic garden that will grow plants without soil. Constructed of PVC pipe, the garden will use nutrient enriched water to feed the plant material in a vertical environment, a project that explores using a minimum amount of space for maximum output. During a recent construction session for the garden, Dr. Stockton Maxwell from the department of Geospatial Science and a faculty member in the ECO program stated “The purpose of ECO is to push Radford University to the forefront of the teaching of environmental issues in both the sciences and humanities.” He added

“Radford students currently have very limited opportunities for truly interdisciplinary scholarship and coursework; environmental studies bring diverse disciplines – hard sciences, humanities, social sciences, law – together in an organic whole. ECO brings together students from across majors and disciplines who have an interest in engaging with the most challenging issue facing Radford students: the rapidly changing relationship between human societies and the physical world in which they exist.”

The program introduces students to multiple approaches to the study of major issues facing humans as they build societies in this changing environment. The ECO Connections Learning Community was established by Dr. Brock Cutler from the Department of History, Dr. Rick Roth from the Department of Geospatial Science, Dr. Sara O'Brien from the Department of Biology, Dr. Laura Vernon and Dr. Rick Van Noy from the Department of English, and Dr. Jake Fox from the Department of Anthropological Sciences. Dr. Cutler is the lead coordinator.

Currently, there are seven students in the learning community with majors ranging from biology to geology to communications to business. The group is recruiting for a new class of 20 now that the pilot phase is over.

The College of Science and Technology has been engaged in this concept for several years beginning with the Biology Connections community for the past two years for RU freshmen who have declared Biology as their major. Students in this community will engage inside and outside the classroom through intentional biology related programming, linked courses taken with other Biology Connections students, and added academic support through peer tutors, advising, and study sessions. This program is unique in that it is centered on a specific course of study.

An additional learning community focusing on the maker movement has been spearheaded by Dr. Rhett Herman and is based in Peery Hall with an associated maker space in the facility.



Dr. Stockton Maxwell and Cora Bland making smoothies using a bike powered mixer during the Eco Connections Learning community hour. Cora is biology major in the environmentbiology concentration.

PLANETARIUM TO STREAM SOLAR ECLIPSE IN SUMMER 2017

In late April the planetarium will start a series of eclipse-themed shows produced by leading solar scientists. Throughout the summer, shows will be offered during the daytime so that after the program - weather permitting - guests can go outside and safely view the sun with special solar viewing glasses.

On Monday, August 21st, there will be a live streaming presentation from a group led by Radford University Physics faculty member Dr. Michael Freed, who will lead a group to southeastern Tennessee to be in the path of solar eclipse totality. Stay tuned for details (shows will be posted on the planetarium calendar pages in mid-March).

The Planetarium will be closed March 4-12 for Radford University's Spring Break but will resume regular hours on March 21. Please visit www.radford.edu/planetarium for details.

TALK ABOUT TOMORROW: STEM CLUB TO SPONSOR PROGRAM ON APRIL 5TH

In a world where information can be confusing, misleading, and difficult to process, great communicators are needed now more than ever. The STEM club in the College of Science and Technology is hoping to help cultivate speakers and give them the opportunity to share their thoughts with the campus community with a new program called TALK – Teach, Ask, Listen, Know. On April 5th from 5-8pm in Bondurant Auditorium, students, faculty, and staff will share their visions for the future in short, ten minute presentations that are certain to enlighten and entertain. Each presentation will be followed by an audience interaction for questions or comment. The theme of the program is “Helping Humanity for Tomorrow.”

The program is spearheaded by Hanna Mitchell, President of the STEM club and is part of the mission of the organization to further the exploration of Science, Technology, Engineering, and Mathematics. Everyone is invited to submit a proposal for consideration in the program and the deadline is March 15. Contact hmitchell9@radford.edu for details.

CSAT STEM CLUB TO SPONSOR TRIP TO MUSEUMS AND ZOO IN WASHINGTON DC

The STEM club of the College of Science and Technology is planning a trip to visit several Smithsonian Institution museums as well as the National Zoo on March 25. The visit will include excursions to the Air and Space museum and the Natural History museum on the National Mall. Tickets for the one-day trip will be \$20 per person. For more information, please contact any STEM club member or Club advisor David Horton (rhorton@radford.edu)



Image from the Smithsonian Institution.

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 19 - 23. 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. For more information, please visit:

<http://inventnow-web.ungerboeck.com/programsearch/moreinfo.aspx?event=16842>

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 2017 edition of the program will take place from Sunday, July 9 – Friday, July 14, 2017.

Applications are now being accepted for the 2017 program. The application process will close on March 20, 2017.

More information is available at: <http://www.radford.edu/content/csat/home/summer-bridge.html>