FROM THE DEAN'S DESK – December 9, 2016

THE RADFORD UNIVERSITY COLLEGE OF SCIENCE AND TECHNOLOGY NEWSLETTER

Members of Beta Beta Beta Biology Society hiking old growth forest in Lilley Cornett Woods

CUR INSTITUTE HELPS CSAT FACULTY LEARN MORE ABOUT ENCOURAGING UNDERGRADUATE RESEARCH

Most students look forward to Thanksgiving Break as a time to unwind, sleep late, and forget about exams. However, for the Radford faculty, the same break provides them with the opportunity for professional development.

Amy Balija, Sarah Redmond, Sarah Kennedy at CUR

That was the case for three CSAT faculty, professors Sarah Redmond from the Department of Biology and professors Amy Balija and Sarah Kennedy from the Department of Chemistry.

From November 18th-20th, the three professors attended the Council of Undergraduate Research's "Beginning a Research Program in the Natural Sciences at a Predominately Undergraduate Institution Institute."

This institute provided some of our newest science faculty the ability to learn how to develop and manage a successful undergraduate research program, how to successfully apply for external grants, and how to develop successful collaborations.

At the end of the meeting, the participants had developed short and long term research plans as well as a desire to improve research experiences for both the student and faculty member. Travel and participation funds were generously provided by the CSAT Dean's Office and the Office of Undergraduate Research and Scholarship.

CSAT ADMISSIONS OPEN HOUSE SCHEDULED FOR FEBRUARY 25, 2017

RADFORD UNIVERSITY
SCIENCE AND TECHNOLOGY OPEN HOUSE

Prospective new students for the College of Science and Technology are invited to campus to meet with faculty and students to learn more about STEM programs at Radford University on Saturday, February 25, 2017. The annual event allows for exploration of the outstanding research and classroom facilities and is being held in conjunction with the Highlanders Day program for the first time. Additional details will be forthcoming and those who have questions or would like to register can contact rucsat@radford.edu or call 540-831-5958.

CYBER SECURITY FOCUS CONTINUING TO GROW IN DEPARTMENT OF INFORMATION TECHNOLOGY

Cyber security is one of the most pressing and challenging issues facing industry, organizations, and individuals. The Department of Information Technology at Radford University continues to work toward serving a variety of communities in numerous areas of study.

RU provides an undergraduate certificate in cyber security that meets two National Security Agency (NSA) standards. In addition, educators from middle schools, high schools and community colleges can take a graduate course in Cyber Security Education.

During the fall of 2016, the Department conducted an extremely successful preliminary round of a Capture the Flag competition. 70 teams representing 289 high school and community college students participated with one team at Thomas Jefferson High School in the Northern Virginia area locating all the flags. A championship round will be held in the spring. These types of programs provide excellent opportunities for participants to strengthen their skills in a variety of areas including cryptography, binary analysis, reverse engineering, mobile security and more.

"The demand for cyber security professionals is projected to far exceed the number of graduates produced by higher education," said Chair of the Department of Information Technology Jeff Pittges. "Our Department is committed to providing the highest quality cyber security education to ensure that our graduates master the necessary skills and best practices to protect the Commonwealth and the nation."

To better meet the growing needs for Cyber-Security professionals, the department has proposed to establish an exciting new computer science degree to meet the industry's increasing demand for qualified cyber defense professionals.

The Radford Board of Visitors recently approved the proposal to introduce a Bachelor of Science in Computer and Cyber Science (BSCCS), the Commonwealth's first such degree offered by a public institution.

Pending approval by the State Council of Higher Education for Virginia, the new program would enhance the College of Science and Technology's (CSAT) robust cyber and information technology disciplines and provide more in-depth preparations for current and prospective students seeking careers in cyber defense.

The proposed BSCCS would be a spin-off degree from CSAT's current computer science degree. The proposed 120-credit hour BSCCS program would combine the university's CORE curriculum, core courses from the Department of Information and Technology, classes from the Information Security Certificate, as well as newly-developed courses.

"It is critically important that Radford University continue to innovate to meet the expectations of the booming science and technology careers that many of our students will pursue," said Radford University President Brian O. Hemphill. "As the demand for cyber security professionals continues to grow, we are excited to assist in this effort with the proposed new Bachelor of Science in Computer and Cyber Science."

The BSCCS would be among a number of academic opportunities the university offers to prepare some of the most sought-after students and faculty in the cyber security field.

Members of the business community have made clear that many security solutions require big data management and analysis. This fall, Radford launched a new Master of Science in Data and Information Management (DAIM). DAIM will produce professionals with the knowledge and hands-on experience to collect, manage, process, and protect traditional data and big data emphasizing security and information assurance. Students work closely with corporate partners in healthcare and other industries to rapidly prototype and evaluate emerging technology to solve data management and security problems.

"Radford University is consistently recognized among the higher education institutions at the forefront of meeting the evolving demands of cyber security education," said CSAT Dean Orion Rogers. "We are excited about the opportunities the proposed BSCCS degree could offer."

The university was recently designated as a National Center of Academic Excellence in Cyber Defense Education (CAE-CDE) by the NSA and the U.S. Department of Homeland Security. Radford is one of only seven four-year institutions in Virginia to earn the prestigious national CAE-CDE designation. The Department of Information Technology leads a multi-disciplinary Center for Cyber and Information Security that includes the Department of Criminal Justice, the Department of Mathematics and Statistics, Forensic Science Institute and Academic Computing.

In addition, the university received news that a nearly $34 million renovation project to Reed and Curie Halls – the university's science and technology hub – has been authorized to proceed with planning. The project would include a Cyber Security Training and Education Lab for teaching, research, modeling and simulation of cyber threats.

CSAT ACCEPTING APPLICATIONS FOR SUMMER BRIDGE 2017

The College of Science and Technology has announced that the popular STEM experience for High School women, Summer Bridge, will be returning again in 2017. July 9-14 will see young women from across the Commonwealth and the nation return to the Radford University campus for an immersive week of fun with science.

Applications are now being accepted at https://www.radford.edu/content/csat/home/summer-bridge.html

CELEBRATE CELESTIAL SIGHTS OF THE SEASON WITH THE RADFORD UNIVERSITY PLANETARIUM

In December, as days are short on the Radford University campus, seasons of light are on display in the new campus planetarium. *'Tis the Season* is a spectacular show about the holiday season that holds some of the warmest and brightest celebrations of the year, while for the northern hemisphere, it the coldest and darkest of seasons.

The show will trace the development of many of the world's endearing holiday customs, and how they light up the winter season.

Visitors will have the chance to learn why we burn a Yule log and the meaning of sparkling Christmas tree lights as well as additional celebrations of light such as the Menorah and luminaries.

Through the magic of the planetarium dome, guests will travel through space and time to learn more about the historical religious and cultural customs practiced during the time of winter solstice, including Christian, Jewish, Celtic, Nordic, Roman, Egyptian and Hopi. The show explores the possible astronomical explanations for a "Star over Bethlehem" including comets, meteors, novae, supernovae, and planetary conjunctions.

Some of the more light-hearted seasonal traditions are also reviewed including gift-giving, kissing under the mistletoe, songs about lords a-leaping and ladies dancing, the custom of decking the halls with greenery and candles, and Santa Claus.

From an astronomical point of view, you will learn about some of the Northern winter constellations and learn how the seasons are caused by the Earth's tilt and orbit around the Sun. Shows will run on several dates through December.

December 10 & 17 – 10:30am

December 13 – 7pm

December 19 – 7pm

December 20 – 5, 6:15, and 7:30pm

Planetarium shows are free and open to the public. The planetarium is located on the first level of the Center for the Sciences building, room M75. Visitors should enter the center from Main Street, through the doors next to the planetarium sphere. Seating is limited to 55 people, and no food or drinks are allowed.

For a full schedule and description of the shows, visit the Radford University Planetarium website.

BIOLOGY STUDENTS VISIT LILLEY CORNETT WOODS

In November, a group of biology students visited southeastern Kentucky to experience a forest that is essentially the same as it appeared prior to the U.S. Civil War. Located in Letcher County, Lilley Cornett Woods (LCW) encompasses 554 acres of mixed mesophytic forest. A portion of the total acreage, 252 acres, is designated as "old-growth" forest; a forest which has not undergone any manmade changes in 150 years.

Beta Beta Beta members enjoyed a beautiful afternoon in the Lilley Cornett Woods.

As a part of the trip the group, made up of members of the Beta Beta Beta biology society at Radford and led by Assistant Professor of Biology Dr. Matt Close, met with representatives of Eastern Kentucky University who operate the area. Dr. Close has been visiting the LCW for several years as a part of the Appalachian Herpetology program, but this was a unique visit for Tri-Beta members.

There is a great biodiversity of plants and animals within the Lilley Cornett woods with over 530 species of flowering plants and an estimated 700 breeding pairs of birds present. In addition, a variety of small mammals, amphibians and reptiles call LCW home.

BBB members hiking the old growth forest

Due to the unique nature of this ecosystem, it is an ideal location for ecological and environmental research. Thirty six completed studies have been documented, ranging from small animal surveys to hydrological investigation and archeological assessments of rock shelters. One of the most important investigations has been the decadal forest composition research which has taken place over the past 40 years.

The group was able to engage with members of the community following their day in LCW at a dinner and Veterans' Day celebration. To learn more about the Lilley Cornett Woods, please visit them online at: http://naturalareas.eku.edu/lilley-cornett-woods-appalachian-ecological-research-station

BUDDING BOTANIST FEATURED IN VIRGINIA NATIVE PLANT SOCIETY PUBLICATION

Ryley Harris

In September 2016, the Virginia Native Plant Society held its annual meeting in the New River Valley, including a field trip to Wildwood Park. Society President Nancy Vehrs had the opportunity to meet Radford University Biology student Ryley Harris and conducted an interview with him that is featured in the Fall 2016 edition of *Sempervirens*, the quartery publication of the society.

During the interview, Ms. Vehrs asked Ryley about a number of topics including the origin of his interest in nature. "Throughout my childhood I was influenced heavily by my experiences of the natural world" stated Ryley. "Hiking and exploring the baldcypress swamps around Virginia Beach were a regular activity. From a young age, I was enthusiastic about ethnobotany."

Ryley went on to describe how his Radford University experience has influenced his enthusiasm for florae and fauna. "The first botany course I took at Radford was 'Plants in Society,' where I learned about the cultural uses of plants, and also about non-timber forest products like Black Cohosh and Ginseng" he recalled. "That class was great, but it wasn't until later that I learned to ID plants. The next class I took was "Flora of Virginia," taught by VNPS member John Kell. It was the only time the class has been taught at Radford, so I am very glad I was able to take it." Ryley added "It was through this class that I was able to learn botany in a way that meshed with my style of learning. Looking for patterns among plant families made plant ID a lot more intuitive for me."

Ms. Vehrs went on to ask Ryley about his selection process that led him to Radford. "From some older friends, I heard Radford was a great and affordable school, surrounded by really biologically interesting areas" he stated. "Also, I have always felt drawn to the mountains. It may be all the time I spent in the rural Outer Banks that gave me an appreciation for the isolation and serenity being in nature provides."

The Selu garden and service club received an award for the activites during the 2015-2016 academic year.

Ryley is actively engaged here on campus and serves as the president of the Garden Club at Radford University where leads his fellow students in an effort to manage and propagate Radford University's first sustainable garden at the Selu Conservancy. "We grow food using intensive planting methods and donate the produce to those in need in the community" he told Ms. Vehrs. "We plan to create a permanent teaching garden, in which native plants can be showcased for classes that come to tour the garden."

Ryley also had praise for several members of the Radford Biology faculty. "I have several mentors, the first of whom would have to be Dr. Christine Small, an accomplished forest ecologist and former chair of Radford's biology department" he said. "In my

sophomore year, I wasn't sure what direction I wanted to take with my biology career. She got me involved with some of her research at Selu Conservancy, looking into how plant communities respond to the introduction of an invasive species, in this case Rosa multiflora, which got me interested in the complexities of the plant world." Ryley added "Darrell White, Radford's greenhouse manager, has also done a lot for me."

Having taken "Plants in Society," Ryley had wonderful things to add about the experience. "Another influential person in my academic life has been Mr. Kell, who taught the class that transformed my perspective on botany" he said. "I am happy to say I learned and retained more in his class than in any other class I have taken. He has continued to work closely with me to refine my plant ID skills, often taking the time to join me for walks in Wildwood Park and around Radford. I am hoping to find some sort of career where I can apply botanical skills. I'm studying data modeling and GIS systems so I can develop a broad skill set."

Ryley got involved with the Virginia Native Plant Society through another contact he met by chance. "I met Mary Rhoades, head of the New River Chapter, while working on a flower phenology project for the University of Virginia's Mountain Lake Biological Station" he stated. "We hiked from the biological station to Bear Cliffs, an overlook at 4,000 ft., and identified every flowering plant we could. This was this past May, a great time to observe and catalogue the amazing floral diversity of springtime in the mountains. After talking for a while, she asked me if I'd like to lead a walk at the Annual Meeting, and I enthusiastically accepted."

Ms. Vehrs sought advice from Ryley about ways that the VNPS could connect with younger people. "Unfortunately, a lot of people truly have no idea how simple and fun plant identification can be" he said. "I think this is because these skills are rarely taught in a university setting now. I think holding well-publicized events showcasing different topics revolving around native flora would draw a lot of interest from a younger demographic. Going through university channels to get the word out, or having a university-sponsored event, could also help."

Ryley also mentioned another local NRV opportunity to connect. "I recently worked with a woman in Floyd County, leading a yoga/plant hike" he said. "A lot of younger people were there. They're out there—it's just a matter of getting networked."

The entire interview is available at the Virginia Native Plants Society website:
http://vnps.org/download/sempervirens/Sempervirens(2).pdf

CHEMISTRY STUDENTS PREPARE FOR LIFE AFTER GRADUATION

On Monday, December 5th, students in the Department of Chemistry participated in a research poster session and mock interview exercise to help further develop the skills they will utilize following graduation from Radford University.

Dr. Chris Monceaux, Assistant Professor of Chemistry, and Ms. Stacey L. Turmel, Director of the MBA Program, help prepare students for interview questions they might face for graduate school or the working world.

Spearheaded by Dr. Chris Monceaux, Assistant Professor of Chemistry, the event was held in conjunction with the Radford University Career Center and featured a number of professionals who conducted interviews with the students and then gave advice based on what they observed. What to wear, how to discuss certain topics, and what to expect were all reviewed in the session.

The wrap-up session provided valuable advice to seniors who will soon be on the job market.

CSAT FUNDRAISING MOONSHOT IN FINAL STAGES

The College of Science and Technology (CSAT) has the opportunity to have a million dollar year, but additional support is needed to reach the final goal.

If the College can raise $700,000, The Mary Morton Parsons Foundation of Richmond will donate an additional $350,000 to help enhance the academic and outreach facilities in Radford University's new Center for the Sciences. That's $1 million for science education and outreach!

There is still approximately $140,000 left to raise in order to reach the $700,000 goal and "unlock" the additional $350,000 challenge grant.

Any gift geared toward the Center for the Sciences (CFTS) can count. Displays in the new building, support for programs that conduct research or teach in the CFTS, programs that utilize the new facility, and more can count toward the total.

The College has never had an opportunity quite like this before and the results could provide for many new prospects among students and faculty in the future. The real challenge is in spreading the word and encouraging people connected to the College to participate.

Over recent weeks, an additional 133 specified gifts from donors added $8,327.36 to the total. There is still time to reach the goal.

Faculty, staff, students, and alumni are encouraged to consider this opportunity to expand the impact of a gift and help CSAT have a million dollar year. A gift of $10 becomes $15 if the $700,000 goal is met, securing the $350,000 challenge grant.

Questions can be directed to David Horton at 540-831-6277 or rhorton@radford.edu.