From the Dean’s Desk - - April 25, 2014

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To celebrate its nine 2013 Dean’s Scholars, more than 60 faculty, family and friends joined Dean J. Orion Rogers of the Radford University College of Science and Technology(CSAT) for a ceremony and reception Saturday, April 12 in 201 Reed.

"You are the embodiment of hopes and dreams for our students. We are honored to be your teachers, mentors, advisers and friends," said Rogers. "Dean's Scholars are students who have taken advantage of the opportunities provided by our faculty and made success happen."

Beyond excelling in the classroom, the CSAT dean scholars have been active in undergraduate student research – analyzing metric and non-metric techniques for cranial identification and exploring sickness behavior in wild birds among other initiatives.

"He is one of the smartest people I have known since I have been teaching," said Dr. Elizabeth McClellan, associate professor of geology, as she introduced the Department of Geology's Dean Scholar Matt Sublett, a senior from Pulaski, Va. "His academic success is amazing and he has cheerfully done research and collected samples in the field."

Matt worked with Dr. McClellan to research 750-million year-old rock formations in Southwest Virginia from the supercontinent that had been exposed during continental drift. He was also a member of RU’s award-winning P3 team that earned a $90,000 grant from the Environmental Protection Agency for research into development of a procedure to use ubiquitous materials for water filtration.
Matt and his fellow Dean's Scholars were awarded a plaque and crimson stole to be worn with their caps and gowns. Joining Matt as 2014 CSAT Dean Scholars are:

Abbey Humphreys from Virginia Beach representing geospatial science and introduced by Dr. Richard Roth. Abbey, along with David Doherty and Devin Dalton, presented their research regarding the "Contribution of nonpoint source pollution to water quality of Crab Creek in Montgomery County" during the Radford University Student Engagement Forum on April 24 during the Geospatial Science Poster Symposium at the forum.

Christopher Huntington from Christiansburg representing information science was introduced by Dr. Art Carter. Chris was part of the Collegiate Cyber Defense Challenge team that recently had a successful third place finish during the Mid-Atlantic regional competition at Johns Hopkins University.

Larry Kittinger from Christiansburg representing computer science was introduced by Dr. Art Carter. According to Dr. Carter, the Computer Science concentration is the most technically challenging program we teach in the department. Despite requiring advanced calculus, advanced statistics, advanced physics and the most theoretical course that we teach in the department Mr. Kittinger, received an A in every class he took for this degree.

Dylan McDaniel from Pulaski County representing biology was introduced by Dr. Jason Davis. Dylan recently presented his research on “Stress as a modulator of immune function and sickness behavior” as well as “Identification of environmental bacillus” at the Biology Oral Presentation session during the Student Engagement Forum.

Benjamin Thompson from Roanoke representing anthropological sciences was introduced by Dr. Donna Boyd. Ben recently presented a research project co-authored with Eminent Professor of Anthropology Donna Boyd at the American Academy of Forensic Sciences (AAFS) Annual Scientific Meeting in Seattle, Washington titled "A Comparison of the Metric and Non-metric Techniques Used in the Classification of Hispanic Crania." The presentation addressed a topic of urgency to the forensic community and beyond.
Brian Uthe from Frederick, Maryland representing physics was introduced by Dr. Walter Jaronski. Brian has been working with the wind tunnel in Curie Hall to determine if dimples, similar to those found on a golf ball, on car surfaces might help improve fuel efficiency by reducing wind drag.

Rebekah Webster from Pulaski representing chemistry was introduced by Dr. Christine Herman. Rebekah was also a member of RU’s award-winning P3 team that earned a $90,000 grant from the Environmental Protection Agency for research into development of a procedure to use ubiquitous materials for water filtration.

Jessica Wheeler from Knoxville, Tennessee majoring in both mathematics and dance was the selection from the Department of Mathematics and Statistics and was introduced by Dr. Juergen Gerlach. Jessica was unable to be at the event due to a dance presentation in New York City, but was presented with her plaque and stole by Dean Rogers on April 15.

The 2014 CSAT Dean Scholars will be graduating in RU’s Commencement Ceremonies May 9-10 and then head off to destinations like UVA to study material science and engineering, Mercyhurst University to study forensic anthropology and a Ph.D. program in biology at Virginia Tech.

A Dean’s Scholar is a graduating senior nominated by CSAT faculty representing each of the college’s nine degree programs. Dean’s Scholars have demonstrated success in the classroom, laboratory and other activities related to their chosen discipline.

- Story by Don Bowman
RU CSAT TO INITIATE UNIQUE RETENTION AND SCHOLARSHIP PROGRAM

The National Science Foundation (NSF) last week awarded a grant of $602,101 to the College of Science and Technology (CSAT) for a scholarship, retention and career development program called "RU-NextGen: Preparing the Next Generation of Leaders in Science, Technology and Mathematics."

The program will support academically qualified but financially disadvantaged students from high schools and community colleges and their pursuit of a critically-needed STEM (Science Technology Engineering Mathematics) major and career. The grant, which includes six to eight scholarships per year, will also include a leadership development program to encourage their retention and career development.

The successful grant means RU-NextGen will begin in Fall 2014. RU-NextGen was developed by a seven-person RU team. The principal project investigator (PI) is Premchand Uppuluri, associate professor of information technology. Co-PI’s are Orion Rogers, CSAT Dean and professor of biology; Ian Barland, associate professor of information technology; and Jean Mistele, assistant professor of mathematics and statistics. Assisting with the grant development and in the implementation of the program are Laura Jacobsen, interim associate dean of the College of Graduate and Professional Studies; Bethany Bodo, director of academic assessment; and Sandra Baker, associate director of academic assessment.

"The RU-NextGen grant will enable the CSAT to recruit, advise and mentor students as majors who demonstrate the ability to pursue a STEM degree and the dedication to enhance their leadership skills," said Dean Rogers. "We anticipate awarding scholarships averaging $6,000 each to students with demonstrated unmet financial need and academic success in high school or community college. These scholarships further the CSAT missions of providing extraordinary learning opportunities to motivated students and of educating future problem solvers and researchers who are committed and prepared to assume leadership roles in professional STEM disciplines."

The RU-NextGen is a successor to a recently completed NSF-grant program that RU CSAT implemented in 2009, called "Bridges and Pipelines: Success and Leadership in Science, Technology, Engineering and Mathematics (STEM)" program. Central to the new degree completion program is the formation of an innovative umbrella group, called ELITES (Emerging Leaders in Science, Technology and Mathematics). ELITES is designed to help participating students succeed academically, sharpen their career and leadership development skills and encourage professional growth opportunities like research assistantships and internships on the way to STEM career success.

"We want to directly alleviate student financial burden and help ensure that students' passion for a career in STEM majors stays strong," said Dr. Uppuluri. "Through this program, we can be proactive in helping develop their skills and careers."

The ELITES program will support student progress by monitoring its cohort's individual action plans. Among the initiatives contained in the ELITES program are summer research projects, leadership or honors contracts to encourage active classroom engagement, peer mentoring and cohort-building social and academic exercises.
The new program complements other successful CSAT STEM development initiatives like the pre-college Summer Bridge Program for high-school age women who aspire to careers in science, its schedule of science competitions for regional students and its STEM Club. The RU-NextGen and ELITES programs supports the Commonwealth of Virginia’s drive to increase the statewide pool of STEM professionals outlined in the January 2011 "Preparing for the Top Jobs of the 21stCentury: The Virginia Higher Education Opportunity Act of 2011."

- Story by Don Bowman

DOMINION CONTINUES TO SUPPORT YOUNG GIRLS' PATH TO RU'S SUMMER BRIDGE

When Radford University's Summer Bridge program begins in July, the program will have a familiar partner in its mission of introducing high school girls to careers in science, technology, engineering and mathematics (STEM).

Since 2009, Dominion Resources, one of the nation's largest producers and transporters of energy, has provided $25,000 yearly to the RU Summer Bridge program. The generous gifts total $150,000.

"Education is one of the Dominion’s core philanthropic areas," said Cindy Balderson, manager of Dominion’s Corporate Philanthropy and Community Partnerships. "The Summer Bridge program is an excellent educational program for high school students interested in STEM-related subjects."

An essential element of Summer Bridge, hosted annually by RU's College of Science and Technology (CSAT), is demonstrating to high schools girls, especially those from families of modest means, that higher education is within reach and introducing them to careers in science and technology that they might not have considered otherwise.

CSAT Dean Orion Rogers is grateful for the "generous and consistent support" Dominion provides to the Summer Bridge program.

Participants from the 2013 Summer Bridge.
RU Biology Majors have been granted 4 of the 5 campus-wide Highlander In Action (HIA) awards from the Scholar-Citizen Initiative program. These HIA awards are given to students based on their successful submission of a competitive application to explore academic activities beyond the classroom. The award provides summer funding that allows students to explore opportunities such as local, national, or international internships, community-based research projects, volunteer projects, and summer immersive projects.

Recipients of the award from the College of Science and Technology are Cassie Bonavita, Emily Guise, Matti Hamed, and Katharyn Self. Peter Weber, a junior philosophy and religious studies major from Winchester is the recipient of the fifth award. "These students stand apart," said Erin Webster-Garrett, director of RU’s Scholar-Citizen Initiative. "They are intrepid travelers and researchers who have designed, developed and will soon be implementing their own research projects with faculty collaboration and encouragement."

Cassie Bonavita, a junior biology major from Radford, will work with faculty at the Universidad de Costa Rica to collect and dissect two different species of mosquitoes that harbor the virus that gives rise to dengue fever. Her work will explore the correlates of mosquito gut bacteria to viral load as groundwork for a possible understanding of disease transmission and prevention. Cassie’s faculty mentor is Justin Anderson, associate professor of biology. Cassie said of the project “I was already doing research on mosquitoes and then I got into the study abroad program and it seemed like a good way to sample in an infected area. “ She added “I hope to find infected and un-infected mosquitoes and their bacterial colonies in the digestive tract differ as we predict to see. If not it’s back to the drawing board for my project.”

Emily Guise a senior biology major from Leesburg, will study freshwater fish for the possible effects of the endocrine disruptor trenbolone. Trenbolone is an endocrine-disrupting chemical found in local agricultural run-off and this study may serve as a model for assessing the potential public and environmental impact of prolonged exposure, on the behavior, development, and reproduction of freshwater fish. Emily’s faculty mentors are Sara O’Brien, assistant professor of biology, and Jason Davis, assistant professor of biology. “I came up with my idea through weekly meetings with the Ecophysiology Club here on campus” Emily said. “Each week a student will choose a paper and present it to the group. One week, a student presented a paper on the topic of trenbolone, an Endocrine Disrupting Chemical (EDC) that acts as an androgen mimic, and I found it very interesting. As a result I spent my free time researching trenbolone and its various qualities and effects and found some holes in the research. There were no studies that I could find that looked into the multigenerational effects of trenbolone on reproduction and reproductive behaviors.”

Emily wants to know just how long a female fish can be androgenized before she is no longer able to reproduce. “This topic is highly relevant to the environment (including humans), as we are being exposed to EDCs every day” she said. “It is difficult to realize the effects of EDCs as we have lived so long under their influence. I hope to further define these effects and make such knowledge available to those who are affected by androgenic EDCs like trenbolone.”
Katharyn Self, a junior biology major from Virginia Beach, will explore the synergetic effects of three common endocrine disrupting chemicals (EDC) with strong estrogenic effects that leach into food from the protective inner coating of canned foods and other food storage devices on freshwater fish to elucidate behavioral and developmental effects. Katharyn’s faculty mentor is Sara O’Brien, assistant professor of biology. Katharyn’s interest in this subject began early in her Radford experience. “My freshmen year, I joined Dr. O’Brien's research lab. She introduced me to the idea of endocrine disrupting chemicals, and as I did more and more research on EDC’s the idea stuck” she stated. “I found it very interesting how there was a small amount of research on individual EDC's but, almost nothing on what happens when there are combined together, which is more relevant considering most people expose themselves to multiple EDC's daily. So, my project became to study the effects of combined estrogenic EDC's, at an ecologically relevant level.”

Katharyn added “I hope this research will lead to a better understanding of estrogenic EDC’s. Previous research has pointed out side effects of individual EDC’s even at what is considered to be safe levels but, I am expecting to see some synergistic effects when they are combined. So, that people may revaluate what is considered to be a safe level of a EDC”.

Emily's and Katharyn's work will explore the diminishing dichotomy between human health and environmental health as humans continue to be exposed to a ubiquitous mixture of chemicals of concern.

Matti Hamed, a senior biology major from Roanoke, will be establishing a sampling method for determining the species diversity of local amphibians and reptiles at the Selu Conservancy. She will also be spearheading the design and implementation of an educational outreach workshop to teach the public about the importance of maintaining a rich species diversity of amphibians and reptiles as well as where to find and how to identify these creatures. Matti’s faculty mentor is Matthew Close, assistant professor of biology. “Dr. Close wants to build a drift fence with a variety of traps for capturing reptiles and amphibians to develop a long term study of reptiles and amphibians at Selu” stated Matti. “This summer we will be tagging two varieties of snakes for recapture to get an idea of population density.”

Inquisitiveness led Matti to her project. “I chose to tag Diadophis punctatus, ring-neck snakes, because we have a variety of sub species in our natural history collection at Radford” she said. “Only northern ring-neck snakes are supposed to inhabit Virginia. I would like to take a look at them. It is unlikely that we will find any other sub-species, but I am curious.”

Matti also hopes her work can help serve the general public as well. “Storeria occipitomaculata, red belly snakes, are often mistaken as ring-neck snakes” Matti stated. “We actually had one mislabeled in our natural history collection. One of the topics I would like to include in the workshops this summer is proper identification. Misidentification is common for snake species and often results in people killing snakes because they think they’re poisonous. Ring-neck and red belly snakes provide an excellent example. Also, ring-neck snakes are not often seen out in the open which is not conducive to visual encounter survey. Trapping them and tagging them will provide an accurate population density.” Matti added “They are often quite abundant which means that they are probably an important mid-level predator.”
In their own unique way, all of these projects meet the learning goals of the Scholar-Citizen Initiative: To enhance student learning through real-world problem solving as well as foster a culture of engaged learning and scholarship. Each of the participants will develop an e-portfolio of their experience, make oral presentations at the Fall 2014 Highlander-in-Action Forum and participate in the Scholar-Citizen Speakers Bureau about translating their experiences into social action for the community.

For more information on the HIA award, please see Scholar-Citizen Initiative homepage: http://www.radford.edu/content/scholar-citizen/home.html

- Don Boman and Sara O’Brien contributed to this story.

CSAT FACULTY MEMBERS RECOGNIZED FOR THEIR PUBLISHED BOOKS

At a reception sponsored by Provost Sam Minner and McConnell Library, RU Faculty and Staff who have completed published books over the past year were recognized for their efforts. Two of the faculty authors were from the College of Science and Technology: Mr. John Kell, instructor in the Department of Biology and Dr. Joe Chase, Professor in the Department of Information Technology.

John’s book is entitled, "Ferns and Herbaceous Flowering Plants of East Texas" and the description at Amazon.com reads: "This manual on herbaceous plants of eastern Texas complements Nixon's (2012) manual on the woody vegetation entitled 'Trees, Shrubs, and Woody Vines of East Texas.' Together, they cover essentially all of the East Texas flora....Only the native species and those introduced species which have been naturalized are included." This book should be available through on-line book stores and in McConnell Library in the near future.

Joe’s book “Java Foundations: Introduction to Program Design and Data Structures” is in its third edition and is presently available online, through local booksellers and at McConnell Library. In the description from amazon.com the book is depicted as “a comprehensive resource for instructors who want a two-or three-semester introduction to programming textbook that includes detail on data structures topics. Java Foundations introduces a Software Methodology early on and revisits it throughout to ensure students develop sound program development skills from the beginning. Control structures are covered before writing classes, providing a solid foundation of fundamental concepts and sophisticated topics.”

Congratulations to John and Joe on their accomplishments.

- Karen Powers contributed to this story
RU SENIOR EARS AWARD FROM REGIONAL SECTION OF AMERICAN CHEMICAL SOCIETY

Radford University senior Dennis Godward was among 11 regional undergraduate chemistry students honored at the 22nd Annual Undergraduate and High School Poster Session, sponsored by the Virginia Blue Ridge Section of the American Chemical Society (ACS,) Wednesday, April 16, in the Muse Banquet Hall.

Dennis, a chemistry major from Thaxton, Va., received the group's James Lewis Howe Award for outstanding undergraduate chemists as part of the evening's activities which included a talk by Sam Kean, a writer who has covered science for the New York Times Magazine, Psychology Today and National Public Radio's "All Things Considered."

"It is an honor to be recognized by people whom I respect and care for," said Dennis, who will start graduate school at Virginia Tech in material sciences in June. "There are many deserving classmates, yearmates and peers who are as worthy of this recognition as I."

Joseph Wirgau recalled Dennis' first day at RU and said, "It feels more like a colleague is being honored. His successful transition from a career in banking says a lot about his ability to relate to a wide spectrum of people as well as his accomplishments in the lab."

Dennis is a member of the 2013 award-winning student design team at the Planet, People and Prosperity (P3) competition that earned a $90,000 grant from the Environmental Protection Agency to develop a sustainable purification system from synthetic humic acid materials. Godward was also a Grand Champion Award winner at the 2013 Sigma Xi Graduate and Undergraduate Colloquium at George Mason University.

"RU is as competitive as any place I could have gone, thanks to the hands-on, experiential opportunities that were available to me," he said. "As a grad school candidate, it felt good to sit confidently next to graduates of top schools from across the country and talk the same language."

Hannah Gullickson (left) and Skye Hicking (right) were one of four RU teams presenting their research posters at the Virginia Blue Ridge Section of the American Chemical Society poster session and dinner in the Muse Banquet Hall.
Among the 11 undergraduate student/faculty research collaborations presented at the poster session were four by RU students:

- Mehmed Pehlic, Morgan Lusk and Professor of Chemistry Christine Hermann on "Extraction and Analysis of Oils from Peanuts and Corn"
- Skye Hicking, Hannah Gullickson and Assistant Professor of Chemistry Kimberly Lane on "Mutagenic Characterization of the Bacterial Loop of the E. Coli Beta-Glucurondase"
- Charles Folsom, Gina Burchett and Lane on "Mutagenic Analysis of the Oligomerization of E. Coli Beta Glucurondase"
- Dylan McKnight and Assistant Professor of Chemistry Tim Fuhrer on "Revealing the Binding Affinity of Beta Glucurondase/Ligand Complexes via Computational Chemistry"

Dylan McKnight, a biology major who is minoring in chemistry, talked about his two-year experience investigating the toxic side effects of an enzyme that is used in chemotherapy, saying: "You can't just Google this stuff. I have a greater understanding of the scientific process as a whole, learned problem solving and critical thinking skills and certainly appreciate why it is so expensive and time-consuming to bring new drugs to market."

As he browsed the poster session, the event's significance was apparent to CSAT Dean Orion Rogers, who proudly said, "These are chemists taking their first steps on a long professional journey. It is exciting to see them presenting original research, responding to questions and criticism and learning from each other as they seek to improve society and the world."

- Story by Don Bowman

STUDENT PRESENTS RESEARCH AT THE AMERICAN ASSOCIATION OF PHYSICAL ANTHROPOLOGY MEETINGS

Brittany Hundman, student in Anthropological Sciences, presented her research on the Stonebridge cemetery site at the American Association of Physical Anthropology meetings in Calgary, Alberta Canada on Saturday, April 12, 2014. The Stonebridge site in Midlothian, Virginia is an unmarked African-American cemetery that dates from the mid to late 19th century. Although small with just six burials, its analysis represents an important addition to the growing body of information on the enslaved African experience in Virginia. The study used stable isotope analysis to reconstruct diet, as well as evidence of antemortem pathologies to reconstruct the health of those interred at the cemetery. The results suggest a diet heavily composed of corn and terrestrial animals, likely pigs. They also suffered from multiple episodes of stress and diseases during their early developmental years and considerable musculoskeletal stress during their adult years.

Brittany conceptualized the project and collected samples from the site. Anthropological Sciences faculty members Dr. Donna Boyd, Dr. Cliff Boyd and Department Chair Dr. Cassady Yoder Urista worked with Brittany to analyze the results and to co-author the paper and poster.
Eleven Radford University Geology Students presented research and/or co-authored talks during the Southeast Section of the Geological Society of America (GSA) conference on April 10 and 11 in Blacksburg, VA. GSA coordinators were impressed with the level of engagement and involvement of the RU undergraduate students in projects, posters and presentations. Many additional students were able to take advantage of the close proximity of the conference this year as well.

Other Radford University student presenters were, Nick Aitcheson, Brian Havens, Kelsey McGee, Sarah Montgomery, Tess Rogers, Matt Sublett, and William Wilson.
RADFORD UNIVERSITY TO HOST SUMMER BRIDGE PROGRAM JULY 13-18

The Radford University College of Science and Technology Summer Bridge program is a week-long residential experience for rising sophomore, junior, and senior high school girls interested in science, technology, and mathematics. The 2014 edition of the program will take place from Sunday, July 13 – Friday, July 18, 2014.

Thanks to many generous donors and sponsors of the program, full scholarships will be awarded competitively to participants. The scholarships cover all costs of the program. Through classroom lessons, laboratory experiments, and field experiences, Radford University professors will draw students in to the wonders of:

- Space Exploration—create a Martian rover
- Geology—study the making of mountains
- Forensic Science— combat “hackers” and analyze “crime scenes”
- Genes, Molecules and Medicine - learn about the biology and chemistry applications in medicine

- Environmental Science - studying habitats through examination of the environment

Participants in the program have stated that the interaction with Radford University faculty and staff has been an exceptional experience as has the residential programming. For many, it will be their introduction to a college atmosphere and campus living environment. An experienced staff of Radford University students will join the faculty and professional staff to provide a world-class program for those who attend.

Please help us connect young women interested in the sciences with this outstanding opportunity and pass this message along to those who might be interested. Thanks to support from our sponsors, we will be able to offer the program to even more budding scientists moving from 73 participants to 96.

Applications are now being accepted. To learn more, please visit:

http://www.radford.edu/content/csat/home/summer-bridge.html
RADFORD UNIVERSITY TO HOST CAMP INVENTION JUNE 23-27

For five years, Radford University’s College of Science and Technology has offered the nationally-acclaimed Camp Invention program to children entering grades one through six in Reed and Curie Halls each June. The 2014 edition of the program is scheduled for June 23-27.

For more information, please visit:

CSAT STUDENTS, FACULTY, AND STAFF TO HELP CREATE AN ORGANIC GARDEN AT SELU ON APRIL 26

From 12:30pm until 4pm on Saturday, April 26, members of the Radford University community will gather at the Selu Conservancy to help create the very first student-run garden at Selu. The concept is to help students see conservation and sustainability in progress through the use of the plants cultivated in this garden.

Several CSAT students and faculty have been instrumental in helping the project move to this point and all members of the community are encouraged to participate. Please contact selu@radford.edu for more information.