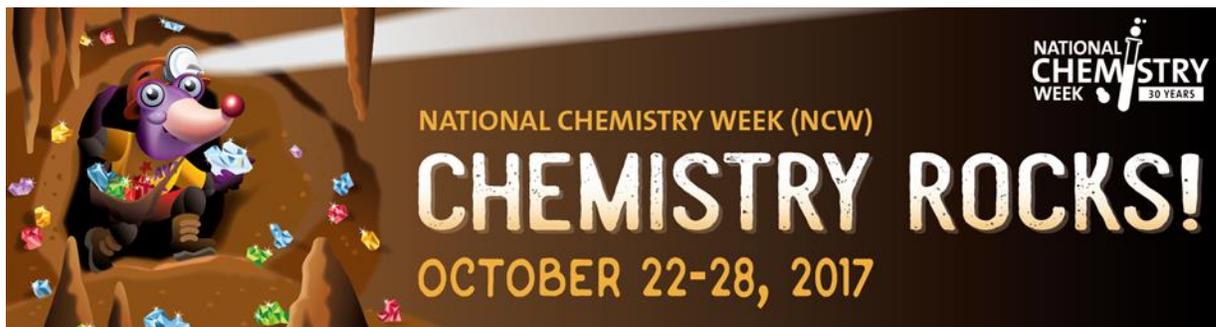


FROM THE DEAN'S DESK – November 1, 2017
THE RADFORD UNIVERSITY ARTIS COLLEGE OF SCIENCE AND TECHNOLOGY NEWSLETTER



The Radford University Chemistry Club celebrated National Chemistry Week in October.

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STUDENT AND FACULTY RESEARCH HIGHLIGHTED AT SYMPOSIUM AND CELEBRATION

The 5th Annual Summer Research Celebration took place Tuesday October 10th in the Bonnie Auditorium from 11 am to 5 pm. Nineteen undergraduate research fellowship winners in anthropological sciences, art, biology, chemistry, dance, health and human performance, mathematics, music, psychology and members of the Radford Amazon Research Expedition teams from 2017 were featured. The event, sponsored by the Office of Undergraduate Research & Scholarship (OURS) helps students further their communication skills as they explain their work to colleagues

The 2017 Summer Research Celebration included

Oral Sessions with

James Board - "Modeling Tick Populations Through Differential Equations"

Kimber Cheek - "The Effects of Cranial Growth and Architecture on Pediatric Blunt Force Trauma Survivability"

Melissa Kesterson - "Effect of Phenazine Derivatives on Mosquito Survival and Virus Replication"

Alex Atwood - "The Detection and Quantification of Trenbolone in Laboratory, Field, and Tissue Samples Through Use of High Performance Liquid Chromatography"

Laura Purser - "Study of the Removal of Pollutants from Water Through the Synthesis and Characterization of Biorenewable Polymers using DL-Lactide"

Kris Moore - "Synthesis and Encapsulation of Organic Pollutants in Aqueous Environments"

Evan Cowling - "Synthesis of Novel Xenophilic Metal Clusters"

Conner Philson - "Impact of Anthropogenic Environmental Disturbances on Primate Feeding Behaviors Measured Via A Custom-Designed Micro-Computer Enabled Feeding Device"

Dharmindra Dulal - "Effects of Nonylphenol on the Development of Mosquitofish"

Morgan Bishop - "Arch Form and Function Effects on Knee Pain in Collegiate Track and Field and Soccer Athletes"

Poster Sessions

Chelsey Dietzel - "Physical and Behavioral Study of the Amazonian Freshwater Stingray"

Adaisha Cole and Lizzy Kunde - "An Interprofessional Examination of the Effects of Music Therapy and Speech Language Pathology on the Development of Play Skills in Young Children"

Nicole Diambra - "How Dance Travels: Dance in the Amazon"

Taylor Lewis - "Computational Modeling of the AS1/AS2 Complex"

Camille Hamway - "The Effects of Animal-Researcher Interaction on Brain Stress Levels in Rats"

Matt Koldewey - "Lateral Movement Changes Resulting from Training on the Better Movement Systems Suspension System Exercise Machine"

Lauren Boush - "The Effect of Physical Activity on Pain and Social Interaction in Persons with Cerebral Palsy"

Justin Archer - "Learning to Fly (with flies): The Effects of Vespa Amino Acid Mixture on Mitochondrial Defect Induced Locomotion Disorders in *Drosophila Melanogaster*"



Tayler Lewis

Tayler Lewis, Radford University
Mentor: Tara Phelps-Durr,
Associate Professor
Project: Computational modeling
of the AS1/AS2 complex

I am very excited to receive ASPB's SURF award! This summer, I will computationally model the 3-D structure of the ASYMMETRIC LEAVES 1 and 2 (AS1 and AS2) proteins in Arabidopsis. I will also clone the AS1 and AS2 genes, express them in *Escherichia coli*, and begin the process of verifying the 3-D structure of these proteins. Receiving the SURF award allows me to gain 3-D perception skills and obtain a variety of new scientific knowledge while developing my own scientific identity. Upon completion of my undergraduate biology degree, I plan to attend physical therapy school, with the hope of pursuing a career in pediatric physical therapy.

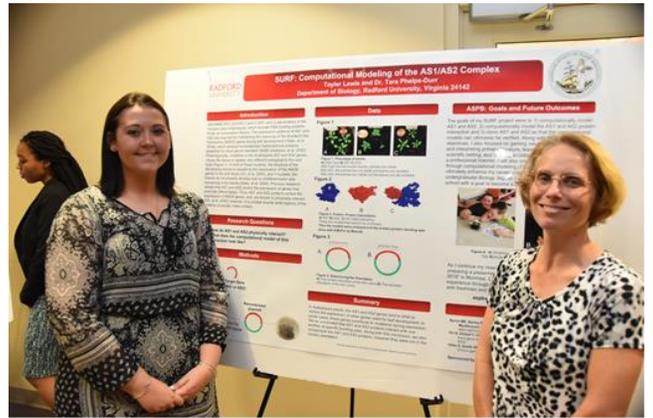
A notice about Tayler's work appeared in the ASPB journal.

Tayler Lewis, a Junior majoring in biology with a pre-health concentration, showcased her project "Computational Modeling of the AS1/AS2 Complex" during the symposium poster session.

Tayler is also a recipient of a Summer Undergraduate Research Fellowship from the American Society of Plant Biologists (ASPB) where she is documenting her work via blog.

<https://aspbsurftaylerlewis.wordpress.com/2017/06/06/week-three-it-only-takes-one/lewis-tayler-2017-06-01-conc/>

ASPB is a professional society devoted to the advancement of the plant sciences. It publishes two world-class journals and organizes conferences, and other activities that are key to the advancement of the science. Tayler will attend the 2018 Plant Biology meeting in Montreal next July.



Tayler Lewis and her faculty mentor, Dr. Tara Phelps-Durr.

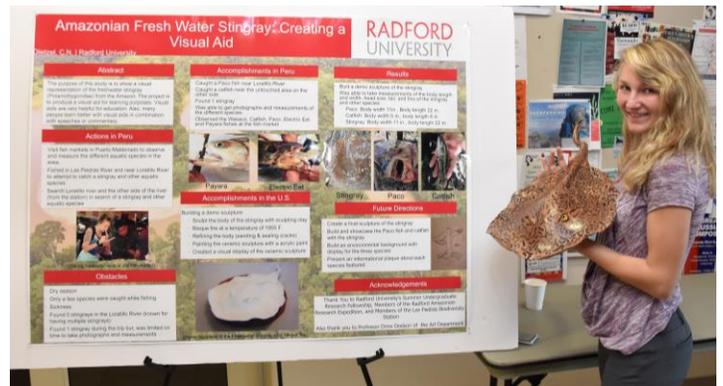
Senior Chelsey Dietzel, a biology and art major, is creating a freshwater stingray sculpture. She displayed a preliminary model of the fish at the symposium. "I'm pretty proud of this little guy," Chelsey said.

A participant in the Radford Amazon Research Expedition (RARE), Chelsey spent countless hours fishing the Las Piedras River in an attempt to capture a live stingray. Unfortunately, she said, it was the dry season, and not many stingrays could be found. In fact, Chelsey had just one thrilling chance during the three-week trip to document one. She was in the jungle, climbing a tree, when she heard someone yell they'd caught a stingray. She rushed to the water's edge where she found a RARE guide holding the fish.

"My adrenaline was rushing," Chelsey said. She carefully measured the stingray and took

photographs, then released it back into the river. She plans to create another stingray out of sculpting clay, along with two other species, and an informational plaque about each one. She will present them next semester at an art exhibit.

"Biology helps you get the research, and art can help bring that science to life," Chelsey explained. "I hope more majors will continue to participate in RARE, because it can have such a huge impact."



Chelsey Dietzel with her initial stingray model.

Students working collaboratively with faculty enhance their educational opportunities tremendously. This theme was evident during the Inaugural Celebration of Student and Faculty Collaborative Research social held on Friday, October 20 in the Joe Scartelli Atrium of the Covington Center.



Jessica Mundy.

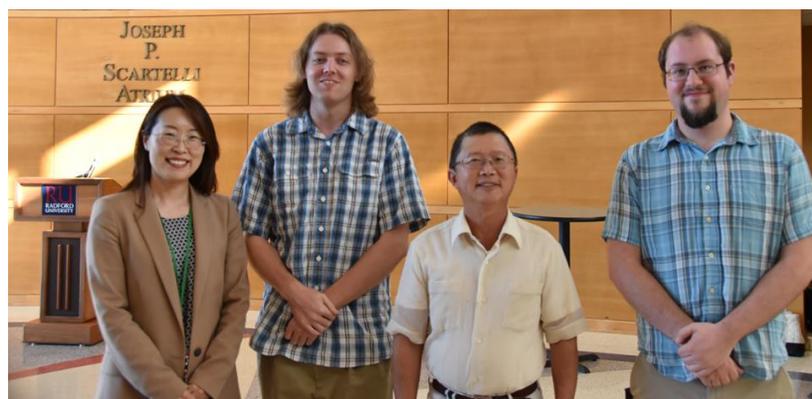
Sponsored by Dr. Joe Wirgau and the Office of Undergraduate Research (OURS) and spearheaded by Jessica Mundy, OURS Executive Student Assistant, the event was an opportunity for students to share the impact of their experiences. Jessica stated that she is grateful for the many research opportunities that she's embraced at Radford, including presenting at several conferences, being published and earning grants to further her studies.

The experience has also affected her personal growth, she said. "Because of undergraduate research, I am a completely different person," Jessica said. "My confidence has grown drastically, as well as my efficacy - my belief that I can do good things here. I've made meaningful friendships and I'm doing valuable things with my time...This institution is my home now - one of my favorite places in the world."

Connor Philson, a senior majoring in biology, stated "It is the continued support of faculty that has allowed me to do the research that I enjoy." He added "Thank you for all the opportunities undergraduate research and high impact practices have given me and all the other students. Not just the students here today, but the ones who are working on publications now, the ones who will be coming in as freshmen next year and for many years to come...We will continue to produce great publications and work and share the Radford University name in all the opportunities that are provided." Connor works with Dr. Jason Davis researching automated animal data collection centers.



Connor Philson.



Dr. Hwajung Lee, student Rory McDaniel, Dr. Chen-Chi Shing, and student Erik Miller.

Mary Hardbarger contributed to this story

REALISE PROGRAM LAUNCHES PEER ROLE MODELING OPPORTUNITY

Helping students thrive in the science environment is core to the Realising Inclusive Science Excellence (REALISE) program. One way to achieve this goal is to facilitate students helping their fellow students. To that end, a Peer Role Modeling program has been launched and is seeking student participants.

The mission of REALISE Peer Role Modeling Program is to build a community of learners among Biology, Chemistry and Physics students. Peer Role Models are students who are in good academic standing and have successfully completed at least two semesters of classes at Radford University. The Peer Role Models will organize and host a variety of social and academic events (i.e., student success seminars, Maker events, game nights, movie nights, etc.).

Being a Peer Role Model is challenging and requires dedication, perseverance and professionalism. Peer Role Models will provide guidance, support, and encouragement that fosters success of all Radford students, regardless of age, ethnicity, gender or socioeconomic status. Peer Role Models are expected to be trustworthy, have good listening skills and use good judgement when offering advice to other students.

RESPONSIBILITIES OF A PEER ROLE MODEL

- Work with faculty mentors to develop and coordinate events
- Attend Peer Role Model training/orientation
- Organize and Host Peer Role Modeling Program Events
- Attend weekly one hour peer role model meetings with faculty mentors
- Listen to other students and provide advice that fosters success
- Participate in reflection and program evaluation

BENEFITS OF BEING A PEER ROLE MODEL

- Support fellow students
- Service to the university
- Develop and improve organizational and leadership skills
- Gain real work experience
- Earn \$12/hr for 5 hours/week of service during the 15 week semester

REQUIRED QUALIFICATIONS OF A PEER ROLE MODEL

- Knowledgeable of the university community
- Personable, flexible and considerate to the needs of other students
- Willing to work in a team setting
- Willing to help fellow students make choices that help them succeed
- Completed at least 30 credit hours at Radford University
- Should have at least a 2.3 grade point average (GPA)
- Should be willing to meet the necessary time commitment of the program

PREFERRED QUALIFICATIONS OF A PEER ROLE MODEL

- Able to demonstrate excellence in a least two of the following: communication, time-management, organizational, study and problem-solving skills.
- Knowledge of student support services, degree requirements, and the MakerSpace.

The deadline for applications is December 1. Please contact Dr. Tara Phelps-Durr for more information at tphelpsdu@RADFORD.EDU

FACULTY ARE INVITED TO A REALISE MIXER ON MONDAY, NOVEMBER 6, IN HETH 022

RADFORD UNIVERSITY

Realising Inclusive Science Excellence

You are invited to a

Faculty Mixer

November 6

12:30-1:30

Heth 022

Come support your colleagues as they give lightning talks describing their Kickbox minigrant project or favorite classroom activity! A fun way to gather new ideas! Appetizers and beverages will be provided.

Please RSVP to tphelpsdu@radford.edu by November 1.

GEOLOGY ACTIVITY WITH UAV SYSTEMS, LIDAR, AND OTHER CUTTING-EDGE TECHNOLOGY CONTINUES TO EXPAND

The work of the Geology Department with Unmanned Aerial Vehicles (UAV) and Geohazards is continuing to expand.

As part of the Virginia Department of Transportation's (VDOT) work with the Virginia Department of Conservation and Recreation (DCR) at Natural Bridge State Park in Rockbridge County, Radford University is partnering with VDOT to conduct a geological analysis on the formation known as Natural Bridge. Concerns about the safety of this roadway and natural site prompted the review.



Photo of Natural Bridge from VDOT/DRC

surface photographs and enhances surface mapping,

Electrical Resistivity - measures resistivity of the material at various depths provides, which is an indication of the material type (rock, sand, air) and water content. These data provide a 2-D image of the formation subsurface for use in later analyses.

Seismic Reflection or Refraction - helps measure the density of rock and how sensitive the rock is to vibration. Vibration monitoring, geophones, or other monitoring tools - measures ground movement, such as vibration from an external source.

This testing material will be reviewed by an advisory board whose members are independent of DCR and VDOT. At the conclusion of all testing an interim report will be produced by early 2018 with the final report in spring 2018.

VDOT engineers and geologists began planning a series of non-destructive geological tests to be completed in 2017 which will help DCR develop a master-plan for the site

Dr. Skip Watts, representing the Environmental and Engineering Geosciences Program at the Department of Geology at Radford University will conduct the tests in conjunction with VDOT and DCR. Dr. Watts specializes in engineering geology and is a Certified Professional Geologist in the Commonwealth of Virginia. Dr. Watts is the past Dalton Distinguished Professor of Geology at Radford University and now heads the Geohazards Research Center.

The following are part of VDOT's geological testing and tests to be performed by Dr. Watts:

Ground Penetrating Radar (GPR) - provides 2D imaging of existing roadway layers.

Terrestrial Light Detection and Ranging (LiDAR) - provides a three dimensional representation of the geological formation's surface features.

Unmanned Aerial System Surveys - provides visual

The use of the UAV systems in this work requires support from well trained personnel. Mr. George Stephenson, Laboratory Coordinator and faculty within Radford University Department of Geology, is one of the most well-trained members of the department and he continues to pursue the latest information and technology. October 24-26, Mr. Stephenson attended the Commercial UAS (Unmanned Aerial Systems) EXPO in Las Vegas where much of the UAS industry from all over the world convened to discuss the latest trends in technology and products, and the latest rule making from the FAA.

In attendance were companies from the US, UK, Sweden, Italy, France, and Canada to just name a few. Presentations centered around using UAS (drone) technology in various industries such as Public Safety (Criminal Justice), Search and Rescue, Infrastructure Inspections, Mining (Geology), Surveying (Geospatial), and Environmental.

A common theme that Mr. Stephenson observed was that for success in these industries, details are crucial. "You must be precise, especially with logging both your flight hours, and your maintenance records of your drones," he said. "When bidding on a large drone opportunity, or even just setting up your UAS company and seeking insurance, the more complete your logbooks are really matters. They check those, and you better be caught up with them."

There were also speakers from the FAA and the DOT from Washington to help explain the recent announcement (Wednesday) of the new UAS Integration Pilot Program which may modify the current rules surrounding drone use by the public. Such an adjustment could allow for more use of the vehicles, leading in turn to more job opportunities for those with the right training. "There are many jobs currently available for FAA Certified Remote Pilots, but you also need to know what to do with your data, Mr. Stephenson stated. "Those that know what to do with the pictures, or other data acquired from the inspection or survey flights, have the best opportunity to land a good job. They are predicting over 100,000 good pilot jobs in the next few years."

New products were also a key element of the EXPO. "The Drone companies are getting sophisticated, they now offer 'Platform and Enterprise' bundles for professional use. These bundles are what the better consulting firms and large corporations are requiring in order to have a complete operation. These include multi-spectral cameras, high definition cameras, LiDar units, and one of the newest options is to have a zoom on your camera so the drone can be at a safe distance from the subject being photographed.

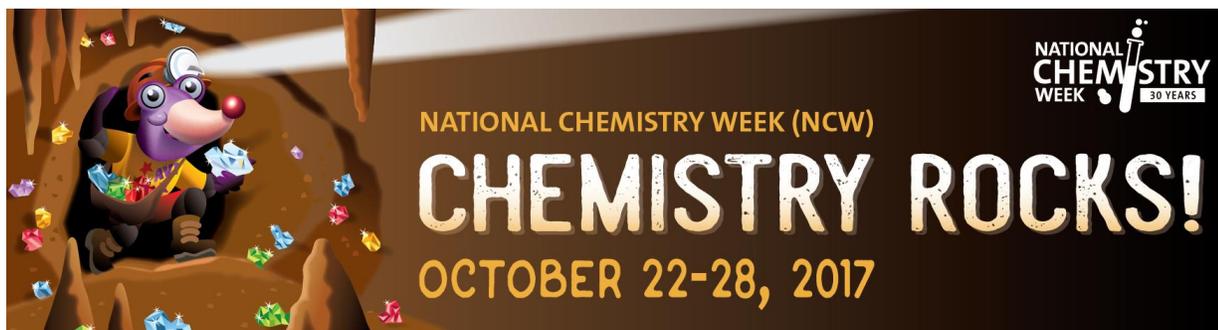
Mr. Stephenson noted "The full blown "Enterprise" packages cost from \$30,000 to \$200,000, and some cost even more." He added "You can still buy the basic drone package, but the industry is moving away from that to a more complete business model. I guess you can say the industry is maturing. Overall it is still an exciting opportunity, but more structured."



Mr. George Stephenson with a new GPS ground control point system to help increase precision when surveying with UAV/UAS (drones).

CHEMISTRY CLUB CELEBRATES NATIONAL CHEMISTRY WEEK

October 22-28 was the 30th anniversary of National Chemistry Week (NCW) and the occasion was marked on campus by the Radford University Chemistry Club. NCW encourages ACS members and science enthusiasts to build awareness of chemistry at the local level. ACS local sections, schools, businesses, and individuals are invited to organize or participate in events in their communities with a common goal: to promote the value of chemistry in everyday life. The theme was “Chemistry Rocks!”



“Monday we had an ice cream social, and all the ice cream was gone within 20 minutes,” stated Chemistry Club President Alex Hawks. We were not prepared for that many people!”

The group also featured an American Chemical Society “Program-in-a-box” Webinar , on Tuesday. “We had another great turnout with 51 people attending” Alex recalled.

Wednesday was a bake sale to help raise funds for club activities. “Many students and faculty helped either by making food for us to sell or working the table,” said Alex. “On Thursday we participated in the ‘Rad Rocks’ program by painting and hiding rocks. Since this year's National Chemistry Week theme was ‘Chemistry rocks’ we painted that phrase on the rocks and hid them around campus.”

On Saturday, the group took a field trip to Dixie Caverns.

“Overall, it was a fantastic week! We would like to thank all the faculty that helped us plan or use their facilities” said Alex. “We could not have done it without the interest and support from the students here at Radford University. We have many students from multiple majors, and it is great to see them have such an interest in what we are doing.”



National Chemistry Week Bake Sale.

The group has additional plans for the remaining few weeks of the semester. “We hope to have another chemistry bowling night, and potentially, a Christmas party” Alex stated. “We also want to do some more community outreach.

NEW UNDERGRADUATE STUDENT JOINS DAIM MASTERS PROGRAM

Seventeen year-old Nalani Story, a first-year honors student at Radford University, has been accepted into the Data and Information Management Master's Program accelerated track.

This will allow Story to map out her college career and complete both an undergraduate and graduate degree in just four years.

"We identified undergraduate applicants who appeared most likely to succeed in the DAIM program based on high school performance," explained Dr. Jeff Pittges, DAIM Graduate Coordinator. "We invited our top choices to join the accelerated track."

Students enrolled in the accelerated track may complete up to four graduate level courses during their senior year. This expedited track enables students to earn their master's degree one year after they finish their bachelor's degree.

Story, who will earn her masters at the age of 21, couldn't be more excited. "I never dreamed I'd be planning my graduate degree as a sophomore at Radford," Story said.

Born in Hawaii, where she lived until she was four years old, Story traveled with her family around the world to Okinawa, Japan before settling in Fredericksburg, Va. in 2007.

When arriving at Radford, Story had no problem adjusting to the campus or classes. "Finding friends in my major and balancing work with my new college life has been fun for me. The honors professors and my resident assistants have been encouraging and have made the transition smooth," Story said.

Although Story is a first-year college student, she is considered as a sophomore due to her transferred credits from high school. Story attended Stafford Senior High School where she completed advanced placement courses and the dual enrollment program through her local community college.

During her time as a high school student, she took three programming classes. Two of the classes were Java based and one focused on Visual Basic and game maker.

Although Story is stressed with preparing a schedule for her classes, she is thankful that there has been faculty supporting her along the way. "Dr. Pittges has dedicated himself as my mentor, he has been a great support while figuring out my schedule," Story said.

One of Story's favorite aspects of the DAIM program is the Applied Research in Technology and Information Science Lab. The ARTIS lab is a high-tech collaborative workspace where students can work closely with faculty and industry partners to solve real problems.

"I enjoy having access to the ARTIS lab, I'm an absolute recluse and like having a special place to work on assignments and relax," Story stated.

By her second week on campus, Story had already learned a key to success, "If you show initiative, faculty will assist students with their struggles," stated Story. "Connect with professors, they want you to succeed and are here to help you."

Story by Emily Lewis



CROWDFUNDING PROJECTS LAUNCH

Crowdfunding has become a popular way to garner financial support for worthy activities in a designated time frame. Radford University launched a crowdfunding platform known as “the Hive” in the spring of 2017 and the Artis College fielded a successful campaign to support the Summer Bridge program. This fall, two additional programs are featured with more in the fundraising pipeline.



Administered by the Office of University Advancement, “the Hive” allows the university's students, faculty and staff to create and share approved fundraising projects with their networks and an engaged community. Those interested may submit their project for review and approval in order to be featured on the platform.

Once approved for a fundraising project, project leaders meet with University Advancement staff to learn how to operate the platform and how to build the content for their page, along with best practices for effectively fundraising via “the Hive.”

Fall project: **RARE: Help Our Students Experience the Amazon – led by Dr. Stockton Maxwell, Associate Professor of Geospatial Science.**

Beginning in May of 2015, the Radford Amazonian Research Expedition (RARE) has provided undergraduate students with a unique opportunity to conduct original research in a primary Amazonian rainforest ecosystem. Under the supervision of Radford University professors, a group of selected students from multiple disciplines spends three weeks learning and exploring deep in the Peruvian jungle.

Help us continue to make this experience possible for our phenomenal students with your gift today!

As a faculty member who has participated in the RARE experience, I can tell you that it's the coolest way you can teach. To take students out there and see them problem-solving, working through issues and dealing with adversity in the environment - it's just amazing. For me, that has been so rewarding, and that's what makes my job as an educator worthwhile. I encourage you to give today to continue to make this opportunity available to our students!

"This trip will challenge you in ways you never expected. It tests your mental and physical strength. It will make you better and change you in ways you never anticipated. It gave



RARE 2017 team at Machu Picchu

me new perspective on myself and on the world. I can honestly say I am a better person because of it." - Rachel Sharrett, Student

The RARE trip is a life-changing opportunity for students from all areas of study. Participants have included majors in biology, anthropology, geospatial science, psychology, sports medicine, criminal justice, nursing, dance and computer science. Moving forward, many others disciplines may be added.

We need your help to ease the financial burden for students participating in this unique and extraordinary study abroad opportunity. Your support will help us expand their perspective of original research, explore exotic terrain, serve those who call the jungle home and develop new knowledge with each other and faculty.

Learn more at https://connect.radford.edu/thehive?cfpage=project&project_id=16382

Fall project: Send Radford University students to the USA Science & Engineering Festival – led by STEM club President Collier Crisanti

The USA Science and Engineering Festival represents the nation's largest celebration of science and engineering. This expo boasts 375,000 attendees, including K-12 students and their teachers, families, government officials and the press. This event gives Radford University students the unique opportunity to push their learning experience beyond the classroom, network with more than 1,000 other science, technology, engineering and math (STEM) organizations, educate the public about the wonders of STEM, and showcase their own innovative projects.

One of Radford University's past award-winning interdisciplinary science teams presented its work on a sustainable water purification project during the U.S. Environmental Protection Agency's "People, Prosperity and Planet (P3) Sustainable Design" session, later receiving an EPA grant to develop its research.



Radford University Students at the 2016 USA Science and Engineering Festival

Thousands of festival participants visited the Radford University booth in 2016. With your help, we can surpass that effort in 2018. Make your gift today to send our students to the 2018 USA Science and Engineering Festival!

Following the festival, the displays created with your support will also be used on campus and regionally as part of STEM outreach. In addition to Radford University students sharing their research and experiences with the world, the event is a fantastic opportunity for them to explore exhibits by organizations such as NASA, SpaceX, the National Institutes of Health, Lockheed Martin and build opportunities for networking and internships!

We need your support to continue to provide this transformational experience for Radford

University science students!

Please consider a gift today! Learn more at https://connect.radford.edu/thehive?cfpage=project&project_id=16867

DR. TRACY LEWIS-WILLIAMS FEATURED AS RADFORD CELEBRATES WONDER WOMEN DURING HOMECOMING

Radford University alumni and friends gathered to celebrate strong and determined women during the Women of Radford Luncheon.

Close to 150 Radford University alumni and friends celebrated strong and determined women during the Women of Radford Luncheon on Saturday, October 7 at noon in Kyle Hall.

Keynote speaker Dr. Tracy Lewis-Williams, a faculty member in Radford University's Department of Information Technology and the first African American woman to earn her Ph.D. at Virginia Tech in computer science, discussed how the audience should embrace their inner wonder women.

She discussed the women who inspired her to follow her dreams in computer science such as black female mathematicians Katherine Johnson, Mary Jackson and Dorothy Vaughan who helped NASA launch John Glenn into space during the 1960s space race. Dr. Lewis-Williams also mentioned her mentor Christine Salter, who taught in Radford University's information technology department and collaborated on projects with then Ph.D. student Lewis-Williams.

While working with Ms. Salter, Dr. Lewis-Williams once told her "I want to be just like you," because Salter was such an inspiration to female computer science students and to Dr. Lewis-Williams. Salter dedicated 30 years to the field of corporate information and technology, and encouraged young women to follow in her footsteps to break barriers for women in the field. "I am still teaching at Radford because of Christine Salter," said Dr. Lewis-Williams.



Dr. Tracy Lewis-Williams addressing the Women of Radford Luncheon with her telepresence double robot standing guard at the front of the podium.



Radford University alumni and friends gathered to celebrate strong and determined women. Georgia Anne Snyder-Falkinham, member of the Radford University Board of Visitors and Radford University Foundation and Nancy Artis '73, Vice-President of the Radford University Foundation were among the many alumni from across the decades attending the Women of Radford Luncheon.

Dr. Lewis-Williams also honored beloved alumna and event attendee Nancy Artis '73 for her generosity and dedication to her alma mater and the Artis College of Science and Technology. She said when Nancy visits her classes, she brings solid advice from corporate America and a glimpse into the "real world." Last spring, Nancy and Pat Artis gifted the university the largest contribution by an individual and an alumnus in Radford's history. The Artis College of Science and Technology was dedicated, and the Artis Endowed Scholarship Fund will award 67 high-achieving students scholarships in the amount of \$3,000 based on academic eligibility.

Another of the many wonder women in the room, Margorie A. Young '85, DNP '15 spent 30 years working in women's health before becoming a faculty member in Radford University's School of Nursing. She served as the Director of Women's Health Services and the Director of the Birthing Center at LewisGale Montgomery Hospital in Blacksburg. She said she loves to be inspired by Radford women. "I love to hear women's stories of where they've been, what they've done and what they want to do. It's inspiring!" said Young.

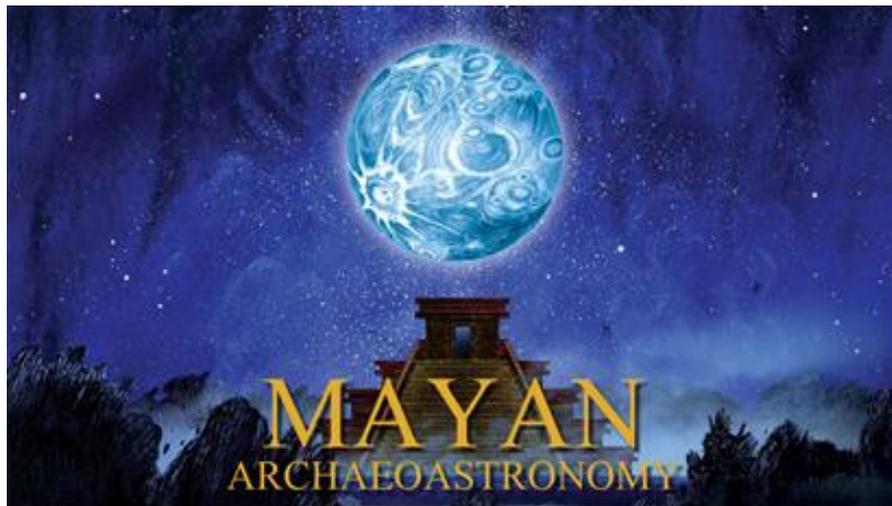
During Dr. Lewis-Williams' presentation, she discussed the tools the traditional DC Comics' Wonder Woman used and how they could be symbolically used by the wonder women in the room. The invisible plane is a symbol of striving for work-life balance; the magic sword shatters the glass ceiling, while women strive to reach their dreams; the deflective bracelets help deflect conflict or personal attacks; the lasso of truth illuminates their own truth and honesty about their own abilities; the royal tiara helps them know their value; and the body armor provides confidence. "We are all wonder women!" she said.

Story by Ann Brown

PLANETARIUM SHOWS HIGHLIGHT MAYAN TEMPLES AND THE HISTORY OF CONSTELLATIONS

From October 31 through November 15 The Radford University Planetarium will continue offering several shows each week.

On Tuesdays and Thursdays at 7pm, the featured show is "Mayan ArchaeoAstronomy: Observers of the Universe" shows how the Mayan temples were actually observatories that were critical to the lives of the Mayan civilization. The stars and planets became their calendar for floods, feasts, and wars. The messages they read in the stars guided all aspects of their lives. The show takes viewers on a tour of 6 Mayan temples – San Gervasio, Chichen Itzá, Uxmal, Edzná, Palenque and Bonampak – where the spectator dives into a Mayan world of knowledge about the importance of the orientations of its temples in relation to the movement of some stars like our sun, our moon and Venus.





The Tuesday and Thursday afternoon 4pm shows will not only feature a tour of the sky, but will also feature the full dome show “History of Constellations.” Come see the original 48 constellations, and then the addition of others to fill in the southern sky. This program discusses how the constellations change with time as our own location in our galaxy changes. This full dome show was produced by friend-of-the-planetarium Dr. David Wright at Tidewater Community College, and features original music by Mark C. Peterson of Loch Ness Productions.

The Saturday 10:30am kids shows will take audiences on a tour of the nighttime sky, featuring beautiful kid-friendly artwork, a new/old story about the “rabbit in the moon” according to an old legend from India, and the full dome show “Space Shapes.” Come join us for this family-oriented event.



There will be no shows from Saturday, November 17 through Sunday, November 26 while Radford University is closed for Thanksgiving. After that break, shows will resume on Tuesday, November 28 and will include the seasonal show “Season of Light,” always a hit during the holiday season.

Shows in the Planetarium are free, but seating is limited. It is recommended to arrive at least 30-45 minutes prior to show times to help ensure entrance. Groups are strongly encouraged to contact the Planetarium Director Dr. Rhett Herman, rherman@radford.edu. Special shows may be arranged for groups of at least 20 based on availability.

Please enter the Center for the Sciences on the Main Street Level Parking Lot C to visit the Planetarium

Hearing-assist receivers are available for our sound system--please bring your own earphones (1/16 inch [3.5mm] stereo jack). No food/drinks allowed in the planetarium

For more information please visit www.radford.edu/planetarium

PARTNERSHIPS POWER STEM EXPERIENCE

Each year, scores of young women venture to Radford University on a journey of discovery in STEM education. They come from across Virginia, around the US and from several countries around the world to immerse themselves in science and technology. Many have called it a life-changing experience and none of it would be possible without key partnerships from businesses, foundations, and individuals.



Members of BAE Systems Radford Army Ammunition Plant team and Summer Bridge Students.

The Summer Bridge program, sponsored by the Artis College of Science and Technology is a week-long, residential STEM experience on the Radford University campus held each July. Founded over a decade ago, the idea was to help bridge the gap in STEM participation among women and to give them an opportunity to explore new possibilities in a supportive and welcoming environment. More than 500 girls have taken advantage of this experience, many continuing in science related fields as they move forward to college.

The program is fully funded through gifts and grants from private partners who recognize the value of encouraging women to pursue STEM fields. According to UNESCO statistics, when averaged across regions, women account for less than a third (28.4%) of those employed in scientific research and development (R&D) across the world. Industry has a need for more women in the STEM workplace.



BAE Systems team members leading in-class experiments with Summer Bridge students.

The lead partner for Summer Bridge in 2017, BAE Systems, not only provided scholarships for ten students, but also took an entire afternoon to share their work with participants through presentations, discussion, and hands-on experiences. Led by Chris Finley, Communication Manager for BAE at the Radford Army Ammunition Plant, a team of women from across the company's businesses at the facility shared their responsibilities and career paths with the students.

Following an overview of the company and the many potential career paths available with STEM related degrees, the BAE Systems team worked with students in small groups to give them a personal experience related to their work. "I never realized that a chemistry degree would be so valuable in a business like this" stated one of the students. "It helps shine a whole new light on the

possibilities."

To enhance the experience, the group participated in a brief Viscosity Study and Industrial Hygiene Show-and-Tell, elements that are key to the work at the Radford facility. In a nod to the plant's history as a propellant manufacturer, the students had a table-top exercise creating paper rockets that were thrust by the force of an Alka-Seltzer tablet and water.

"In addition to helping the girls participate through scholarships, BAE Systems is greatly enhancing our program through this type of experience" stated Summer Bridge Director David Horton. "We could not be more appreciative for their support and participation as a sponsor and partner."



Summer Bridge students exploring the Novozymes Salem Facility.

Long-term Summer Bridge partner Novozymes Biologicals also supported scholarships for several girls and hosted a group at their Salem facility for tours and hands-on experiences. "Continued support from our donors is what has allowed our program to grow over the last few years in both stature and student interest" stated Dr. Orion Rogers, Dean of the Artis College of Science and Technology. "When prospective students learn that they will have the opportunity to visit a branch of an international organization to learn about their work and career opportunities, they quickly realize that this is more than a classroom exercise."



Students participating in experiments at the Novozymes Salem facility.

A team of Summer Bridge students traveled to Lynchburg as a part of their experience to visit the AREVA technical training center and learn more about how reactors operate and what types of career paths can be found within that field.

Organizations such as the Lynchburg Community Trust and the Harry and Zoe Poole Foundation have also helped many girls from regions across Virginia participate in the program. Their support of scholarships provides funding for participants from their regions to engage in the week.

Individuals give of their time and treasure to round out the program. Dr. Donna Boyd and Dr. Cliff Boyd not only serve on the faculty for Summer Bridge, but sponsor students to participate as well. In 2017, more individuals than in previous years stepped up to support the program as Summer Bridge was part of the inaugural Radford University crowdfunding initiative entitled "Spring Fever" where more than \$3,000 was raised for girls' scholarships.

More than \$80,000 is needed on an annual basis to allow this STEM experience to take place. Partners are essential to reaching that goal and to enhancing the program in many additional ways. Summer Bridge 2018 is scheduled for July and applications will be accepted beginning in December.