

FROM THE DEAN'S DESK – November 28, 2017

THE RADFORD UNIVERSITY ARTIS COLLEGE OF SCIENCE AND TECHNOLOGY NEWSLETTER



Students and faculty participated in the annual meeting of the Virginia Branch of the American Society for Microbiology in November.

Attendees included (from left to right): Colin Semple, Kelly Hodges, Daniel Harrison, Dr. Georgia Hammond, Kendalyn Hersh, Dr. Joy Caughron, Dr. Justin Anderson, Charles Branscom, and Josh Tulppo. Photo courtesy of Dr. Robert Hersh.

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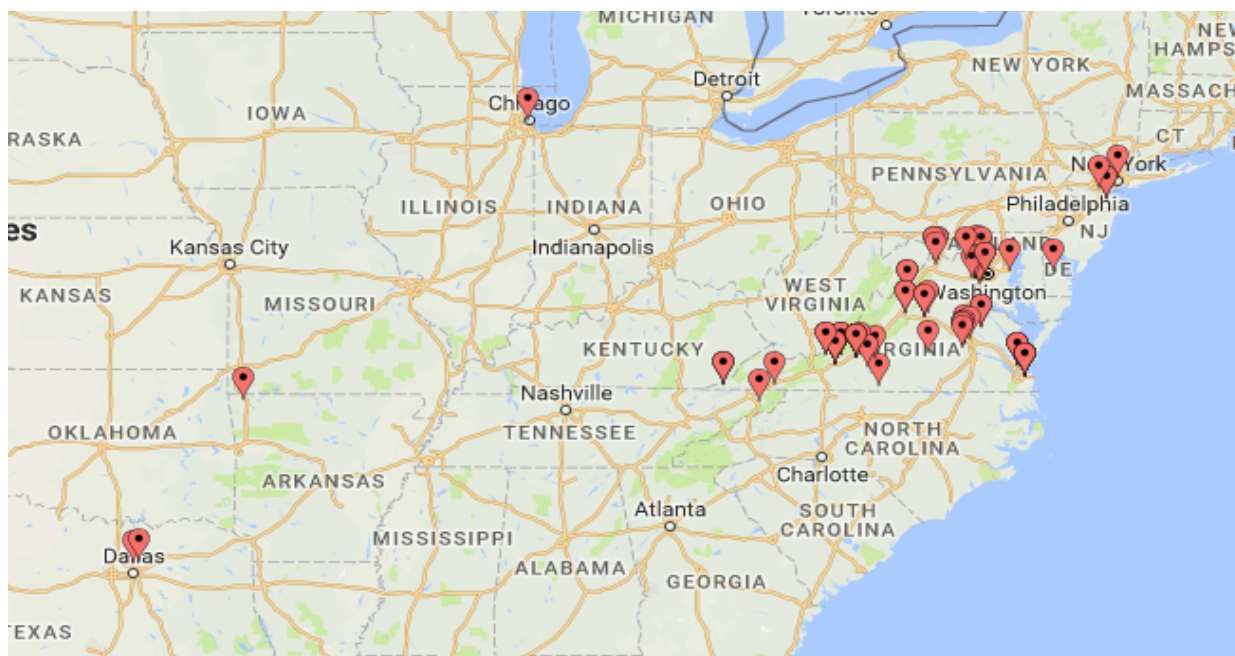
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FALL PRELIMINARY ROUND OF RU SECURE CONTEST LAUNCHES WITH RECORD PARTICIPATION

The 2017 edition of the RUSecure Capture The Flag contest is underway and is experiencing a record number of competitors. Dr. Joe Chase, Professor of Information Technology and co-director of the contest stated that this increase is likely due to “strong word of mouth advertising.” He added “I believe we have the opportunity to continue to grow the contest as more school systems and families become aware of the need and opportunities for cybersecurity professionals.”

To date, 123 teams with more than 500 students total are competing in the contest; an increase of more than 55% over the 2016-17 contest.

Sponsored by the Radford University Department of Information Technology, this annual event challenges, motivates, and educates the hundreds of high school and community college students who participate. For those teams who make it all the way to the finals, a Radford University scholarship is the prize at the finish line!



Students from across the US are participating in the RUSecure Preliminary Round.

The students competing for these scholarships represent 55 separate high schools and community colleges. Some cities have multiple schools participating and some schools have several teams. While most groups are based in Virginia, there are several states represented including Texas, Arkansas, Connecticut, and Maryland.

“This program helps students hone their cyber defense skills and knowledge, helping them prepare for the next phase of their education,” stated Dr. Chase.

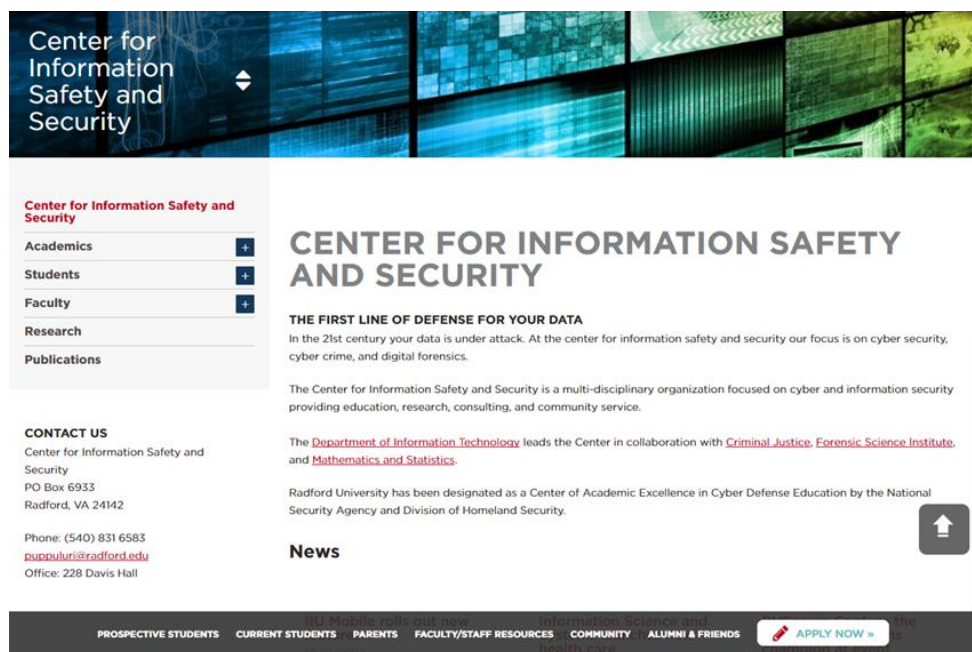
The contest, co-directed by Dr. Chase and Professor of Information Technology Dr. Prem Uppuluri, has a fall component which will run over the next two weeks, then a Qualifying Round in the spring before concluding with the on-campus Finals in April.

This program is just one of the many ways that Radford University is leading the way in cyber security education. Learn more at <http://www.radford.edu/content/csat/home/information-security.html>

CENTER FOR INFORMATION SAFETY AND SECURITY RELEASES NEW WEBSITE

In the 21st century your data is under attack. Nearly every day there is a new story about a system being compromised and individuals and organizations put at risk.

The Center for Information Safety and Security at Radford University is a multi-disciplinary organization focused on cyber and information security providing education, research, consulting, and community service. To better serve students, faculty, and people seeking more information about Information Security, the Center has created a revamped website with links to courses, research, and opportunities for those interested in learning more about this ever growing field.



Radford University has been designated as a Center of Academic Excellence in Cyber Defense Education by the National Security Agency and Department of Homeland Security.

The Department of Information Technology leads the Center in collaboration with Criminal Justice, Forensic Science Institute, and Mathematics and Statistics and is under the direction of Dr. Prem Uppuluri, Professor of Information Technology.

New Information Safety and Security website.

The new website is available at:

www.radford.edu/content/csat/home/information-security.html

Utilizing a tagline stating that the center is “THE FIRST LINE OF DEFENSE FOR YOUR DATA,” future components of the site will include sample tests, contests, and more tools for those interested in pursuing the field.

RADFORD UNIVERSITY BIOLOGY MAJORS ATTEND MICROBIOLOGY CONFERENCE

Six biology majors attended the annual meeting of the Virginia Branch of the American Society for Microbiology in Norfolk, VA on Nov. 3-4. The conference was hosted by Eastern Virginia Medical School (EVMS), so it was a great opportunity for those interested in medical school to interact with EVMS faculty on location. All student attendees presented posters and, in a couple of cases, were authors on multiple posters presented. Students presenting posters received review from attending professors and many positive comments. Radford University was very well represented by these young professionals.



Attendees included (from left to right): Colin Semple, Kelly Hodges, Daniel Harrison, Dr. Georgia Hammond, Kendalyn Hersh, Dr. Joy Caughron, Dr. Justin Anderson, Charles Branscom, and Josh Tulppo. Photo courtesy of Dr. Robert Hersh.

The conference included oral presentations from clinical, governmental, and academic scientists as well as industry professionals. This was an excellent opportunity for students to gain exposure to the scholarly breadth within the field of microbiology. During special sessions on Saturday, students attended a skills training session on grants and fellowships, while faculty were busy sharing information and experiences with CURES (course-based undergraduate research experiences).

Friday evening, all were treated to a talk by the American Society for Microbiology distinguished Waksman Foundation Lecturer Dr. Melanie Mormille from Missouri University of Science and Technology titled "Because of Soap Lake: Reflections on the lake's impacts on lab and beyond."

Dr. Mormille specializes in environmental biology and extremophiles. It was a fascinating and winding tale of how students following their passions have contributed to our understanding of a pretty unique and relatively extreme microbial environment, discovering a fascinating array of biochemical processes, some of which have led to patents.

Posters presented:

"A Comparative Study of Antimicrobial Activity of Sangre de Drago with Respect to Age of Specimen"
Kendalyn N. Hersh*, Joyce E. Caughron, Jason E. Davis, and Jared J. Caughron

"Developing a Model Examining the Effects of Bacteriocins on Bacterial Metabolism of Arsenic"
Colin Semple* and Georgia Hammond

"Microbial Gene Expression of Arsenate Reductase in Bacteria Isolated from an Arsenic Mine"
Charles C. Branscom and Georgia Hammond

"Effects of Phenazines on Viruses and Mosquitoes"
Melissa Kesterson, Kelly Hodges* and Justin R. Anderson

"Determining the Effect Endocrine-Disrupting Chemicals have on La Crosse virus replication in Vero Cells"
Daniel Harrison*, Josh Tulppo, Ben Thiss and Justin R. Anderson

"Endocrine-Disrupting Chemicals Affect Development of Mosquito Reproductive Morphology"
Ben Thiss, Josh Tulppo*, Daniel Harrison and Justin R. Anderson

STUDENTS SALVAGE NATIVE MUSSELS AT CLAYTOR LAKE STATE PARK

Students from the RU chapter of The Wildlife Society (RUTWS) joined a group of over 50 volunteers to assist in saving native mussels at Claytor Lake State Park. Every two years, AEP lowers the lake level to allow residents to clean off their docks and piers on the lake. This year, the drawdown was about 5 ft below the normal lake level, lower than it's been in about a decade. This exposed a vast number of native mussels that help to filter organic material and sometimes pollutants from the water.



RUTWS chapter president, Kristy Clark, holds a handful of native mussels that she is about to return to the water



Volunteers at Claytor Lake.

On this cold Saturday in November, students spent several hours collecting live native mussels from the muddy banks and returned them to the lake. In sum, they returned 783 live mussels back to the water. This was a great experience for the students to collaborate on this project, which brought together several state agencies (VDGIF, State Parks), schools (RU, Virginia Tech, Pulaski County High School), and volunteer organizations (Virginia Master Naturalists, Friends of Claytor Lake).



Kristy Clark showing some of the native mussels that were recovered.



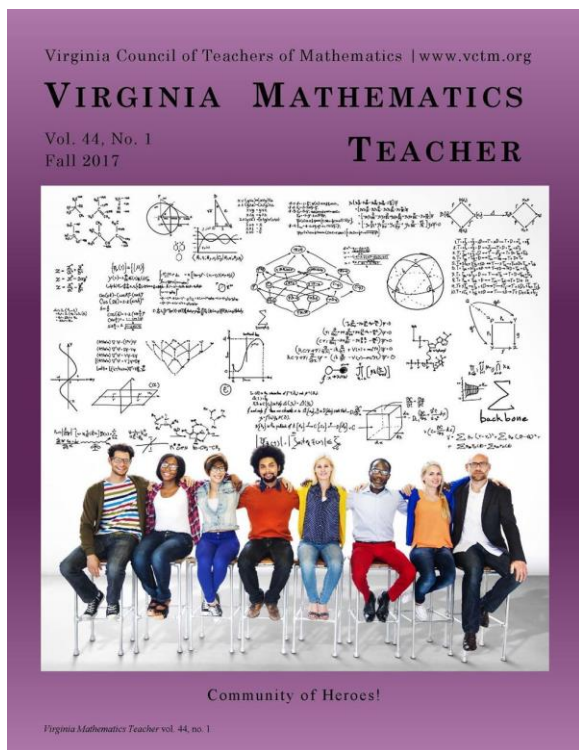
RUTWS member Mac Landwermeyer pitches mussels safely back into the water

VIRGINIA MATHEMATICS TEACHER JOURNAL SELECTED FOR 2018 PUBLICATION AWARD

At its November 2017, meeting the National Council of Teachers of Mathematics (NCTM) reviewed and selected the Virginia Mathematics Teacher journal for the 2018 Publication Award for Outstanding Journal.

Congratulations were issued to all involved with special recognition for Editor-In-Chief Dr. Agida Manizade and Associate Editor Dr. Jean Mistele, both of the Radford University Department of Mathematics and Statistics, for their diligent work in making this journal a big success.

Over the past two years since Dr. Manizade took over as Editor-In-Chief, subscribers to the journal have noticed improvements that have enhanced the magazine and provided value to readers. The number of readers has doubled since 2015.



The Fall 2017 edition of the Virginia Mathematics Teacher Journal.

“The goal of the Virginia Mathematics Teacher is to motivate both teachers and students” said Dr. Manizade. “We want to provide information to teachers, but also to share content interesting to their students. Our goal is to increase pedagogical knowledge and mathematics knowledge of teachers in the Commonwealth. However, without contributions by many talented authors, devoted external reviewers, and our exceptional editorial team this wonderful publication would not be possible. We are thankful to our community of heroes, mathematics educators, involved in the process of creating the VMT journal.”

As a part of this effort, she and her team made an intentional effort to present all original material that included more content and more current information relevant to her readers. “We conducted an informal survey among our colleagues as to what they would like to see and have been able to incorporate these ideas into the journal. We continually engage Radford University graduate and undergraduate students in development and delivery of the content for the VTM. In addition, we created a new on-line version of the VMT journal” says Dr. Manizade.

In addition to articles geared toward Mathematics teachers in the classroom, journal features have included information about contests and competitions, puzzles, technology reviews, and more.

“We attempted to make the VMT informative and fun” said Dr. Manizade. “Our goal was to find an effective balance between mathematics content and effective pedagogy. I think we have achieved it.”

The Virginia Mathematics Teacher is a peer reviewed journal and is this year is considered to be the top state-level journal in the US.

"How information can be applied in the classroom is the driving philosophy" said Dr. Manizade. "The VMT is a big undertaking, but to hear so many great things about the journal from teachers and peers makes it worthwhile. Our editorial team is working hard in order to make VMT to be something people look forward to and can't wait to read."

As winner of the 2018 Publication Award, VMT editors will receive recognition at the 2018 Delegate Assembly.

CYBERSECURITY STUDENT RISES TO NEW HEIGHTS

Radford University sophomore Kyle Higginbotham's high school teacher once assigned him extra work due to his speedy completion of class assignments. Higginbotham, 18, thought of this to be busy work, until one evening after school he completed a school project for the first time on his own time. Higginbotham's teacher instructed him to compete in [Radford University's Capture The Flag \(RUCTF\) contest](#). This is when Higginbotham realized his passion.

"I was never the one to do homework outside of school but this quickly changed," he said. "I was never challenged by any work and I thought most of it was easy, but not the Capture the Flag competition. There were problems that I would be stuck on for hours at a time but nothing would beat the joy of finally solving the problem."



Kyle Higginbotham

RUCTF, a five-week virtual contest, provides opportunities for high school and community college students to participate in cybersecurity challenges. The purpose is to educate, motivate and reward students interested in cybersecurity. The contest challenges students in a wide variety of areas including anatomy of an attack, introduction to networking, cryptography, forensics, web security and Windows/Linux security. Scholarships are offered to all finalists based upon placement in the contest.

Higginbotham is on track to graduate in 2020 with a bachelor's degree in cybersecurity and plans to apply to Radford's [Data and Information Management \(DAIM\)](#) program shortly thereafter. After graduating with his master's degree, Higginbotham desires to obtain a career with the government or a well-known business working with cybersecurity.

Higginbotham is a sophomore at Radford and is originally from Pembroke. His only experience with information technology before entering college was hardware information technology (IT), in which he took courses at New River Community College during his high school career.

Although spending time at the university and competing in the contest sparked his interest in IT, computers have always held Higginbotham's attention. "There was always something there that just clicked with me and technology. It was never hard for me to understand and learn how computers worked," he said.

The college environment was easy for Higginbotham to adjust to with the help of his Radford University professors. "Forming a relationship with some of the professors is one of the best things that happened to me," he said. "You can tell they want you to succeed and they will do their best to help you in any way they can."

Higginbotham's favorite aspect of the cybersecurity program is problem-solving. His explanation of why he chose Radford favored relationships with professors and the atmosphere of the campus. "The class sizes are small so there is more of a student-teacher bond," he said. "You aren't just a number at this university. The community is also very supportive, helpful and friendly."

TWENTY-THREE AND ME VISITS CAMPUS

This fall, students in Dr. Bob Sheehy's BIO 231 class are learning more than they imagined about their genetic past including ancestry, potential association with diseases, and much more as they utilize the services of the company "23andMe."

23andMe is a privately held personal genomics and Biotechnology Company based in Mountain View, California and is named for the 23 pairs of chromosomes in a normal human cell. Its saliva-based direct-to-consumer genetic testing business was named Invention of the Year by Time magazine in 2008.

Joining the class on November 9th was Dr. Thao Do, the Education and Academia Program Manager at 23andMe. Dr. Do received her Ph.D. in Biomedical Sciences from NIH and University of Oxford following her B.S in Mechanical Engineering from Virginia Tech.

During her presentation, Dr. Do described how the 23andMe process works where they can break down components of DNA to provide five different reports: Ancestry, Carrier Status, Genetic Health Risks, Traits, and Wellness.

Dr. Do also discussed how participants can opt into research. The company considers this to be a real asset for all original knowledge as it can eliminate the barrier of geography and other participant selection biases.

"We can filter the answers based on our questions to aid in the research with DNA," stated Dr. Do. She added "There is an artistry to asking these questions to gain information along with the saliva-based study."

85% of 23andMe customers consent to research and have answered more than 850 million questions.

Dr. Do also stated that "this model allows us to study rare diseases that most researchers will never study because they cannot get enough funding." With that in mind she continued "Drug testing and development using genetics are 1.5 times more likely to succeed."

Joining Dr. Do was Jonathon Prince, an international runner and motivational speaker who is sponsored by 23andMe in his cross-country trek. As a visionary "Athli-vist" (athlete-activist), Mr. Prince has run over 8,000 miles through 24 states, inspiring hope and raising awareness for his philanthropic endeavors. He is sharing his discovery of his heritage through the use of 23andMe, with groups such as Dr. Sheehy's class to champion unity, hope, respect and love for Americans and its global neighbors.

"The times call for people to realize we are more alike than different and we all have potential to create shining moments that exemplify our highest selves and create the kind of world we all deserve to live in," he stated. "I just want to do something that gets people to think about that".

Dr. Do concluded her presentation discussing career opportunities and offered the students present some advice for the interview process.

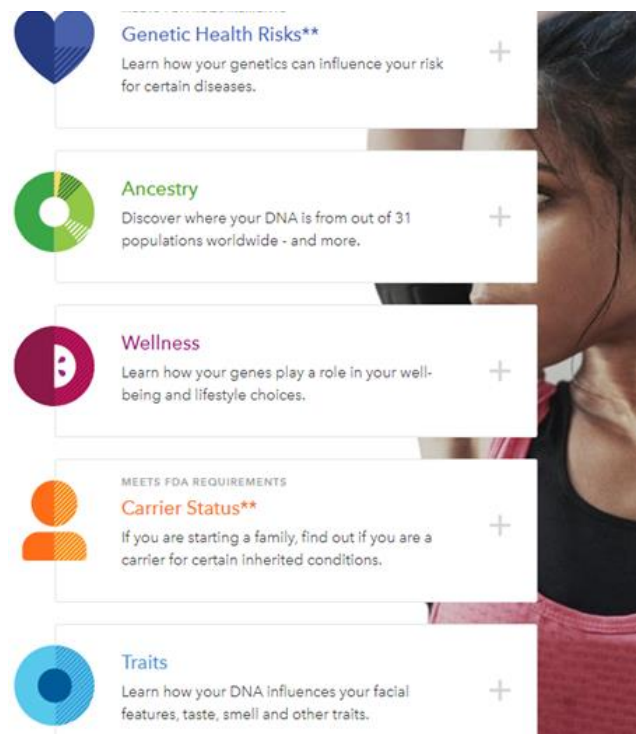


Illustration of the reports provided from the saliva sample analysis at 23andMe.

SUMMER RESEARCH OPPORTUNITIES

Now is the time that summer research programs are announcing their 2018 deadlines! The Institute for Broadening Participation organization has 699 summer research programs posted on their web site currently and are posting new program dates and new programs every day!

At the following link students can find summer research listings:

http://pathwaystoscience.org/programs.aspx?descriptorhub=SummerResearch_Summer%20Research%20Opportunity

Students will be able to find:

- 57 summer science exposure programs for high school students
- 607 PAID summer research programs for undergraduates
- 30 PAID summer programs for post-baccalaureate students (including graduating seniors)
- 56 PAID summer programs for graduate students

For even more search options and filters, try the advanced search page:

<http://pathwaystoscience.org/programs.aspx?adv=adv>

The mission of the Institute for Broadening Participation is to increase diversity in the Science, Technology, Engineering and Mathematics (STEM) workforce. We design and implement strategies to increase access to STEM education, funding, and careers, with special emphasis on reaching and supporting individuals from underserved communities and underrepresented groups, including underrepresented minorities, women, persons with disabilities, first generation college students, and students from underserved communities.



If students need help finding programs that fit their interests, please email Liv Detrick, Senior Advisor at ldetrick@ibparticipation.org

www.PathwaysToScience.org

Follow them on Facebook: <https://www.facebook.com/Pathways-to-Science-120825625433/>

NEW 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.

BLUE RIDGE HIGHLANDS REGIONAL SCIENCE FAIR:

Hosted annually at Radford University, the BRHRSF serves students (6th – 12th grade) in the counties of Bland, Buchanan, Carroll, Dickenson, Giles, Grayson, Lee, Montgomery, Pulaski, Russell, Scott, Smyth, Tazewell, Washington, Wise and Wythe, and the cities of Bristol, Galax, Norton and Radford. These students compete for cash awards and prizes, and the chance to compete at the state and international level.

Yearly expenses total approximately \$16,000. These funds are used to reward participants with trophies, ribbons and cash prizes. In addition, the top two senior division projects, along with their project sponsors, win an all-expense-paid trip to present their project at the Intel International Science and Engineering Fair (ISEF), held alternately in Phoenix, Arizona, Los Angeles, California, and Pittsburgh, Pennsylvania.

Please help us support the brightest students in Southwest Virginia by donating today!

https://connect.radford.edu/thehive?cfpage=project&project_id=18091

Society for Integrative & Comparative Biology:

Radford University provides us students unique opportunities for self-driven scientific research. With guidance from our faculty mentors in the Department of Biology, we get to think, design and perform the research, and best of all, we have the opportunity to present our research. The (SICB) holds an annual international meeting where students at all levels and faculty from across the world come together to present research and share ideas! For the fourth year in a row, we will be sending 11 undergraduate students to this year's conference to present their research, the most of any undergraduate-focused institution!

Please consider a gift today to help offset the cost of travel so our students can present their research and represent Radford University internationally!

https://connect.radford.edu/thehive?cfpage=project&project_id=17382

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.”

'TIS THE SEASON AT THE RADFORD PLANETARIUM

An annual tradition at the Radford University Planetarium is the show from Loch Ness Productions, " 'Tis the Season" which describes the legends associated with the stars that appear during the Christmas season, including the Star of Bethlehem, Saint Nick and his various forms, holiday lights and candles.



Presents and festivals are also explored in this festive show. A sky tour prior to the show discusses the more prominent stars and constellations of the season, and why the sky played such a prominent role in their lives.

This 35-minutes show is narrated by Noah Adams of NPR's "All Things Considered." This show will begin on Tuesday Dec 9 at 7:30pm.

Other shows for the end of the semester include:

"The Sky's the Limit - Out There: The Quest for Extrasolar Worlds" on Tuesday, November 28 and Thursday, November 30 from 4:00 p.m. - 5:00 p.m.

Come join our regular sky tour and then explore the possibilities of life outside of our solar system with "Out There: The Quest for Extrasolar Worlds." For thousands of years, we have thought that we are the only beings in the universe. But maybe...?? This show is a production of The Swiss Museum of Transport Planetarium in cooperation with NCCR PlanetS and the European Southern Observatory (ESO).



"Dark Side of the Moon" on Tuesday, November 28 and Thursday, November 30 from 7:00 p.m. - 8:00 p.m.



"Dark Side of the Moon" is the realized vision of the classic 1973 rock album produced by Michigan State University's Abrams Planetarium. This is not a laser show but rather a full-dome visualization of the entire 43 minutes of the Pink Floyd masterpiece. Sit back and enjoy our 5.1 Surround Sound system as it takes you on a journey that can only be described as "trippy!"

"Saturday kids show" on Saturday, December 2, from 10:30-11:30am

Especially for younger audiences, come with us on a tour of the sky, learn about the constellations that you can see at this time of the year, and hear some fascinating stories about some of the constellations. Fly through space to other worlds, and learn about our current space exploration as told by kids through NASA's "Our World" video shorts.

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