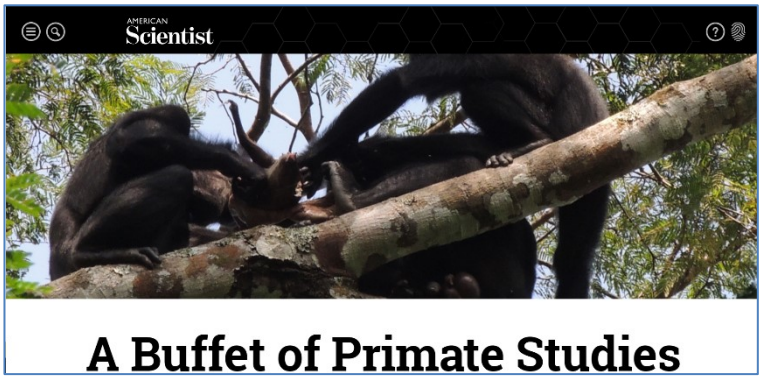
FROM THE DEAN'S DESK – August 31, 2018

THE RADFORD UNIVERSITY ARTIS COLLEGE OF SCIENCE AND TECHNOLOGY NEWSLETTER

Radford University at the Biennial Conference on Chemistry Education at the University of Notre Dame

RADFORD UNIVERSITY BIOLOGY STUDENT FEATURED IN AMERICAN SCIENTIST MAGAZINE

The work of Connor Philson, a senior majoring in Biology at Radford University, is featured in the magazine AMERICAN SCIENTIST focusing on primate research. In the article, the author notes that Solar-powered, automated feeding and recording stations developed at Radford University are helping scientists collect data on animal behavior in the wild.



Connor was one of the driving forces in developing these devices during the PASSER Project, Programmable Automated System for Songbird Ecological Research. He deployed the devices during his participation in the Radford Amazon Research Expedition (RARE) and the article notes that "Data collection was scant because nonhuman primates in the area kept a wary distance while the device was in place, but the two-week trial period demonstrated that the feeding station could withstand tropical weather and everyday wear and tear." To read more about this story, please visit https://www.americanscientist.org/article/a-buffet-of-primate-studies

Connor Philson in the Andes Mountains during his summer research visit to the Galapagos Islands. Photo by Christine Parent.

Conner also had an amazing experience this summer in the Galapagos Islands as a National Science Foundation, Research Experiences for Undergraduates Award Recipient (NSF REU) with Dr. Christine Parent from the University of Idaho studying adaptive radiation, and microhabitat variations of endemic land snails. "Having the opportunity to travel to mainland Ecuador and the Galapagos Islands as part of my National Science Foundation REU this summer was really special" recalled Conner.

"I was able to experience an entirely new type of research as we studied the adaptive radiation of land snails in the field for two months. This NSF REU experience was a great opportunity to build upon other research opportunities I've had here at Radford such as SURF and RARE."

Using a spectrometer on Pinta Island.

CHEMISTRY FACULTY PARTICIPATE IN UNIQUE RESEARCH AND ENRICHMENT EXPERIENCES

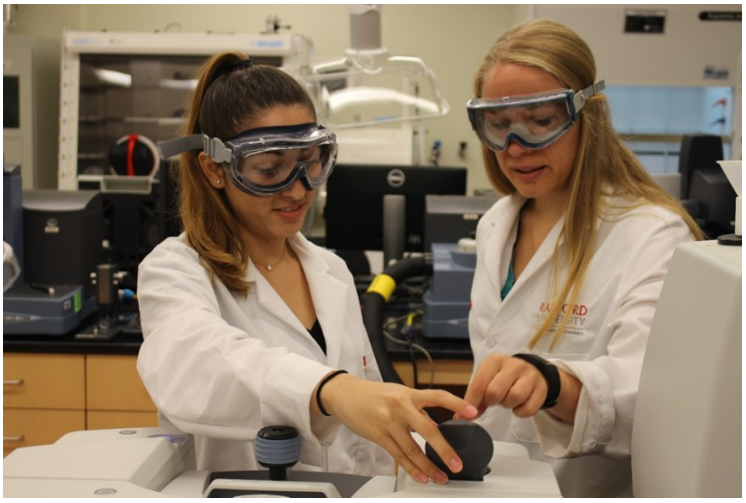
Radford University Department of Chemistry faculty members traveled the nation over the summer pursing opportunities for research and professional enrichment.

Most of the department traveled to Notre Dame in South Bend, Indiana for the Biennial Conference on Chemistry Education sponsored by the Division of Chemical Education of the American Chemical Society. The conference is designed for middle school science teachers, secondary school chemistry teachers, graduate students, and college chemistry faculty.

"The conference provides chemistry educators with opportunities for interacting with colleagues at all levels in formal and informal settings" states the event website. "Instructors who are new to chemistry education and those who have years of teaching experience will find this conference to be an excellent source of materials, techniques, and chemistry content."

This type of event allows for professional exploration with colleagues as well as new opportunities to network with professionals from around the nation. 2018 marks the 25th anniversary of this event.

Chemistry faculty at Notre Dame.



Dr. Kristina Roth-Stefaniak (right) working with a student in the Active Learning workshop at Indiana University Bloomington.

Dr. Kristina Roth-Stefaniak, assistant professor of chemistry, participated in the Active Learning in Analytical Chemistry Workshop at Indiana University Bloomington funded through the National Science Foundation's (NSF) Improving Undergraduate STEM Education program.

"At the workshop 20 analytical and instrumental chemistry instructors from across the country met to discuss and model active learning activities" stated Dr. Roth-Stefaniak. "It was a very productive workshop where current Radford teaching practices were shared and future ideas were conceived."

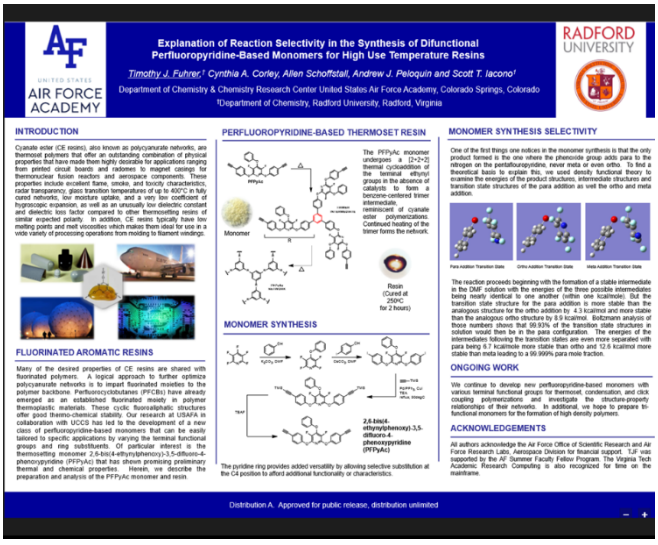
Radford University is seeing a direct benefit from her experience right away. **"**As a result of this workshop a Course-Based Undergraduate Research Experience was developed and has been added to the analytical chemistry curriculum this semester" said Dr. Roth-Stefaniak. "This project builds on the University's goal for an inclusive and experiential learning environment for the students."

The opportunity to work with Radford students utilizing some of the content of the workshop is intriguing for Dr. Roth-Stefaniak."I am very excited to begin and start working with my students on their projects" she said. "One part of this project I am looking forward to is a poster symposium that will be held at the end of the semester, where students from different Course-Based Undergraduate Research Experiences in the Department of Chemistry and Biology will gather to show their research results and discuss their experiences. My hope is to get freshman from both majors to attend and get a glimpse of experiences available in future courses." This experience speaks directly to the goals of the university's REALISE (REALising Inclusive Science Excellence in Biology, Chemistry and Physics) program.

Dr. Tim Fuhrer, associate professor of chemistry, spent his summer in Colorado as a participant in the U.S. Air Force Research Laboratory (AFRL) Summer Faculty Fellowship Program (SFFP). It is a program designed to bring professors from outside of the Air Force and Naval Academies on site to do research that complements work being done by the professors at the academies.

Dr. Fuhrer's research involves synthesizing fullerenes (pure carbon molecules) with fulvene. One of the primary uses of fullerenes is in solar cells, aligning Dr. Fuhrer's work with that of a professor at the Air Force Academy in renewable energy sources.

Dr. Tim Fuhrer, on the right, along with Jacob King, a 2017 Chemistry graduate who now goes to Pharmacy School in Denver on a fellowship provided by the US Navy.



Dr. Fuhrer's research poster.

"Not only did we make progress on the fullerene project that was the subject of my initial proposal, but I became involved with computational aspects of their fluoropolymer research and was able to give a poster presentation at the ACS Fluoropolymer Workshop in Denver this summer" stated Dr. Fuhrer. " The connections I made at the Air Force Academy significantly expanded my research interests."

In addition to his research activity, Dr. Fuhrer took advantage of the beauty of the Colorado Mountains for frequent hikes and outdoor adventures.

BIOLOGY STUDENTS EXCEL IN SUMMER INTERNSHIPS AND RESEARCH

Biology students had a productive summer, with many participating in internships or in research with faculty members. These hands-on learning experiences help cement students' interest in biology careers and open doors for future employment or research opportunities. A few of their stories are highlighted below, in their own words:

Taking tree core samples.

Bekah Shupe earned a coveted month-long internship with the Virginia Department of Forestry. She spent the month of June shadowing/working with VDOF employees and mentors.

"Ever since I was a kid I've loved learning about trees and plants" recalls Bekah. "During my internship I've had the chance to teach landowners about the composition of their forests through my knowledge of trees and plants. I've also been able to shadow other foresters and learn about forest management and the services VDOF has to offer landowners in Virginia. Participating in this internship has given me the experience I've been looking for as I continue onto graduate school."

Meghan Howard is spending the summer working at PrideRock Wildlife Refuge in Texas, getting a once-in-a-lifetime experience. She is working to care for rescued big cats - lions, tigers, cougars, and more.

"I am interning at PrideRock Wildlife Refuge where they focus on giving big cats a better life than they previously lead" said Meghan. "All the cats rescued and brought to PrideRock live out their lives here happily as they get to play, run, or sleep as much as their heart desires. Working here is an amazing opportunity, knowing that I'm making a difference in some extraordinary animals' lives."

Tigers at the PrideRock Wildlife Refuge.

A number of students worked on wildlife research projects with professor Karen Powers. They assisted with trapping and camera surveys for the rare Allegheny woodrat and acoustic surveys for the endangered gray bat.

Participating students were Karissa Aly, Jasemine Brown, Miranda Dimas, Neil McDonald, and Breann Mullen.

Breann (in lower right photo, with mouse) shared her thoughts about the experience.

"This summer has been nothing short of amazing" she recalled. "Working with Dr. Powers, my classmates, and cute critters has made for a summer full of new experiences and learning opportunities. My favorite part has been checking traps and handling the critters in them, but also checking trail cameras to see what animals were roaming the trapping sites."

Story by Karen Powers

DR. GRIGORY IOFFE PRESENTS AT TWO INTERNATIONAL FORUMS

Department of Geospatial Science Professor Grigory Ioffe traveled abroad this summer to present and gather more knowledge on a topic of his expertise – the Republic of Belarus.

From May 23-25 and June 4-6, he attended and presented at two international forums in Belarus and Russia. A longtime Radford University faculty member and Moscow native, Dr. Ioffe specializes in human geography and has been focusing on Belarus since 2002-03.

Professor Ioffe (second from left) presented at the International Geographic Union Thematic conference in Moscow.

The May forum, held in Belarus' capital of Minsk, was one of great significance, Dr. Ioffe explained.

Attendees included several high-level officials, including controversial Republic of Belarus President Alexander Lukashenko – the country's first and only leader since 1994 - and 350 national security experts from around the world.

A landlocked country in Eastern Europe, Belarus is often "blended with neighboring countries, especially with Russia," and has struggled to distinguish itself, Dr. Ioffe explained. Labeled by many as Europe's last dictatorship as a result of Lukashenko's authoritarian style of government, the country of about 9.5 million people has positioned itself as a neutral ground for negotiations. In 2015, the leaders of Russia, Germany, France and Ukraine gathered in Minsk to negotiate measures to alleviate an ongoing war in the Ukraine.

"Since then, Belarus has been working to strengthen its identity and open up to the western world," Dr. Ioffe said.

The May 24 Minsk Dialogue Forum, formally called "Eastern Europe: In search of security for all," was a culmination of these efforts.

"It was organized by a group of Belarusians who, on one hand, have contacts with the western world and, on the other, have good contacts with the country's political establishment," Dr. Ioffe said.

Presenters, including Lukashenko, discussed issues pertaining to national and global security, especially United States, Europe, Russia and Belarus relations.

In an article Dr. Ioffe authored for the Eurasian Daily Monitor, the flagship publication of the Washington-based Jamestown Foundation, he discussed "mutually confrontational" statements that led to some "heated" and "soothing" arguments at the Minsk Dialogue forum.

"Among other things, [President] Lukashenko talked about the danger of 'mutated challenges' to the system of international security in Europe and globally," Dr. Ioffe wrote in the Jamestown article, titled 'Successful International Security Gathering in Belarus Brings Together East and West.' "Those challenges imply cyber methods of information wars. At one point, he [Lukashenko] referred to Russia as Belarus's ally and mentioned the enlargement of the North Atlantic Treaty Organization (NATO) as a factor that led to the current tension in Europe. However, he also suggested that Belarus is 'neither with Russia against Europe, nor with Europe against Russia.'"

Dr. Ioffe called the forum "a political opening" and an "unprecedented event" for the Republic of Belarus.

In Moscow, Dr. Ioffe attended the International Geographic Union Thematic conference dedicated to the centennial of the Institute of Geography of Russian Academy of Sciences. Professor Ioffe worked at the Institute from 1980-89. There, he presented on Belarus, comparing the Republic to its neighboring country of Ukraine.

Dr. Ioffe has worked at Radford University for 28 years. His teaching and research specialty is broadly-defined human geography. Within this discipline, he has conducted research in the areas of population geography, geography of agriculture, geopolitics and national identity. His research has focused on East European settings and on processes with pronounced spatial dimension, typical for post-Communist countries.

Dr. Ioffe has authored and co-authored nine academic books, as well as dozens of peer-reviewed articles. Many of his essays about Belarus can be found on The Jamestown Foundation website.

Story by Mary Hardbarger

NEW FACULTY JOIN ARTIS COLLEGE – PART 1 OF 2

Fall semester 2018 has arrived and twelve new faculty members have joined the Artis College of Science and Technology. We wanted to learn a little more about each of them and help faculty, students, and staff get to know them just a bit better.

In the Biology Department:

Dr. Sarah Foltz, B.S. Biology, University of Washington,
Ph.D. Biology, Virginia Polytechnic Institute and State University, postdoc – VT

What is your specialty/focused field of study?

"I'm a behavioral ecologist, so I study how animals' respond behaviorally to their environment, how those responses impact their fitness, and how particular environments may elicit and shape behaviors" stated Dr. Foltz. "I'm particularly interested in how animals respond to urban environments and other anthropogenically disturbed areas."

Dr. Sarah Foltz

What drew you to that subject?

"I spend my childhood around animals and was always curious about what drove their behaviors and why they did what they did" recalls Dr. Foltz. "In undergrad, my first research experience was with a grad student who was studying urban populations of white-crowned sparrows in Seattle, and that work provided my introduction to the often-overlooked populations of animals that survive and thrive alongside humans."

What is something interesting in your life that you care to share?

"In my (mostly imaginary) spare time, I like to do crafty things – knit, sew, paper mache, etc."

Dr. Graham Glynn, B.Sc. Pharmacology and Biochemistry, University College, Dublin,
Ph.D. Neuroscience, Northeast Ohio Medical University of Kent State University

Dr. Glynn in blue cap and blue trimmed regalia at a meeting with university leadership in China.

What is your specialty/focused field of study?

"It was neuropharmacology because the brain is the essence of who we are" stated Dr. Glynn. "My current interest is in university leadership and building online learning communities."

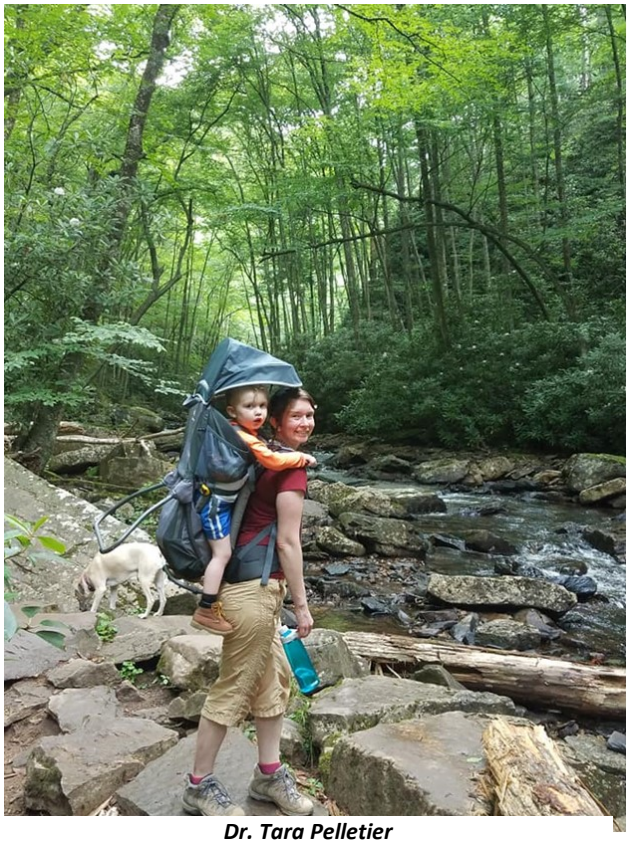
What is something interesting in your life that you care to share?

"I represented Ireland in the European Archery Championships."

Dr. Tara Pelletier, B.S. Biology, Salem State College,
M.S. Biology, Portland State University,
Ph.D. Biology, Ohio State University; postdoc – Ohio State

What is your specialty/focused field of study?

Phylogeography, population genetics, systematics, and computational biology. Her research uses genetic, geographic, environmental, and life history data to understand the eco-evolutionary processes shaping current biodiversity patterns, with an emphasis on conservation. As a postdoctoral researcher, Dr. Pelletier worked on a series of computational projects conducting global meta-analyses, as well as developed tools for other researchers to check how well their data fit models commonly used in population genetics. Her research program will combine fieldwork and genomics to understand how organisms are responding to climate change across geographic space. Locally, this project will focus on eastern salamanders.



Dr. Tara Pelletier

What drew you to that subject?

"I wanted to be outside as much as possible and that lead me to genetics and writing computer scripts. I am not sure how it happened, but I love it" recalled Dr. Pelletier.

What is something interesting in your life that you care to share?
"I ran a 50K trail race one time, and I kind of want to do it again."

Dr. Ariel Firebaugh – Postdoctoral Teaching Fellow, B.S. Biology, Roanoke College,
Ph.D. Environmental Sciences, University of Virginia

What is your specialty/focused field of study?

Insect ecology. Her doctoral research studied impacts of light pollution on firefly courtship and dispersal and on arthropod communities. She is active in STEM outreach as a citizen science project facilitator and the Firefly festival coordinator.

What drew you to that subject?

"I was mesmerized by the variety of insect forms I saw in an old field guide at the school library" Dr. Firebaugh recalled.

What is something interesting in your life that you care to share?

"Unbeknownst to me, one of my students once cold-emailed the famous ecologist E.O. Wilson for advice on a research project" she stated. "He sent back a thoughtful, personalized response."

Dr. Firebaugh in the field collecting fireflies for her research.

In the Chemistry Department:

Dr. Anna Curtis – Postdoctoral Teaching Fellow, B.S. Chemistry, UNC-CH,
Ph.D. Physical Chemistry, University of Colorado Boulder

What is your specialty/focused field of study?

Anna Curtis received her doctoral degree in chemistry from the University of Colorado Boulder where she studied the electronic properties of semiconductor quantum dots, which have applications in photodetector and solar cell technologies. Anna received the Chancellor's Award for Excellence in STEM Education to study the effect of course reform on students' critical thinking skills during a first semester general chemistry course at CU Boulder. The current focus of her research lies in chemical education, particularly in course assessment and reform.

Her interest in chemical education is driven by her belief that, with the right attitude and environment, all students are capable of learning chemistry. In her role as a postdoctoral fellow in the REALISE program, her contributions will include working with other members of the team to implement engaging and inclusive pedagogies and to assess and discover the impacts of these reforms. She will also teach general chemistry in the chemistry department at Radford

What is something interesting in your life that you care to share?

She worked with faculty members to redesign the General Chemistry for Chemistry and Biochemistry Majors' course from traditional lecture to a partially flipped classroom format in order to promote students' scientific thinking skills.

In the Department of Information Technology:

Mr. Freeman Lo, B.S. Information Systems, Virginia Commonwealth University,
M.S. Education concentration in Computer Science, Radford University,
M.S. Computer Science, Towson University

What is your specialty/focused field of study?

In the field of computing, I most enjoyed working on databases in querying systems in pulling out key essential information. This led me to the field of Data Science which involved some understanding on analyzing unorganized data in a database system. Also, by using one such programming language called python to dissect this type of non-relational database systems.

My current focus in Computer Science is with Data Mining and Data Analytics on medical data. Previous positions include System Analyst (Unix/Solaris/Linux/Mac Administrator) at the UNC-CH School of Medicine: System Administrator (Senior System Analyst) at the JHU-Sheridan Libraries: Application

Developer at JHU Medicine, and most recently : Linux Administrator at University of Maryland at Baltimore

What drew you to that subject?

"The love of finding out new things in the world of computing" stated Professor Lo.

What is something interesting in your life that you care to share?

"I enjoyed traveling to Europe to sightseeing as well as an avid opera goer."

We will feature additional new faculty in our next edition of *From the Dean's Desk.*

DR. KIM LANE FEATURED ON PUBLIC RADIO SHOW *WITH GOOD REASON*

Radford University Associate Professor of Chemistry Kim Lane recently appeared on the public radio program *With Good Reason.*

In a recorded interview, Dr. Lane spoke about how she and a team of student researchers at the university are exploring ways to ease the side effects of a potent chemotherapy drug used against colon cancer.

At Radford University, Dr. Lane's research delves into the "determination and analysis of protein structures, including prenyltransferase and bacterial b-glucuronidase, whose substrates and products have been implicated in the occurrence and/or treatment of human cancers."

The interview with Dr. Lane was broadcast August 18th through the 24th on more than 60 With Good Reason stations across the United States. The program is carried in the New River Valley each Tuesday afternoon at 6pm on Public Radio WVRU 89.9. Her archived interview is available as a podcast at withgoodreasonradio.org.

With Good Reason is produced by the Virginia Foundation for the Humanities for the Virginia Higher Education Broadcasting Consortium and is broadcast on public radio stations in Alaska, Colorado, Florida, Georgia, Hawaii, Indiana, Massachusetts, Michigan, New Mexico, New York, Ohio, Tennessee, Texas, Virginia and Washington, D.C.

With Good Reason has won five Gabriel Awards for Best Documentary or Public Affairs Programs, and is the recipient of top honors from the Public Radio News Directors, Radio and Television Digital News Association and the Virginia Association of Broadcasters.

Story by Chad Osborne

DR. CALEB ADAMS PARTICIPATES IN NSF WORKSHOP

Dr. Caleb Adams, Mathematics and Statistics, Radford University, (pictured at left on the front row) was one of 20 faculty selected from around the country to participate in this workshop held at Manhattan College, Riverdale NY, 22-28 July 2018.

SIMIODE is a National Science Foundation funded effort in support of a learning community at www.simiode.org with resources for teaching differential equations through modeling and real-world situations. SIMIODE advocates and supports an inductive approach to learning differential equations through context with the use of Modeling Scenarios.

Participants engaged in learning new activities for teaching using realistic situations through presentations and team teaching experiences in applying mathematics to such areas as biology, chemistry, economics, and engineering. Topics included using M&M candies to simulate death and immigration in populations, modeling chemical reactions, determining how animals detect predators and their reaction efforts, modeling shock absorbers, and studying epidemics.

MINDE -- Model INstructors in Differential Equations Workshop was a Practitioner Workshop for faculty to participate in a challenging and invigorating faculty development opportunity to enhance their teaching of undergraduate differential equations in a modeling-first approach. Those selected to participate actively engaged to enable them to incorporate curricular materials and pedagogies using modeling to motivate learning differential equations in context with their students after the workshop.

Participants return to their home institutions and incorporate applications to motivate student learning, share what they experienced with colleagues, speak at professional meetings about using real-world situations to motivate the study of mathematics, and publish articles about their classroom experience using a modeling approach.

Museum of the Earth Sciences

RADFORD UNIVERSITY
Department of Geology

RADFORD UNIVERSITY
Museum of Earth Sciences

RADFORD UNIVERSITY
Artis College of Science and Technology

MUSEUM OF EARTH SCIENCES LECTURE SERIES, 2018

Wednesday, September 5th, 7-8:30 pm
Hurlburt Auditorium, "The Bonnie"

Sustainability, awareness, and the changing global environment: The interdisciplinary natural laboratory of the Aysen region, northern Patagonia, Chile

Dr. Ryan Sincavage
Assistant Professor
Geology Department,
Radford University

As natural systems evolve, vulnerable populations respond and adapt to changing environmental conditions. The Aysen region of northern Patagonia in Chile is not only one of the most remote and beautiful landscapes on Earth, but also home to the seemingly competing interests of tourism, agriculture, natural resource extraction, and preservation. This talk will discuss the natural processes and hazards of this delicate region, how they have evolved through time, and strategies for increasing awareness of the changing natural environment to both residents and visitors. These interdisciplinary issues and more will be the focus of a study abroad course to the region over the 2018-19 winter break, as well as a National Science Foundation proposal currently in development by Radford University researchers with collaborators from across the U.S. and around the world.