

April 28, 2011



CSAT Bi-weekly Newsletter

From the Dean's Desk

Math Graduate Program Awarded \$200,000

Math faculty members Agida Manizade and Laura Jacobsen were recently awarded \$200,000 from Virginia's Department of Education for the "Southwest and Southside Virginia Secondary Mathematics Professional Development Center" grant. This is the second grant to fund a project to help high school teachers in Southside and Southwest Virginia.

Manizade and Jacobsen received an earlier \$200,000 grant from the Virginia Department of Education in 2010 to support the Southwest and Southside Virginia Secondary Mathematics Professional Development Center at Radford University. They currently have 24 partnering school divisions and intend to include new partners from the Richmond area.

This math and science partnership grant project is designed for high school teachers interested in improving mathematical content knowledge for teaching algebra, geometry, mathematical analysis and modeling.

The project intends to design and deliver an instructional program, free of charge to teachers, that ensures mathematics educators' awareness and fluency with the content defined by the mathematics college and career readiness expectations.

Teachers will also have an opportunity to participate in an action research project. Faculty members from RU intend to provide professional development to university instructors involved in teaching graduate mathematics

classes offered through the grant project.

Finally, a comprehensive program evaluation will be carried on to assess change in teachers' content knowledge, improvement in their high school students' mathematical knowledge, and progress towards identified local educational needs in mathematics.

This grant project also allows RU to establish a partnership with Virginia Commonwealth University in order to promote statewide collaboration and offer a Radford University mathematics education master's program in the Richmond area.

RU Wetlands Article Wins Publishing Award

A feature article about the innovative use of the RU Wetlands "University Facilities as Real-World Foci of Multidisciplinary Science Learning" published in the May/June 2010 issue of *The Journal of College Science Teaching* was awarded the bronze award in the feature article category in the annual EXCEL Awards Competition conducted by the Association of Media and Publishing. The same article was also selected as an "editor's choice" article in the education section of the *Plant Science Bulletin* 56(2) 2010.

The article was written by CSAT faculty members Jeremy Wojdak, Judy Guinan, Joseph Wirgau, Charles Kugler (retired), Georgia Hammond, Christine Small, Charles Manyara, Frederick Singer and Chester Watts. RU director of academic assessment Bethany Bodo and University of Maryland faculty member Andrew Baldwin also contributed to the article.



RU Wetlands

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Upcoming Events:

- May 1, 4—7 p.m., CSAT Spring Picnic, Bisset Park, shelter 1
- May 7, noon, CSAT Commencement Ceremony, Cupp Stadium

Mathematics Takes a Village

Many hands stir the pot of inquiry in students, or add ingredients to make sure young minds reach their full potential. This is the case with first-generation college student and Department of Mathematics Dean's Scholar Camron Withrow. Many people observed his potential and thirst for knowledge, then took an active role in giving him the opportunities to excel. Withrow is an inspiration to his RU professors and other mathematicians in the New River Valley.

But, Withrow wasn't always interested in school. "I thought it was boring and I wasn't a very good student up until my junior year at Auburn High School," he says. During his junior year, he took chemistry and physics. "In chemistry, we studied electron orbitals. We were taught that a partial differential equation is behind the numbering of the electron orbitals. However, my teacher didn't teach us the theory. But I just had to know why the orbitals were numbered the way that they were. I researched the equation on my own to understand the numbering system," adds Withrow. And that's when his teacher Charles Jervis took notice that Withrow was special.

Jervis saw that he had an insatiable mind and loved to learn. So, he invited Withrow to a special relativity class being taught at the YMCA in Blacksburg. "The teacher of the class was a retired meteorologist. I was by far the youngest person there," Withrow says. "It was a blast!"

While Withrow was taking Algebra II in high school, he was teaching himself Calculus at home. "During my junior year, I read the book *A Tour of Calculus* by David Berlinski. I just asked my parents for textbooks and they said 'okay, I'll try to find them,'" he says.

When it was time to apply to colleges he only applied to Virginia Tech and was accepted into the physics program. But because of financial reasons he couldn't enroll. He began taking classes at New River Community College and then transferred to RU as an applied mathematics major.

While in mathematics professor Jürgen Gerlach's Calculus III class, Withrow excelled. Gerlach asked Withrow if he'd like to study the Fourier Series with him, which is using trigonometry to break up complex sound into pure tone components. For example, cell phones, internet and radio all depend on the Fourier Series. Withrow studied with Gerlach and learned about his research interests in detecting discontinuities of functions in the theory.

In addition to being a successful student inside the classroom, Withrow has an innate need to always be learning and solving complex problems. During the last several years, in his free time, he has been learning

number theory with Virginia Tech Professor Emeritus of Mathematics Peter Fletcher, who he met through a mutual friend. Number theory is a branch of pure mathematics that studies the properties of integers. "A lot of my math I learned on my own because I was interested and wanted to learn, so my knowledge was patchy. He helped me fill it in," Withrow adds. After number theory, they graduated to topology, which is the study of spatial properties that are preserved under continuous deformations of objects; objects can be deformed through stretching but not tearing or gluing.

During his third semester at RU, Withrow took MATH 280 Problem Solving taught by John McGee. Gerlach told McGee to give Withrow harder problems because he likes to be challenged. McGee asked Withrow if he wanted to do an independent study in elliptic curves, which is a hybrid between applied and theoretical mathematics. Withrow presented his study during the CSAT Chalk Talks in the fall and will present at the undergraduate research forum.

"Camron is the strongest student I have seen in the department. The work he is doing is not undergraduate work, this is the deep waters of mathematics. This is done by third year students in a mathematics Ph.D. program," says McGee.

"It has been a singular privilege to work with Camron. It's like having a tiger by the tail. I've learned even more mathematics, just trying to keep up with him," he adds. "I've challenged him with the area and he's challenged me with the actual mathematics. We'd love to have more students of Camron's caliber," he says.

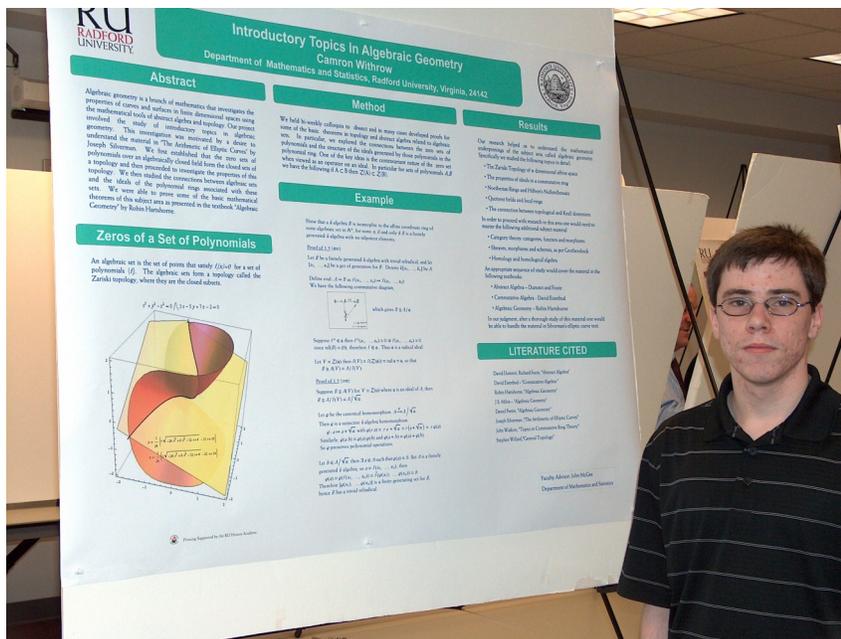
RU offers exemplary students an opportunity to have on- on-one time with faculty in their area of interest. "Here, you can lead your own education based on your interest and need for challenges," says Withrow.

"We have picked students out of the crowd before who we think are in need of extra challenges," adds McGee. He says the department's faculty members discuss their students and make sure these interested and gifted student mathematicians have the chance to grow at their own accelerated pace to reach their potential.

Withrow is accepted into Virginia Tech's master's program in mathematics. He thinks a Ph.D. program is also in his future, but not quite yet. He wants to stay close to home for two more years.

Withrow says he's looking forward to his graduate studies and using all the knowledge he has spent years acquiring. "It's fun to focus on what I'm interested in. It's nice to just study mathematics. It's great when all the background knowledge you've been studying settles and then you have this new understanding of what you were supposed to know before," he adds.

Camron Withrow



MCAT Scholarship Created for Pre-Health Program

Thanks to the generous financial support of former Radford University Vice President for Academic Affairs Ann Ferren, a qualified RU student will be awarded an Medical College Admissions Test (MCAT) preparation course scholarship. The competitive scholarship is intended to offset a portion of the cost associated with an MCAT preparatory course.

Admission to medical school is based on an applicants academic performance, patient care experience through shadowing, and community service. The students' academic performance is based on their overall grade point average, their grade point average in the sciences and math, and their MCAT score. The MCAT preparatory course can help student increase their scores on the admissions test, but the \$2,000 course cost may be prohibitive for some.

The purpose of the scholarship is to give RU students a level playing field in applying for admissions to medical school. Scholarship applicants will prepare a portfolio that will be evaluated by pre-med advisors of the CSAT

Pre-Health Advisory Committee. Award of the Dr. Ann S. Ferren MCAT Preparation Scholarship will be based on evidence for predicting success as a medical student.

"The cost of the preparation course is cost-prohibitive for our students, placing them at a disadvantage to wealthier students. This generous donation by Dr. Ferren to create this scholarship will give our students a level playing field to compete for placement in medical school. This scholarship will make a difference in the lives of promising students who want to become medical professionals and give back to their communities through their service in health care," says CSAT dean J. Orion Rogers.

The first scholarship will be awarded in the fall of 2011.

CSAT Dean's Scholars To Be Honored During Commencement

The College of Science and Technology will honor its 2011 Dean's Scholars during its Commencement Ceremony on Saturday, May 7 at noon in Cupp Stadium.

The 2011 Dean's Scholars are graduating seniors chosen by their academic program faculty to be the most accomplished in its graduating class.



Heather Bostic

Anthropological
Sciences



Justin Drake

Biology



Elizabeth Gichana

Physics



Bretny Khamphavong

Information Science
and Systems



Pierce Meikle

Computer Science and
Technology



Rachel Rigney

Chemistry



Camron Withrow

Mathematics



Jason Yonts

Geology

Geology Student Awarded \$1,000 Field Camp Scholarship



Sarah Gregory

Geology major Sarah Gregory received a prestigious ConocoPhillips field course scholarship for \$1,000 to attend a field camp in the Rocky Mountains this summer.

ConocoPhillips sponsors this scholarship to provide support for students to attend Indiana University's Neotectonic and Geophysical Field Geology course in the Rocky Mountains. The scholarship was awarded in recognition of the fundamental importance of experiential, field-based learning in the development of a professional geologist/geophysicist.

"I am very excited to receive this scholarship because it supports my goal to attend field camp this summer in South Dakota. I am especially excited to attend the geophysical option of the camp because I will be receiving hands on experience with new and upcoming technologies such as Terrestrial Laser Scanning and RTK GPS devices. The use of these technologies in the professional arena is increasing greatly, so to gain experience with them this summer will be extremely beneficial," says Gregory.

Biology Student and Alumni Achievements

Recent biology graduate **Craig Bland** was hired as an intern for the Georgia Department of Natural Resources -- one of only two interns hired by that department. Duties for this job will include netting for bats along coastal Georgia and surveys for rare small mammals around the state. Bland has worked for two years with biology faculty member Karen Francl on her bat surveys.

Biology junior **Erin Fowler** and biology sophomore **Jasmine Jackson** have just been notified that their research presentation "Expression of Arsenic Resistance Genes in Bacteria from an Arsenic Mine" has been accepted at the National Collegiate Honors Council Conference to be held October 19-23 in Phoenix, Arizona. Fowler and Jackson conducted their research under biology faculty member Georgia Hammond's direction.

Biology graduate **Lana Hall** was recently named April's *Student Standout* in Lynchburg College's Doctorate of Physical Therapy Program.

Hall says that her interest in physical therapy was sparked during her time at RU. "As a biology major at Radford University, my innate curiosity compelled me to study and learn. It was at this point that human anatomy caught my attention. From then on, I was determined to find a profession in which I could study the inner workings of the human body and satisfy my desire to care for those in need," says Hall.

To view Hall's *Student Standout* profile, visit www.lynchburg.edu/x28069.xml.



Lana Hall
Photo courtesy of
Lynchburg College

Geography Alumnus and Successful Businessman Offers Advice

Geography graduate Brian Connelly works today in financial management and visited campus to give soon-to-be graduating seniors advice on how best to manage their financial future. He discussed the importance of saving, budgeting and debt reduction. Connelly is a principal partner in Stuller, Connelly & Fingfeld, LLC, an independently owned financial firm that specializes in Retirement Planning, Wealth Management, and Estate Protection located in Midlothian, Va.



Right: Brian Connelly discusses financial management with students

Left: Students listen to advice about saving and retirement



CSAT Offers Summer Science Program for Female High School Students

The College of Science and Technology is inviting rising sophomore, junior and senior high school females interested in mathematics, information technology and science to participate in the university's Summer Bridge Program 2011.

Summer Bridge is a week-long academic residential program operating from Sunday, July 10 – Friday, July 15.

The goal of the Summer Bridge program is to introduce female high school students to future educational and professional opportunities available to them in the mathematics, science and information technology fields.

Camp participants will work with Radford University professors Donna and Cliff Boyd, Prem Uppuluri, John McGee, Brenda Hastings, George Stephenson and Elizabeth McClellan throughout the week to explore space, environmental science and forensic science.

During the program's formal Summer Bridge 2011 Banquet, students will meet and learn from keynote speaker, Summer Bridge sponsor and Radford University alumna Dale Lee, vice president and corporate secretary for RGC Resources, Inc., which is the holding company for Roanoke Gas Company and Diversified Energy Company.

Full scholarships are available for Summer Bridge 2011 thanks to program sponsors Dominion Resources, Alpha Natural Resources, Project Discovery, Novozymes Biologicals, ATK Energetic Systems, Verizon, Areva and Dale Lee. Scholarships are awarded competitively.

For more information visit www.radford.edu/bridge.

CSAT Hosts Camp Invention for Elementary School Students

For the third year, the College of Science and Technology will be hosting and directing Camp Invention, a fun-filled week of investigations, experiments, and engineering challenges that will blow your child's mind! This high-energy day-camp from Monday, June 20 – Friday, June 24, 2011 is for rising first through rising sixth graders and sponsored by the National Inventors Hall of Fame.

The summer 2011 program features the SPARK curriculum which includes...

The Curious Cypher Club™

Mysterious coded messages have been found at the Curious Cypher Club (CCC) headquarters, and children are enlisted as new members – spending the week deciphering strange messages, sending coded messages, and constructing their own clubhouse.

Bounce! An Atomic Journey™

Children investigate the science of bouncy balls! Through the dynamic use of chemistry, experiments and investigations, children bounce their way through atoms, molecules, mixtures and compounds to figure out how cool matter, like a bouncy ball, is created.

Wild: Wondrous Innovations and Living Designs™

Employed by many scientists and engineers, nature has often served as inspiration to mankind throughout the history of time. During this module, children embark on a wild animal adventure to investigate some of the most spectacular and innovative animals on the planet. Children are introduced to the concept of biomimicry and explore how nature can be used to inspire new innovations.

Game On: Power Play™

The Game On: Power Play module scores a home run by combining physical activity and creativity. Children practice teamwork, cooperation, coordination and creative problem solving processes during fun, energetic games.

I Can Invent: Edison's Workshop™

Children walk in the steps of Thomas Edison as they create multi-step inventions that they name and prepare to market. Children use science, creative problem solving processes and hands-on applications to further their inventiveness and critical-thinking skills. Working in teams, younger children focus on building ball machines that send a ball into one of two ending points, while older children create multi-step, Rube Goldberg-type machines that raise a flag proclaiming their success.

Currently, there are 40 students registered for the program. Registration is open until the first day of camp. All immediate children of Radford University faculty and staff receive a \$30 registration discount. For more information, contact Ann Brown at abrown238@radford.edu.





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Innovation Inspired

www.radford.edu/csat

CSAT STEM Club News

Our last meeting of the semester was held on Tuesday, April 26, 2011. The following people will be the new officers for next year:

Erin Fowler-President
Jonathan Pingilley-Vice President
Jared Johnson-Webmaster
Stephanie Shaver- Treasurer
Jasmine Jackson- Secretary

The CSAT STEM Club will be having its spring picnic on Sunday, May 1 from 4-7p.m. at Bissett Park. Please attend if you are available. We will be having food and drinks, and we would like for everyone in the STEM majors to come out before exam week.

We also would like for anyone who would be available to volunteer on Saturday May 7 for commencement to contact Erin Fowler. We need volunteers from 11-12:3pm down near the Dedmon Center. For more information, please contact Erin Fowler.

Jasmine Jackson
Secretary of CSAT STEM Club

Geospatial Science Program Launches Research Balloon

Geospatial science faculty Andrew Foy and Rick Roth and School of Environmental and Physical Science Interim Director Bernd Kuennecke launched a balloon-based remote sensing platform for the first time at RU's Earth Day Festival on Wednesday, April 20. The balloon and sensors, which include a high resolution full frame camera and thermal infrared camera, will be used for local scale phenology studies, forensic sciences research, emergency response and to photograph campus events. The project was funded through a multi-disciplinary grant and the College of Science and Technology to encourage collaboration and student and faculty collaborative research.

