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Published October, 2014

# FUNDING

## Adult Education

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### Degree Completion for Adults

Mason 4-VA provides funds to support the start-up of the Bachelor of Applied Science (BAS) degree completion program. This unique program allows adult students (age 25 and older) who have received an Associates in Applied Science (AAS) degree, to pursue a Bachelor's Degree at Mason. The program was designed to provide the adult learner with the skills and credentials necessary to compete in a rapidly changing workplace, enhance their earning power as well as their professional potential. It will also honor and build on the learning, education and work experience that has taken place previously in the student's life.

The program's online access is a good fit for the working adult, the stay-at-home parent, someone who is looking to change careers, or military veterans who want to continue their education the Post-911/GI Bill. Two online concentrations, Technology and Innovation, and Health, Wellness and Social Services address 4-VA goals of accessibility and affordability to students throughout the commonwealth and both offer good employment opportunities for graduates.

New online concentrations in Cybersecurity and Organizational Leadership are slated for development during FY15. More information can be found at [bas.gmu.edu](http://bas.gmu.edu).



### OASIS: A Special Place for Adult Learners

The OASIS website serves as a one-stop shop for information relevant to adult learners at Mason, and a place where potential adult students can have their credits from other institutions evaluated through the Transfer Credit Search Engine (TCSE).

With additional funding from Mason 4-VA, the transfer credit search engine is becoming a robust tool to determine transferable credits, time to graduation and total costs involved.

For more information see [OASIS.gmu.edu](http://OASIS.gmu.edu).

### Mason 4-VA Funds Support BAS Program Efforts:

1. Production of two online BAS courses.
2. Marketing and promotional materials distributed to six targeted community college systems.
3. Development of pre-admission counseling and advising infrastructure.
4. Increased support for the OASIS project (Online Adult Student Information System) and specifically the Transfer Credit Search Engine (TCSE).

# SHARED COURSES

# ADMINISTRATION



## Ornithology Shared Course Draws Birders From Mason and Madison

A course shared between Mason and James Madison in Spring 2014 was Ornithology, taught by Mason Assistant Professor of Biology Dr. David Luther. Dr. Luther grew up in a bird watching family. Both of his parents were avid birders, yet he did not consider studying ornithology until he was in college. He realized that birds are easily accessible to anyone with an interest. They are all around us. Dr. Luther's dissertation for his PhD at UNC Chapel Hill focused on animal communication and community ecology in the Brazilian Amazon.

Dr. Luther's current research interests continue to focus on animal communication and the vulnerability of bird species impacted by habitat loss. In a collaborative grant awarded by Mason 4-VA, Dr. Luther and Dr. Jeff Walters from Virginia Tech are developing a database of Endangered Species Act (ESA) identified bird species with specific conservation action plans.

The Ornithology shared class covers a broad range of topics including bird vocalizations and conservation efforts. Birds sing in dialect and that dialect is impacted by location and changing conditions such as city noise. Dr. Luther hypothesized that increases in noise pollution cause birds to sing in a higher range, in order to be heard. Lower range birdsong dialects die out as a result. Dr. Luther also studies the loss of mangrove habitat. As a result of coastal development, pollution, and changes in sea level and salinity, mangroves could be extinct in 100 years. Thirteen of the 27 studied vertebrates dependent on mangroves are classified as threatened by the International Union for the Conservation of Nature.

Dr. Luther offers the course in a hybrid undergraduate/graduate format, so there are Mason and Madison undergraduate and graduate master's level candidates learning together. Emma Boyer, a Mason master's level Environmental Science Policy major, is writing her thesis on behavioral ecology and climate change. "The course is providing a great opportunity to experience ornithology in a more general sense and to learn about a wide range of topics that I would never be able to cover otherwise," Boyer said. This is Boyer's second Telepresence shared course. "I think a lot of professional interaction in the future will happen this way." She said that students are initially surprised by the "Star Trek like vibe" of the Telepresence classroom.

Dakota Kobler, a Madison junior biology major, was pleased to register for the Ornithology class because the traditional course at Madison was full. "Having a Telepresence course adds a lot of technical difficulties, but it is also a way to take courses otherwise unavailable. Not being able to personally meet with the professor is a downside, as I enjoy taking advantage of office hours. The professor did an excellent job at working through the technical difficulties and made himself available through phone or Skype, and always responded to emails promptly."

Rebecca Dickey, also a Madison junior biology major, mentioned the level of discourse in the classroom. She related, "It was an opportunity to associate with professors and professionals outside of my own university and within the wider scientific community. I believe that these kinds of associations are important to make early on in your academic career, especially if you intend to pursue further education. We've had several distinguished guest speakers this year, and being able to observe the way they share their information with a small group is a very valuable experience for undergraduates to have."



*Written by Linda Lane Sheridan*

# ADMINISTRATION

## 4-VA Virginia Management Board

4-VA's direction is set by the management board, which consists of the four university presidents, Virginia's Secretary of Education, the Executive Director of the State Council of Higher Education for Virginia (SCHEV), and Cisco's Senior Vice President.

In 2013-2014, Sharon Pitt served as the Executive Director and Amy Brenner was her Deputy Director. Kim Raley served in a supporting role for the state office. All three staff members are located at George Mason University.

## Staff

**Janette Kenner Muir**, Campus Coordinator

**Linda Lane Sheridan**, Deputy Coordinator for Mason 4-VA and Shared Course Coordinator for the Collaborative

**Hazel Moon**, Staff Writer

**Ben Allen**, IT Coordinator

## Mason 2013-2014 Advisory Board

Direction for Mason 4-VA research activities is supported by an advisory board composed of the following people:

**Julie Christensen**,  
Chair/Associate Professor, Russian, Modern  
and Classical Languages

**Kenneth A. De Jong**,  
Director, Research Computing/Professor of  
Computer Science and Associate Director,  
Krasnow Institute for Advanced Study

**Kimberly Eby**,  
Associate Provost for Faculty Development  
and Director, Center for Teaching and  
Faculty Excellence

**J. Goodlett McDaniel**,  
Associate Provost, Distance Education,  
Office of the Provost

**Laura Phelps**,  
Communication and Planning Division of  
Instructional Technology

## Mason 4-VA

Since its inception in 2010, the 4-VA Collaborative has created new pathways for collaboration, creativity, innovation and efficiency through a consortium of four universities — George Mason, James Madison, University of Virginia and Virginia Tech. The collaborative has shared a total of 33 courses with 547 students enrolled in STEM, social science and critical foreign language areas. Member institutions have collaborated on research initiatives, course redesign and faculty workshops. New concentrations in degree completion programs are providing Virginia adult learners with greater opportunities to complete their education through online and hybrid programs.

Mason 4-VA began the 2013-14 academic year with a new campus coordinator, Associate Provost for Undergraduate Education Janette Kenner Muir. Under her leadership, Mason 4-VA has renewed its focus on innovative collaborative research grants with a significant increase in grants and accompanying undergraduate research opportunities. Course redesign efforts in STEM areas produced significant student success rates. Mason 4-VA continues to thrive through ongoing partnerships with the Office of the Provost, the Instructional Technology Unit, and the Office for Student Creative Activity and Research.

## 4-VA Commonwealth Collaborative Goals

### GOALS:

- 1** Decrease the cost of delivering instruction.
- 2** Expand access to programs preparing all Virginians for rewarding careers.
- 3** Increase research competitiveness.
- 4** Enhance the success rates of students in STEM courses and programs.

One of the major goals of the project is to build a series of models that serve as a shareable educational library. “If you are interested in building a suspension bridge, you can go to our research website and download the models, print them yourself and use them in the classroom.” Given the relatively low cost of 3-D printing, the computer models are more difficult to disseminate and implement in the classroom.

“Any university or school, whether it is the 4-VA consortium, nationwide or international can use the tools that we develop to help their civil engineering programs, regardless of the facilities that they have on-site.”

In the future, Lattanzi is interested in developing ways to use 3-D printing technology as part of distance education programs. “If you have someone working at McMurdo Station in Antarctica who wants to finish their degree, we can develop a series of laboratory activities so that if they have a printer, they can print their own components, design and run their own tests and get experience in the process of engineering. I think that would be very cool.”

*Written by Hazel Moon*

### Other Redesigned Courses:

ASTR 111/112; Introduction to Astronomy: The Solar System and Lab

ASTR 113/114: Introductory Astronomy: Stars, Galaxies and the Universe and Lab

ASTR 115: Finding New Worlds

PHYS 260/261: University Physics II and Lab

BIOL 692/EVPP692 & 991: Community Ecology

EVPP 437/537: Ornithology



“

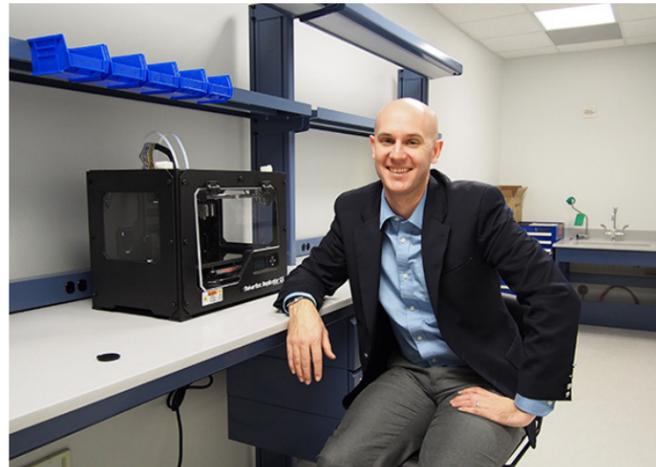
ANY UNIVERSITY OR SCHOOL, WHETHER IT IS THE 4-VA CONSORTIUM, NATIONWIDE OR INTERNATIONAL CAN USE THE TOOLS THAT WE DEVELOP TO HELP THEIR CIVIL ENGINEERING PROGRAMS, REGARDLESS OF THE FACILITIES THAT THEY HAVE ON-SITE.

”

## Building Bridges

Growing up in Pittsburgh, Dr. David Lattanzi (*pictured below*) Assistant Professor, Civil, Environmental & Infrastructure Engineering, was inspired and fascinated with the bridges that dot the city. Out of this fascination grew a desire to build and create structures that could significantly impact the cities and towns where people live. Dr. Lattanzi turned this inspiration into a PhD in civil and mechanical engineering and has now completed his first year of teaching at Mason.

One of Dr. Lattanzi's first achievements at Mason was the 4-VA Innovation Grant that he and Dr. Laura Kosoglu, Assistant Professor, Civil, Environmental & Infrastructure Engineering, were awarded to develop new methods of engineering education through the use of 3-D printers. "For civil engineers, one of the biggest challenges we have is that the things we make are very big," says Lattanzi. "It is very difficult to show students how to visualize their designs because we don't have millions of dollars (to build large-scale models)... The idea is to use 3-D printers to allow students to not only design their own civil infrastructure systems, but to build them to use as educational tools."

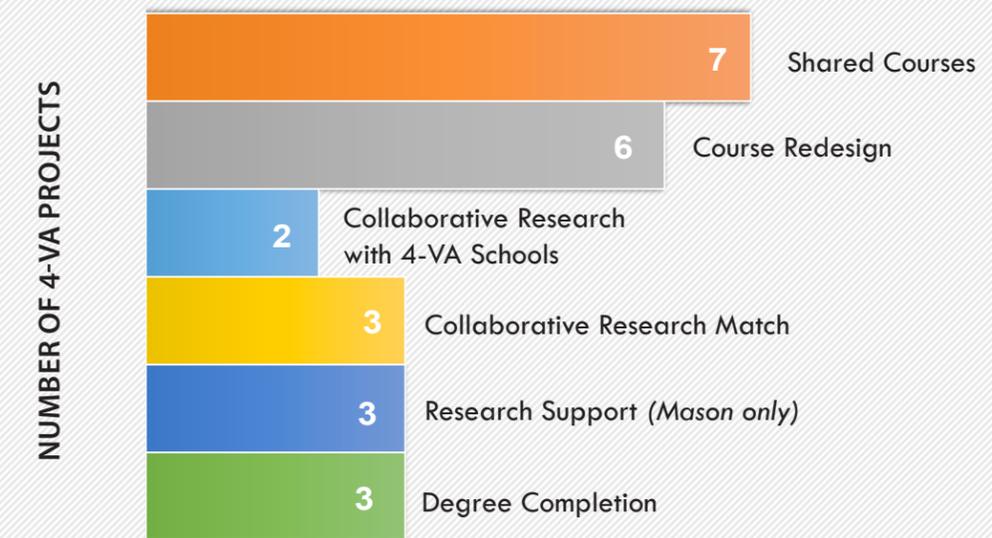
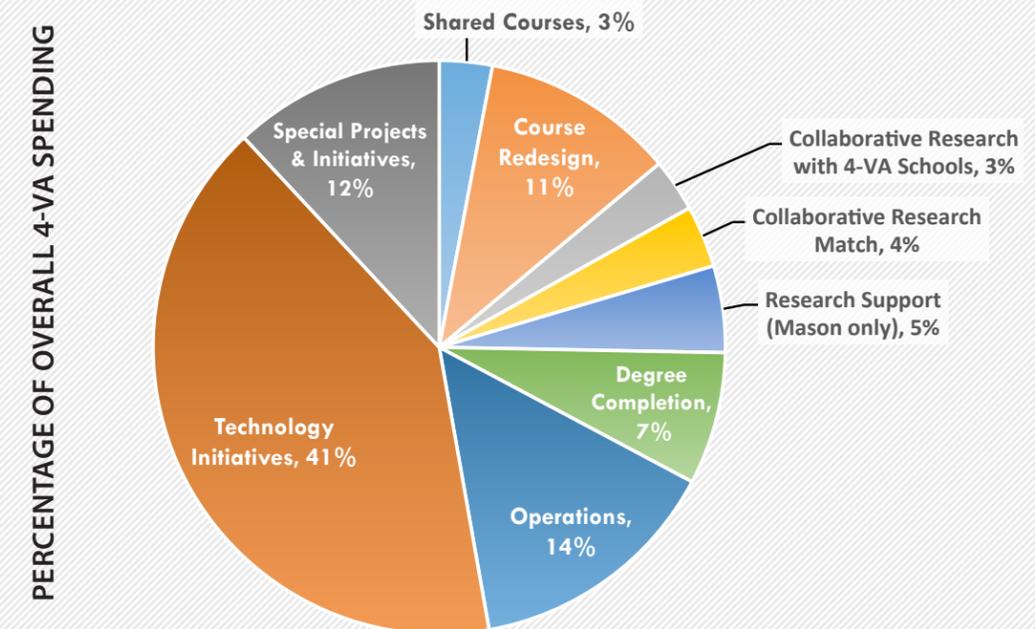


Prior to the development of 3-D printers, civil and mechanical engineering instructors were challenged by the limitations of computer graphics, drawings, and videos. "Right now, it's very rare to use hands-on models, and it's almost unheard of for students to be able to design and build their own models to use as teaching tools. 3-D computer simulations are just not the same thing." Mason is at the forefront of 3-D printing technology being used in such a fashion. "We don't have enormous airport hangar lab facilities that some other universities have access to. The use of 3-D printers allows us to replicate what they are doing on a small scale."

Lattanzi and Kosoglu plan to implement 3-D printing throughout the engineering curriculum. Starting at the 200-level, students will be able to use computer-aided drafting software to design models. Subsequent classes will build on these skills so that as juniors and seniors, students will be able to build and test their own models. The project will impact hundreds of students during any academic year.

Lattanzi credits his exposure to 3-D printing as a PhD student in motivating his interest in the use of the technology as an educational tool. Beyond Mason, there is the possibility of using 3-D printing technology in K-12 education. "3-D printing is a 2-stage process. The first thing you have to build is a 3-D computer model of whatever it is that you want to make and then use the printer to replicate that model into plastic or other material. The challenge for a lot of K-12 is actually not the printer, it's learning how to use the computer graphics programs because they are very advanced."

## Mason 4-VA: Breakdown of Expenditures & Projects



Total Expenditures: \$824,354

# BY THE NUMBERS



**Number of Grants/Projects  
Awarded (FY 2013-14):** 15

**Total Amount Funded:**  
\$341,717

## Collaborations:

Within the 4-VA collaborative and with partners including Fairfax Park Authority, Occoquan Regional Park, Smithsonian Institution, Virginia Early Childhood Foundation and Virginia Governor's School programs across the state.

## Resources:

Mason 4-VA collaborates with the following Mason units:

- Aspiring Scientists Summer Internship Program (ASSIP)
- Information Technology Unit
- College of Humanities and Social Sciences
- College of Science
- Office of Student Scholarship, Creative Activities, & Research (OSCAR)
- Smithsonian-Mason School of Conservation (SMSC)
- Governor's School at Innovation Park
- Volgenau School of Engineering

## Events Sponsored or Cosponsored by Mason 4-VA:

- Innovations in Teaching and Learning Conference, September 2013
- George Mason Water Forum – Water Awareness Month, March 2014
- STEM Boot Camp, August 2013
- Governor's School Teacher Professional Development Workshop, June 2014

**\$341,717** total amount funded

## Mason Water Forum Forges New Connections

*Principal Investigator – Paul Houser, PhD*

At the age of 13, Dr. Paul Houser, Associate Professor of Geography and Information Sciences (*pictured second from the left*), already knew that he wanted to be a hydrologist. He honed his skills building mud cities with storm drains, rivers and bridges in his backyard outside of rainy Portland, Oregon. Environmental Science and Policy Doctoral candidate Lisa LaCivita, worked as a fishing and river guide on West Virginia's New River. Bernadette LeMasters (*pictured far right*), also a PhD candidate in Environmental Science and Policy, spent time at the US Geological Survey's National Biologic Information Infrastructure. Intern and Environmental Science major Kathleen Copeland-Fish (*pictured far left*) grew up by the Chesapeake Bay. She wants to return after graduation and work at a nonprofit focused on wetlands and intercostal waterways. Intern Fernanda Craig (*pictured middle*) is also an Environmental Science major. Together, they comprise the Mason Water Forum.



The Mason Water Forum is a grant project funded by Mason 4-VA, created to encourage collaboration and communication on the topics of water science, policy and education between the Mason community, 4-VA members, K-12, other institutions and the public. Dr. Houser noted that before the Water Forum, research centers, departments and colleges on campus were siloed, and focused on their own departmental concerns. He believes this is counterproductive. "We are one Mason. Since the first Forum meeting, I've been able to strike up new collaborations. There's a professor that teaches water law in the School of Law. I know another professor at the Arlington campus that teaches courses dealing with water conflicts between countries. There are a number of professors that I used to work with in the climate sciences that do large scale water prediction and modeling." Bernadette LeMasters noted, "Even at USGS, disciplines needed to work together. The agency was contracting out for machinery that they didn't know they already had! They created a website as a clearinghouse. It's amazing how big these institutions get. They get locked into their own centers, their own funding needs."

The Water Forum sponsors a speaker series on campus and streaming through Google+ and uploaded to the YouTube channel MasonWater [www.youtube.com/watch?v=ZkkUZnnrXhA](http://www.youtube.com/watch?v=ZkkUZnnrXhA). There are designs for a campus website, but currently the Forum's activities can be found on their Facebook page, [www.facebook.com/masonwaterforum](http://www.facebook.com/masonwaterforum); as well as on Twitter at [#MasonWaterForum](https://twitter.com/MasonWaterForum).

This past March the Forum celebrated Water Awareness Month and sponsored numerous activities including speakers, two film screenings and a Water Awareness Challenge. Mason Forum members also manned kiosks at the Johnson Center to promote Water Awareness Month. This will be an annual event.

The Mason Water Forum serves not only as a clearinghouse but promotes further research collaboration. Dr. Houser noted that the Forum "reaches multiple goals within the academic community – engaging students and research. In doing big projects, it is often difficult for a single professor to solve all the problems of say a landfill. But if you have a group of professors, an ecologist, ground water hydrologist, an archaeologist, and unite these different people, there is a lot that you can do together than you can do separately."

*Written by Linda Lane Sheridan*



## Bed Bug Collaborative Research May Yield Alternatives to Antibiotics

Principal Investigator – Monique van Hoek, PhD

The common bed bug, *Cimex lectularius*, has become a problem where ever people live in close proximity to one another. Housing, healthcare facilities, hotels, and even libraries are frequent bed bug habitats. While bed bugs are not known to transmit diseases, they can be a particular nuisance in terms of biting people and causing skin problems. Even more frustrating is that bed bugs are extremely hard to get rid of. We would all be better off without them. Or would we?

Dr. Monique van Hoek (pictured at left) of Mason's School of Systems Biology sees bed bugs in a much more positive light. We all live with two different

kinds of bacteria: gram-positive and gram-negative. Some of these bacteria are helpful to us and some are harmful. Bed bugs, on the other hand, have only gram-positive bacteria. Considering that bed bugs live by feasting on humans, the fact that they don't have gram-negative bacteria is a mystery. Dr. van Hoek's hypothesis is that bed bugs have some sort of anti-microbial peptides or small proteins that are killing the gram-negative bacteria. These peptides could potentially save human lives in the future.

In collaboration with Dr. Ronald Raab (James Madison University), Dr. Rajeev Vaidyanathan (Clarke), and Dr. Barney Bishop of Mason's Department of Chemistry, Dr. van Hoek was recently awarded a grant from the 4-VA Program for their research into the molecular composition of bed bugs. The hope is to discover the specific peptides that are responsible for killing gram-negative bacteria and applying these discoveries to new forms of antibiotics. This research is critical due to increasing strains of antibiotic resistant bacteria. The collaboration came about due to an awareness of each other's research areas and discussions about how bed bugs are different from other organisms of terms of their bacteria killing properties. 4-VA collaborative research grants link expertise and funds across the consortium, thereby benefiting researchers and students alike. Students have the opportunity to work on collaborative research and to receive "real-world" lab experience that will benefit their future careers and studies.



Dr. van Hoek has always been interested in helping people. While completing a Bachelor's Degree in Biochemistry, followed by a PhD in Microbiology, she knew that she didn't want to be a doctor. However, she always wanted to take what she was good at doing and apply it in some way that would help others. "I have always been fascinated by how these micro-events translate into molecular events and I want to know what those are.

The bigger picture of this work is to find new kinds of molecules and in this case – peptides, that could be a new type of platform with which to develop a new class of antibiotics. Lots of people are working to find new alternatives to traditional antibiotics and I thought bed bugs would be a pretty unique place to start." The next time you are up all night thinking about the creepy-crawlies that are potentially lurking in the in the dark, you can sleep better knowing that they might one day save your life.

Written by Hazel Moon

## WHAT'S BEING TAUGHT

### Enrollment:

247 students in 11 different courses taught from Spring 2012-Spring 2014

### Subjects:

2 STEM courses, and 13 foreign language offerings in critical need areas such as Mandarin Chinese, Korean, and Turkish...

- |  |                          |
|--|--------------------------|
| • CHIN 300 Reading Skills Development        | Spring 2012, Fall 2013   |
| • CHIN 305 Chinese for the Business World    | Spring 2012, Spring 2013 |
| • CHIN 365 Reading Chinese Fiction After Mao | Spring 2012              |
| • TURK 110 Elementary Turkish                | Fall 2012                |
| • BIOL 692/EVPP 692 & 991 Population Ecology | Spring 2013              |
| • TURK 210 Intermediate Turkish              | Spring 2013              |
| • CHIN 318 Introduction to Classical Chinese | Fall 2013                |
| • KORE 110A Elementary Korean                | Fall 2013                |
| • KORE 210 Intermediate Korean               | Fall 2013, Spring 2014   |
| • CHIN 301 Advanced Grammar and Syntax S14   | Spring 2014              |
| • EVPP 437/537 Ornithology                   | Spring 2014              |

## GOALS MET:

- COLLABORATION
- INCREASED EFFICIENCY OF INSTRUCTION
- FULFILLS CRITICAL NEED FOR LANGUAGES NOT AVAILABLE AT OTHER INSTITUTIONS IN THE CONSORTIUM



Students learn Chinese in one of Mason's telepresence rooms.

# FOSTERING Innovation

## RESEARCH ACTIVITIES:

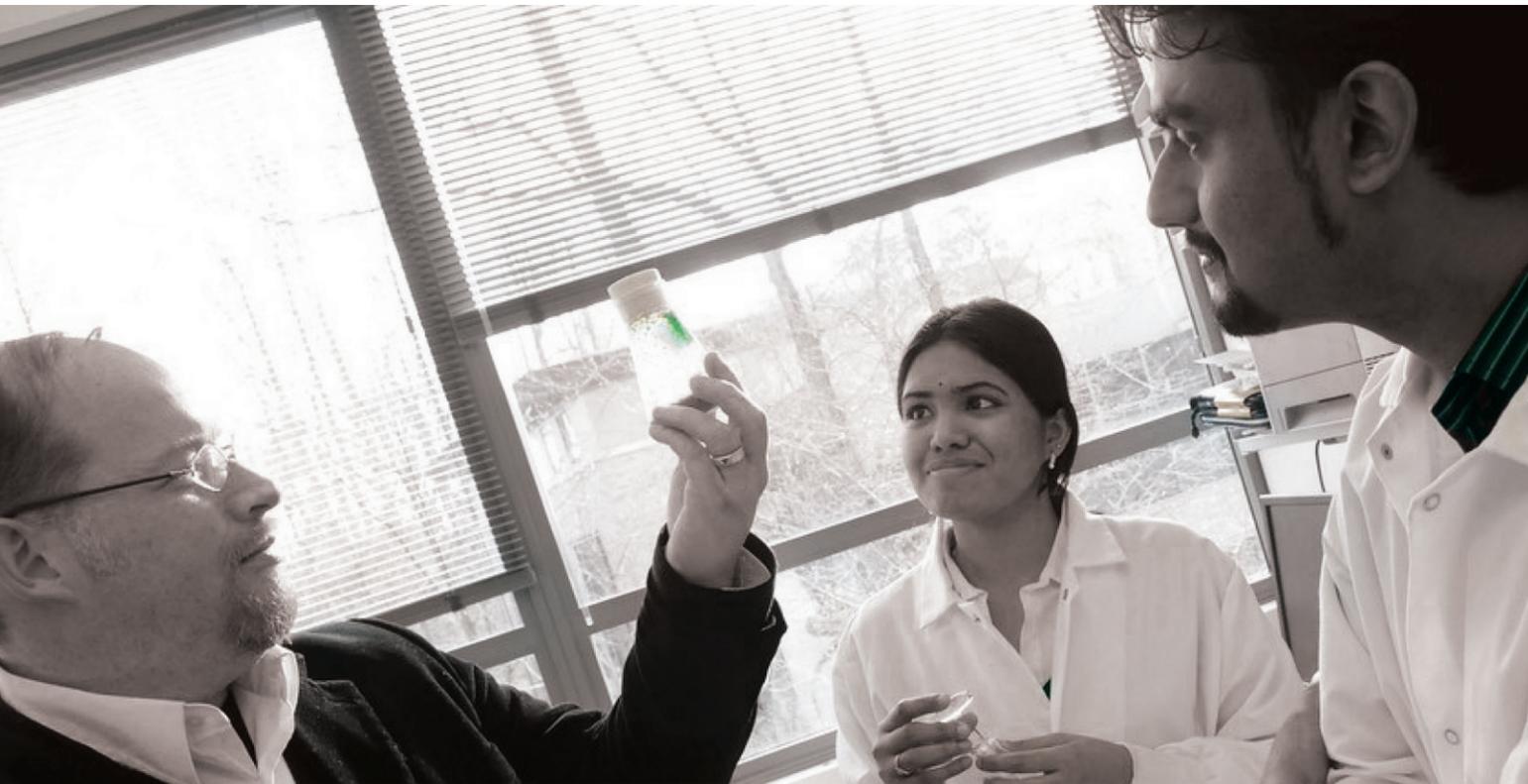
In FY 2014, Mason 4-VA awarded the first of a series of Innovation Grants to faculty, enlarging both the number and the scope of grants disseminated to Mason faculty researchers. Ten grants were competitively awarded this past year for a total of \$176,189. Many of the grants are collaborative efforts that include faculty from 4-VA partner institutions. Grants include a STEM boot camp, 3-D printing in a redesigned calculus course, and research on bedbugs, endangered species and water resources. The Innovation Grants join existing grant projects in course redesign and research in STEM areas.

## COLLABORATIONS:

Mason Researchers collaborated with other 4-VA institutions to research and support:

1. Conservation Actions and Endangered Species impacts
2. Antimicrobial Activity in the Bedbug
3. Molecular Dissection of Noxious Cold Nociception
4. The Water Forum Project
5. Aspiring Scientists Summer Research Program

10  
faculty  
members engaged  
in collaborative  
research with the  
help of 4-VA funds  
in FY 2014.



**\$176,189** FY14 total grants awarded

## Ten Innovation Grants Awarded FY14

<b>1. Project Title:</b>	"PATTERNS OF HYDROLOGY, PLANT COMMUNITY, AND SOIL BIOGEOCHEMISTRY TO RESTORE ECOSYSTEM SERVICES AT A WETLAND UNDERGOING THE LARGEST RESTORATION IN NATION'S CAPITAL"
<b>Lead Proposer:</b>	Changwoo Ahn, PhD, Associate Professor, Environmental Science & Policy
<b>2. Project Title:</b>	"ENHANCING STEM RETENTION WITH INTERACTIVE, ENQUIRY-GUIDED MODULAR COURSES"
<b>Lead Proposer:</b>	Virginia Espina, PhD, Research Assistant Professor, Applied Proteomics & Molecular Medicine
<b>3. Project Title:</b>	"GMU WATER FORUM"
<b>Lead Proposer:</b>	Paul Houser, PhD, Associate Professor, Geography & Geoinformation Science
<b>4. Project Title:</b>	"BRINGING 3D PRINTING INTO THE ENGINEERING CLASSROOM"
<b>Lead Proposer:</b>	David Lattanzi, PhD, Civil, Environmental & Infrastructure Engineering
<b>5. Project Title:</b>	"A TEAM OF INTERDISCIPLINARY FACULTY MENTORS PREPARE FUTURE STEM LEADERS THROUGH CUTTING-EDGE HANDS-ON RESEARCH EXPERIENCES"
<b>Lead Proposer:</b>	Lance Liotta, MD, PhD, Co-Director, Applied Proteomics & Molecular Medicine
<b>6. Project Title:</b>	"ASSESSING THE IMPACTS OF CONSERVATION ACTIONS ON THE POPULATION TRENDS OF ENDANGERED SPECIES"
<b>Lead Proposer:</b>	David Luther, PhD, Term Assistant Professor, Undergraduate Biology
<b>7. Project Title:</b>	"CALCULUS-BASED STEM LEARNING THROUGH THE ARTS"
<b>Lead Proposer:</b>	Evelyn Sander, PhD, Professor, Mathematical Sciences
<b>8. Project Title:</b>	"ADVANCING THE MENTORSHIP OF ACADEMIC-YEAR GOVERNOR'S SCHOOL (AYGS) STUDENT RESEARCH ACROSS VA: TEACHER PROFESSIONAL DEVELOPMENT FOR THE 19 VA AYGS AT FRONT ROYAL"
<b>Lead Proposer:</b>	Padmanabhan Seshaiyer, PhD, Professor, Mathematical Sciences
<b>9. Project Title:</b>	"STEM BOOT CAMP, IMPROVING ACCESS BY ENGAGING INCOMING STEM MAJORS"
<b>Lead Proposer:</b>	Padmanabhan Seshaiyer, PhD, Professor Mathematical Sciences
<b>10. Project Title:</b>	"ANTIMICROBIAL ACTIVITY IN THE BEDBUG, CIMEX LECTULARIUS"
<b>Lead Proposer:</b>	Monique van Hoek, PhD, Associate Professor, School of Systems Biology