College of Science
2010-2011 Annual Report
Lay Nam Chang, Dean
College of Science
2010-2011 Annual Report

Executive Summary

The FY2011 has been a remarkable one for the College of Science, not only in terms of attracting nineteen new faculty in interdisciplinary research areas, but also in the introduction of novel programs that integrate the discovery, learning and engagement missions of the college. While the Scorecard summarizes specific metrics in these areas, this report summarizes the overall accomplishments of the college. Notable highlights in 2010-11 include:

- COS faculty led the development of novel undergraduate programs in nanoscience, systems biology, neuroscience, and computational science as well as the development of an integrated science curriculum.
- Nineteen new faculty were hired in the cluster areas of Energy and the Environment, Neuroscience, Nanoscience and Visualization, Pattern Recognition and Data Analytics, and STEM education. There was a growth in research expenditures to $26,812,128, representing a 60% increase since cluster hiring was initiated in 2004.
- The Arlington Innovation Center for Health Research in the National Capital Region, was awarded $1M in new grants in FY11 with a grant for $7.1M on “neuropersonal imaging” in the final stages of negotiation. AIC:HR also took over the Biomedical Technology Development and Management program which offers an executive style M.S. degree from the Northern Virginia Center in Falls Church.

While we are on an upward trajectory, we have much to accomplish. Initiatives planned for the upcoming year include:
Continued growth and expansion of new undergraduate programs and to nurture extensions to interdisciplinary graduate programs, facilitated through IGEPs and IGERTs

Provide team-based mentoring and research opportunities that nurture the college’s cluster hires with the goal to increase the quantity and number of research awards

Develop career programs for mid- and senior-career faculty

Finalize the college of science’s strategic plan for 2012-18.

Introduction

This has been a seminal year of growth for the College of Science, along with advances and leadership in the domains of learning, discovery and engagement. This annual report documents some of the many accomplishments and contributions of our faculty, students, and staff to the college’s and university’s goals. We summarize our activities in Strategic Initiatives, Learning, Discovery, Engagement, Alumni Relations, Development, Communications, and Diversity. Individual achievements are noted in the Spotlights section with the final section of the report updating the college’s Scorecard for 2010-11.

Strategic Initiatives

Arlington Innovation Center (AIC)

The Arlington Innovation Center (AIC) for Health Research in the College of Science is a vanguard of integrated applied research that harnesses the power of informatics and systems science for innovative solutions to meet the challenges of healthcare in the 21st century. The AIC is organized to research critical problems in healthcare and healthcare delivery systems and to provide innovative solutions. It provides a forum for the science and engineering capabilities of Virginia Tech’s Blacksburg campus, VTCRI at Roanoke, the healthcare systems of Wake Forest and Carilion Clinic, and numerous industrial, hospital, and government partners in the National Capital Region.
Institute for Advanced Study

The Institute for Advanced Study (IAS) served as the site for cluster committee meetings and research gatherings for faculty members associated with established clusters—nanoscience, computational science, infectious diseases, developmental science, and complex systems. The IAS also provided the venue for the summit and development of new undergraduate degree programs in the college. The IAS continues to promote collaboration by faculty to plan and submit interdisciplinary grant proposals.

Pre-Intellectual Property and Patent Law

Over the last fiscal year, the College of Science’s Science & Law Program grew in two ways: firstly, a new coordinator of the science and law program, Anna-Marion Bieri has been hired. Secondly, a minor in Science, Engineering, and Law has been developed and two core courses of the minor, “legal foundations of Intellectual property” and “patent law” have been officially approved. The minor forms part of the new Scieneering program that Virginia Tech has created under the HHMI grant. In fall 2010, Michele Mayberry, owner of New River Valley Intellectual Property Law, Blacksburg, taught “Technology, Law, and Society,” and Anna-Marion Bieri taught a new class in “International Intellectual Property Law.”

Virginia Tech Carilion School of Medicine and Research Institute

The College of Science, along with several other colleges at Virginia Tech, is a collaborating partner in the development of the Virginia Tech Carilion School of Medicine and Research Institute. Located in Roanoke, the school of medicine recently recruited its first class of students in August 2010. Virginia Tech faculty members teach classes and work with VTCRI faculty on collaborative research proposals.

Michael Friedlander, Ph.D., was recruited from Baylor University to serve as Executive Director of the Virginia Tech Carilion Research Institute. Friedlander, a world renowned neuroscientist, was also appointed Professor of Biological Sciences. He has recruited several additional investigators including Read Montague (physics), Deborah Kelly (biological sciences), Konark Mukherjee (biological sciences), Pearl Chiu (psychology), and Brooks King-Casas (psychology).

Capital Projects

The Davidson Hall Renovation is underway and will provide new teaching and research laboratories. The project is projected to be completed in 2012 or early 2013. The Science Research Laboratory 1 has been delayed and a completion date is still pending.
Changes in College Leadership:

- Hans Haller, Chair of Economics, will complete his term and return to the faculty as professor of economics. Nic Tideman, professor of economics, is the new Department Chair.
- Tim Long, professor of chemistry, joined the Dean’s team to serve as the Associate Dean for Strategic Initiatives.
- Herve Marand, professor of chemistry, became the new Associate Chair of Chemistry.
- Robert Moore, professor of chemistry, was appointed as Interim Associate Director of Research at ICTAS.
- Janet Q. Sanders was appointed Assistant Dean for Finance and Administration.
- James Tanko, professor of chemistry, became the new Department Chair of Chemistry.
- Brenda Winkel, professor of biological sciences, became the new Department Head of Biological Sciences.

Learning – Undergraduate Studies

Laying the Foundations for STEM Education at Virginia Tech

The opportunities and challenges in STEM (science, technology, engineering and math) were headline news throughout 2010-2011. In a five-year follow-up to the landmark National Academies report “Rising Above the Gathering Storm,” the reassembled committee recently concluded that the United States continues to lose competitiveness in a global economy dominated by science and technology. They warn that we are “rapidly approaching category five” and look to higher education as one critical player in turning the tide. Governor McDonnell has concurrently placed a STEM initiative near the top of his agenda.

The College of Science (COS) at Virginia Tech is responding to this call. While continuing to meet the ever increasing demand for its foundational STEM courses for undergraduates across campus, COS is redesigning the curriculum to prepare its graduates to be global leaders of science and society. The commitment to our undergraduates across campus is exemplified by the college’s role in the Howard Hughes Medical Institute Science Education Grant in Scienceering ($1.4M). The American Physics Society teacher education grant ($300K) to make Virginia Tech part of the Physics Teacher Education Coalition (PhysTEC) effort to train high quality physics teachers indicates our commitment to future generations of STEM scholars through the K-12 pipeline.

The College of Science (COS) provides foundational science and math instruction to all undergraduates. During the 2010-2011 academic year, COS delivered 237,000 student credit hours in classroom and laboratory instruction, (26% of VT’s total). Since its inception in 2003, COS has experienced a 35% overall growth in its undergraduate majors. The Departments of
Biological Sciences and Psychology currently house the two largest undergraduate majors on campus with 1,654 and 1,097 majors, respectively. The student to faculty ratio in both of these programs is >45:1. Unrestricted enrollments in these majors present one of the college’s greatest challenges to providing the best possible training for undergraduates in STEM.

This growth, combined with that of other STEM colleges (Engineering, Agriculture and Life Sciences, and Natural Resources and Environment), has compelled basic science programs to meet increasing demand for science lectures and laboratories – a demand that spans freshman through senior level courses. Since 2003, the Departments of Biological Sciences, Chemistry, and Physics have experienced 40%, 35%, and 50% increases, respectively, in student credit hours (SCH) delivered. Much of this demand resides in resource-intensive laboratory instruction. While the university has provided additional, one-time annual funding each year, to meet these demands, the current mechanism necessitates that increased demand is met through courses taught by part-time instructors and graduate students, rather than by tenure-track faculty members.

Pathways to Success for First-Year Students: QEP

Despite the challenges of enrollment pressures, COS remains committed to the success of its students. The college has embraced the Quality Enhancement Plan (QEP) devised as part of VT’s reaffirmation of accreditation through SACS. The QEP, called Pathways to Success, is a plan to provide a first-year experience (FYE) for every incoming student at Virginia Tech. An FYE meets learning outcomes in problem solving, inquiry, and integration, essential for every
undergraduate and certainly tailor-made for a student in the College of Science. Since the Pathways program began, four FYEs have been funded in the College of Science: a Life Sciences program led by Biological Sciences, a Zip-line to Success program for all transfer students (primarily from the Virginia Community College System), and new programs starting this fall for incoming freshmen in the Departments of Psychology and Physics. The Zip-line team presented the findings from its program at an AAC&U conference on Engaged STEM Learning in Miami in March 2011 and has been invited to a transfer student meeting in Asheville, NC, this fall.

Enhancements to the Freshman Laboratories

Recognizing that a 21st century laboratory experience is increasingly computational and molecular (and thus increasingly costly in nature), the university approved an enhancement plan for the freshman level laboratories, funded by a modest student fee. Since this fee will not generate sufficient revenue to implement the planned changes for 5–10 years, COS has fronted several millions of dollars of new equipment to the participating departments. In the lab courses, our undergraduates will enjoy unprecedented hands-on access to major instrumentation early in their careers. For example, the general chemistry lab will use gas chromatography (GC)/mass spectroscopy (MS) to teach important concepts pertaining to isotopes and separations. The Chemistry department will be the first in the nation to offer this level of hands-on experience in an introductory chemistry lab class. In the organic labs, majors have always had access to NMRs in Syn-Tech lab (BS chemistry major lab). Starting this fall, BA majors and non-majors will enjoy the same experience in the form of an undergraduate NMR lab, with a 400 MHz NMR as the centerpiece. The Physics department has purchased two new telescopes, one an upgrade for the Prices Fork observatory and a second, 14-inch telescope for a new observatory to be located right on campus. The Geosciences department has purchased an OmniGlobe, a three-dimensional system to display global data including climate and weather. Parents and students across campus were alerted to these fees and enhancements during freshman orientation. In the COS, the overall response was enthusiastic.

New Undergraduate Programs

The College of Science has embraced a bold vision to revitalize undergraduate STEM education with interdisciplinary programs that adopt a student-centered approach to learning and emphasize undergraduate research. The newly developed Actuarial Science minor will be joined by a minor in Science, Technology and Law (part of the Howard Hughes Medical Institute Scieneering program) as options for students across campus. In addition, four new undergraduate degrees and a foundational program will be submitted for approval this year.

Our vision is that VT students will learn science the way we practice science - as creators of new knowledge, through interdisciplinary thinking, and as members of a professional community. As the foundation of the undergraduate science program, we will develop an integrated science curriculum (ISC) that spans the first two years of learning. Students will then matriculate to
undergraduate degree programs including new programs in systems biology, neuroscience, nanoscience, and computational science. All programs will require substantial undergraduate research giving them full advantage of a Research I university. With these four degrees in place and the innovative foundational curriculum in place, VT will become an international leader in STEM education.

**Integrated Science Curriculum** – The integrated science curriculum will serve as one gateway for all four new undergraduate degree programs as well as participating existing majors in the college. Rather than experiencing foundational subjects for a science program as segregated canons (e.g., Biology, Chemistry, Mathematics, Physics, Statistics, and Computer Science), undergraduates will enroll in an eight-credit course each semester for the first four semesters where these subjects are integrated, centered around problems that require application of each area. The pedagogy for this course will incorporate student-centered, active-learning models such as the SCALE-UP classes that are currently taught in the College of Science. The integrated science curriculum will emphasize learning outcomes in computation and high performance computing, which are not part of many of our current programs but have become critical for almost all areas of science.

**Systems Biology** – Systems Biology is becoming one of the hottest areas of life science research, as witnessed by the growing number of graduate programs in systems biology at major universities, of new research institutes in systems biology being established worldwide, of new funding opportunities at NIH, NSF, DOE and private foundations, and of employment opportunities for systems biologists at biotech startups and big pharmaceutical companies. Nonetheless, a Google search reveals only a single undergraduate degree program anywhere in the world (UCLA). This gap will soon be filled by colleges and universities that aspire to lead the nation in educating the next generation of systems-thinking life scientists. VT has the expertise on campus to be a strong contender in this arena, if we move quickly.

**Nanoscience** – Understanding phenomena at the nanometer dimension has catalyzed emerging technologies in our society, ranging from biomedical imaging to water desalination. Fundamental advances in this field demand an understanding at the molecular level and self-assembly processes that generate novel structure and morphology. Industrial leaders require future scientists with this interdisciplinary understanding, and future entrepreneurs will benefit from a molecule to device perspective. This integrated perspective only is achieved when chemistry, physics, biology, and mathematics uniquely come together to explain phenomena at the nanoscale. Nanoscale technologies will also require a critical
assessment of the societal and environmental implications, and correlation of public perception with science is paramount to ensure success.

**Neuroscience** – While undergraduate neuroscience programs has existed for some time (e.g., at Johns Hopkins and Virginia), unmet demand persists. Among the prospective students who visit the COS information sessions, neuroscience is the most frequently requested degree program that we do not offer. Neuroscience is an emerging research cluster at VT bolstered by outstanding faculty at VTCRI and the National Capital Region.

**Computational Science** – As the third pillar of scientific discovery, computational science complements theory and experiment by finding meaningful patterns in massive data sets and by simulating complex phenomena ill-suited to physical experimentation. Large corporations to government research laboratories to start-up companies rely on computational science for everything from the management of industrial processes, to drug development, to the next innovation in the knowledge economy. Computational science students will learn fundamental programming, mathematical, and statistical principles by solving problems from various disciplines and applications. In classwork, research experiences, and internships, students will experience computational science in the collaborative, problem-driven settings characteristic of the organizations working today to shape the future.

**New courses and approaches** – The more traditional disciplines within COS have implemented curricular and pedagogical innovations. The first undergraduate CLE signature experience at VT was the Introduction to Astronomy experience offered to approximately 600 students by Physics department faculty member Nahum Arav. Neil Johnson and John Chermak in the Geosciences department are developing a CLE signature sequence that focuses on resources and the environment. The Department of Biological Sciences has developed a host of new undergraduate courses including: Global Change Ecology taught by Jeb Barrett, Research Skills taught by Lisa Belden, Wildlife Disease Ecology taught by Dana Hawley, Advanced Proteomics and Biological Mass Spectrometry taught by Iuliana Lazar, Inflammation Biology taught by Liwu Li, and Advanced Terrestrial Plant Ecology taught by Erik Nilsen. In addition, the college has...
adopted many of its courses for the SCALE-UP classroom in Derring. Courses taught there in 2010-2011 include the Zip-line Seminar for Transfer Students, Cell and Molecular Biology, Geosciences Fundamentals, and Genes, Mind and Culture. This fall, courses in Physics will also be taught in SCALE-UP. The Economics department continues to utilize technology to engage students in the classroom including the use of iClickers by Steve Trost who teaches Principles of Economics and the use of the WITS electronic system to conduct real-team experiments with students in Microeconomic Theory.

Virginia Tech joined the APS teacher education project (June 6, 2011). The MOU and budget details are currently being negotiated. The goal of the project is to increase the number of highly qualified high school physics teachers, through increased recruitment of students into the physics major, early field experiences (with the Physics Outreach Team and the Montgomery County Schools Robotics Program), early courses in pedagogy, and intense mentoring during the early years of high school teaching. It is the first program of this kind in Virginia. Of the 70 letters of intent invited for full proposals, only five sites have been funded. Of these five sites, three (including Virginia Tech) will implement a wide range of activities while the remaining two are targeted on specific aspects of teacher education.

2010-2011 Undergraduate Student Honors and Awards

**VT Undergraduate Man of the Year**

**Ryan A. Anderson**

**Biological Sciences**

**Barry E. Goldwater Scholar and ACC Undergraduate Research Scholar**

**Charles Baker**

**Physics, Biological Sciences, and Mathematics**

**Outstanding Graduating Senior in the College of Science**

**Matthew Ning**

**Biochemistry and Psychology**
2010-2011 Undergraduate Student Honors and Awards (continued)

ESPN First Team Academic All-American
JENNIFER HARVEY
CHEMISTRY

ACC Undergraduate Research Scholar
SARA WEBSTER
BIOLOGICAL SCIENCES

College of Science
Outstanding Undergraduate Research Award
and
2011 Phi Kappa Phi Outstanding Senior for the College of Science
SIDDHARTH VENKAT
PHYSICS

PATRICK O’NEIL AND WILL FREY PRESENT THEIR PAPER AT THE MATHEMATICAL CONTEST IN MODELING

The team of Will Frey, Patrick O’Neil, and Evan Menchini, all of Mathematics, earned a score of “Outstanding” in the Mathematical Contest in Modeling (MCM), sponsored by COMAP (the Consortium for Mathematics and Its Applications). Of the 2,775 entries in this international contest, only eight received the highest ranking of “Outstanding.”

Will, Patrick, and Evan also were the MAA Prize recipients for the VHF Network Problem on which about 1,500 teams worked.
2010-2011 Teaching and Advising Awards

**Alumni Award for Excellence in Undergraduate Academic Advising**

**JACK EVANS**
BIOLOGICAL SCIENCES

**College of Science Certificate of Teaching Excellence**

**IGNACIO MOORE**
BIOLOGICAL SCIENCES

**William E. Wine Award**

**LEO PILONEN**
PHYSICS

**Alumni Award for Excellence in Teaching and College of Science Certificate of Teaching Excellence**

**RICHARD WALKER**
BIOLOGICAL SCIENCES
Learning – Graduate studies

Graduate Students: Metrics

Following university goals in graduate education, all departments are working to increase the number and quality of Ph.D. students. In Fall 2010, there were 595 graduate students enrolled in the College of Science, the same as last year. Of these, 497 were Ph.D. students and 98 were M.Sc. students (see chart below). These numbers have remained constant since 2009-2010 even though the number of tenure-track faculty dropped from 201 to 180 during this period. It is noteworthy that there has been a remarkable growth in the number of doctoral students from 2003 when 256 Ph.D. students were enrolled in the College of Science, an increase of 48%.

Interdisciplinary Graduate Programs

The College of Science is a leader in developing interdisciplinary graduate education programs. Such programs span traditional departmental boundaries and allow students enrolled in a program to study with faculty from many departments and colleges.

- Judy Riffle (chemistry) is director of the Macromolecular Science and Engineering graduate degree (MACR) which is a university-based degree program spanning multiple departments and colleges to emphasize fundamental and emerging technological areas.
in the field of macromolecular science and engineering. In 2011, MACR was awarded support under the new Interdisciplinary Graduate Education Program (IGEP).

- Faculty from Biological Sciences are key members of the interdisciplinary Ph.D. program in Genetics, Bioinformatics, and Computational Biology (GBCB). This exciting program of study encompasses applications of molecular biology, genomics, mathematics, statistics and computer science to all areas of the life sciences. GBCB was also awarded support under the new Interdisciplinary Graduate Education Program (IGEP).

- Faculty from the college have also been very successful in developing Integrative Graduate Education and Research Training (IGERT) grants funded by the NSF. The competition for these five-year programs is intense with only a handful of programs selected from several hundred applications. The “Multi-Scale Transport in Environmental and Physiological Systems” (multiSTEPS) was approved for funding in 2010. Jeffrey Kuhn (biological sciences) is a co-PI on this proposal and Brenda Winkel, Jianhua Xing and Zhaomin Yang (all of biological sciences) are participants. MultiSTEPS was also awarded support under the new Interdisciplinary Graduate Education Program (IGEP).

- Dorothea Tholl and Brenda Winkel (both in biological sciences) are participants in the Translational Plant Science (TPS) IGEP and Michael Hochella (geosciences) is a leader in the Sustainable Nanotechnology (SuN) IGEP.

The College of Science is committed to developing and supporting interdisciplinary graduate research and training programs. Our vision is that the new undergraduate programs in systems biology, neuroscience, nanoscience, and computational science will develop into graduate programs. With these four degrees in place and the innovative foundational curriculum in place, COS will provide a continuum of learning from the undergraduate level through the graduate level.

**M.S. Degree in Biomedical Technology Development and Management (BTDM)**

Kenneth H. Wong was named Director of the Biomedical Technology Development and Management program in September 2010, which offers an executive style M.S. degree from the Northern Virginia Center in Falls Church. The program is a collaborative effort between VT and Georgetown University. The BTDM program and the College of Science are developing new courses including:

- A course in “Legal and Ethical Issues for High Tech Environments”, taught by Anna Marion-Bieri. Blacksburg-based students in the COS were offered the ability to participate in the course via video conference.

- A medical imaging/medical devices course suitable for cross listing with other departments such as Physics.
Additional collaborative efforts are in development with The George Washington University to share resources and class offerings with their Master of Professional Studies in Molecular Biotechnology, as well as combined networking and guest lecturer events.

During the 2010-2011 academic year, BTDM graduated its first class of eight students. Six students are currently enrolled in the program; our goal is to reach a steady state enrollment of 20-25 students.

Enhancing Graduate Student Recruitment and Training

Faculty in the College of Science led recruitment efforts to increase the quality, diversity, and reputation of research programs.

- Biological sciences faculty maintained leadership in three university-wide graduate recruiting programs: (1) The Interdepartmental Microbiology Graduate Program (IMGP) (http://www.biol.vt.edu/vtmicro/g_study.html) includes over 40 faculty participants from across the university. Students who apply and are recruited spend their first semester rotating through laboratories before the decision is made on a major advisor; (2) The Graduate Program in Molecular Plant Sciences (MPS) (http://www.molplantsci.org.vt.edu/INDEX.HTM) involves 20 participating faculty from seven departments - this coming year marks the fifth year of an aggressive recruiting effort at regional schools, followed by students rotating through labs before a decision is made on a major advisor; and (3) The Graduate Program in Cell and Developmental Biology (CDB) (http://www.biol.vt.edu/research/cdb/index.html) includes 11 participating faculty. Fifteen students have been recruited and 14 are currently active. Following the model of the Microbiology program, students in the CDB rotate among faculty mentors before being accepted into a particular lab.

- The college and departments support three 4-year ICTAS Graduate Scholarships per year to recruit the best and brightest graduate students to Virginia Tech. There are now 11 ICTAS Graduate Scholars in the College of Science and two more will join the cohort in Fall 2011.

- Departments host “open days” and other such events to showcase the quality of their graduate programs and to help recruit the best students. John Morris (chemistry) organized the department’s annual graduate recruiting weekend in March 2011. Physics held its annual on-campus Preview Weekend for prospective graduate students in February 2011. The date was chosen to coincide with the Graduate School Preview Weekend and students participate in various activities at the Graduate School and in the department. Typically as much as fifty percent of the prospective graduate students attending this event accepted offers to join the department this coming fall.

- Departments also target professional meetings to recruit the best and brightest graduate students. Faculty members in the Department of Geosciences, for example, set up special student recruiting and information booths at the following professional meetings: Southeast Section of Geological Society of America, Society of Exploration
The College of Science is also committed to enhance the quality and breadth of graduate education and training:

- Biological Sciences entered the sixth year of the “Preparing the Future Professoriate” project. Graduate students who wish to build a strong resume in teaching and in preparation for academic careers can participate in a graduate school certificate program that includes a course in pedagogy or teaching at the college level, and an opportunity to teach a lecture course in the department under the mentorship of a faculty member.

- Geosciences initiated a graduate student orientation program that occurs the first week before the semester starts in August that includes a presentation of expectations of graduate students, scientific culture and ethics, and career paths for graduate students.

- An important aspect of graduate training is to have students present their research results during “research days” and other such events. Biological Sciences presented their 8th Annual Research Day in February 2011. This program, directed by and for graduate students, is modeled after professional conferences with poster sessions, presentations, and a plenary talk. An abstract book was published on the web, and over 125 people attended the meeting, including several from the Biological Sciences Alumni Advisory Board. Geosciences held its 16th annual Geosciences Student Research Symposium in March 2011. This is a two-day event organized by graduate students and where the students present 15-minute talks in a format similar to that found in a professional meeting. An abstract volume is published as well.

- Statistics has a very active consulting center with faculty from the entire campus visiting the Laboratory for Interdisciplinary Statistical Research (LISA) throughout the year. All students are trained in consulting via coursework and practical experience; each MS student must work in LISA for at least one semester for a minimum of five hours per week.

Enhancing Graduate Student Support

Both internal and external scholarships are important mechanisms to not only recruit top-quality graduate students, but also to promote graduate programs of excellence within the college. In addition to the internal scholarships mentioned above, COS has attracted graduate students fully funded on the prestigious NSF Graduate Research Fellowships, NSF IGERT Fellowships, Department of Defense SMART scholarships, Smithsonian Fellowships, and several scientific society fellowships.

In addition, connections external to academe are becoming increasingly important in graduate training. The college has programs that build on successes in corporate sponsorships and internships for graduate programs.
• Statistics’ Corporate Partners Program, which includes companies such as BD, Capital One, DuPont, GE, JR Research, Lilly, Minitab, Pratt & Whitney, RJ Reynolds, and SAS, sponsor student recruitment activities and scholarships. The Corporate Partners, and other companies, visit Statistics regularly and the students are among their top choices for recruiting new hires and interns.

• Psychology’s internship component involves strong and abiding relations with institutions such as the Devereux Institute in Pennsylvania. Such internships place students in competitive positions for appointments after graduation. In 2010-11, six students received clinical internships.

• There are also opportunities for some graduate students to complete parts of their training at off-campus sites such as Oak Ridge National Laboratories, Georgetown University, the Howard Hughes Institute, and USGS. The National Capital Region (NCR) will provide new opportunities for graduate students by accommodating some of the off-campus training opportunities mentioned above.

Endowments provided by loyal alumni are also providing scholarships that enhance the graduate programs in the college. The College of Science’s alumni advisory group, the Roundtable, established the Make-a-Difference Scholarship for Graduate Study in the College of Science. Four awards totaling $11,000 are awarded each year to graduate students who will make a significant difference to the College of Science and the world outside the university.

2010-2011 Graduate Student Honors and Awards

<table>
<thead>
<tr>
<th>2011 Graduate Woman of the Year</th>
<th>COS Outstanding Doctoral Student</th>
<th>COS Outstanding Master’s Student</th>
<th>Graduate Teaching Assistant Excellence Merit Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amanda Rumore</td>
<td>Philip Prince</td>
<td>Michael Painter</td>
<td>Kristin Dorfler</td>
</tr>
<tr>
<td>BIOLOGICAL SCIENCES</td>
<td>GEOSCIENCES</td>
<td>BIOLOGICAL SCIENCES</td>
<td>GEOSCIENCES</td>
</tr>
</tbody>
</table>

Kristy Benoit, Psychology, 2011 Roundtable Graduate Scholar, receives award from Associate Dean Nancy Ross
Graduate Service Excellence Merit Certificate

Ryan Smith
Psychology

Outstanding Dissertation Honorable Mention

Jared Heffron
Biological Sciences

Governor’s Volunteerism and Community Service Award

Brittany Gianetti
Biological Sciences

American Geophysical Union Congressional Science Fellowship

Rebecca French
Geosciences

Who’s Who Among Students in American Universities and Colleges

Amanda Rumore
Biological Sciences

Jonathan Rey Moore
Biological Sciences

Fulbright Scholarship

Bonnie Fairbanks
Biological Sciences

College of Science Dean’s Roundtable Scholarship for Graduate Study

Recipient

Kristy Benoit
Psychology

Finalist

Ellen Green
Economics

Finalist

Youyi Ruan
Geosciences

Finalist

William Silkworth
Biological Sciences
Discovery

Building Interdisciplinary Teams through Cluster Hiring

Since its establishment in 2003, the College of Science has strived to foster the development of interdisciplinary research, education and outreach programs. Cluster hiring was implemented by the College of Science in 2004 to attract the best scholars, to promote diversity and to drive the development of interdisciplinary research teams. The initial hires in the college focused on four cluster areas: nanoscience, computational science, infectious diseases and human development across the lifespan. The selection of the cluster themes was based on criteria that ensure an inclusive paradigm, where research excellence in the interdisciplinary theme would have significant impact beyond the College of Science. The four themes listed above are evident as overarching to many of the subsequent themes that have emerged. In addition, all clusters in the College of Science align strongly with Virginia Tech’s strategic plan. Nanoscience and computational science are critical components of the university’s discovery domain of Innovative Technologies and Complex Systems while infectious diseases and human development across the lifespan provide critical components within the discovery domain of Health, Food and Nutrition as well as Social and Individual Transformation. In 2006, the college expanded cluster hiring based on proposals from faculty to include visualization and pattern recognition and data analytics (VPR-DA) which aligns with Innovative Technologies and Complex Systems, and integrated studies of earth systems (ISES) which aligns with Energy, Materials and Environment. VTCRI accelerated growth in the emerging cluster of neuroscience which aligns with Health, Food and Nutrition. These areas build on strengths both within the College of Science and across the University and thus will help sustain a critical mass from which to foster collaborations with other colleges, the research investment institutes, the school of medicine and beyond.

In 2010-2011, the college successfully attracted nineteen new faculty spanning the following cluster areas:

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>COS Cluster /Discovery Domain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam Dominiak</td>
<td>Economics</td>
<td>Energy and the Environment</td>
</tr>
<tr>
<td>Amanda Morris</td>
<td>Chemistry</td>
<td>Energy and the Environment</td>
</tr>
<tr>
<td>Bryan Brown</td>
<td>Biological Sciences</td>
<td>Earth Systems/Energy and the Environment</td>
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<tr>
<td>Adi Livnat</td>
<td>Biological Sciences</td>
<td>Earth Systems/Energy and the Environment</td>
</tr>
<tr>
<td>Mark Caddick</td>
<td>Geosciences</td>
<td>Earth Systems/Energy and the Environment</td>
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<td>Esteban Gazel</td>
<td>Geosciences</td>
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<td>Benjamin Gill</td>
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<td>Brian Romans</td>
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<tr>
<td>Robert Weiss</td>
<td>Geosciences</td>
<td>Earth Systems/Energy and the Environment</td>
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<tr>
<td>Megan Wawro</td>
<td>Mathematics</td>
<td>STEM Math Education/Social and Individual Transformation</td>
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<tr>
<td>Name</td>
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<td>COS Cluster /Discovery Domain</td>
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<tr>
<td>Tijana Grove</td>
<td>Chemistry</td>
<td>Nanoscience/ Innovative Technologies and Complex Systems</td>
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<tr>
<td>Chenggang Tao</td>
<td>Physics</td>
<td>Nanoscience/ Innovative Technologies and Complex Systems</td>
</tr>
<tr>
<td>Anthony Cate</td>
<td>Psychology</td>
<td>Neuroscience/ Health, Food and Nutrition</td>
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<td>Rachel Diana</td>
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<td>Jie Li</td>
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<td>John Richey</td>
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<td>Stanca Ciupe</td>
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<td>Xinwei Deng</td>
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<td>Leonardo Mihalcea</td>
<td>Mathematics</td>
<td>Visualization &amp; Pattern Recognition/ Innovative Technologies and Complex Systems</td>
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**Scholarship**

Scholarly publications and presentations at scientific conferences are a measure of the productivity and impact of our faculty. This year, the college implemented a system to track publications and presentations for the CY from Jan. 1, 2010-Dec. 31, 2010. The results are summarized below:

- 866 articles published in peer-review journals (+ 122 publications in press)
- 34 book chapters (+31 chapters in press)
- 3 books
- 225 invited presentations, with >1000 additional presentations

Among these, David Kingston’s (chemistry) article “Modern Natural Products Drug Discovery and Its Relevance to Biodiversity Conservation”, published in March 2011, was one of the top ten most-accessed articles in the Journal of Natural Products in the last 12 months, and the third most-accessed article in March 2011. Giti Khodaparast (physics) and Jill Sible, professor of biological sciences and Associate Dean for Curriculum, Instruction, and Advising, have been collaborating in delivering nanoparticles to cells using a near infrared laser technique. One of the resulting tadpoles is featured on the cover of the May 2011 issue of *Biotechnology Journal*! The lead author of the project is Jose Umanzor-Alvarez (physics class of 2010).
Research Awards and Expenditures

The College of Science achieved a record-high growth in research expenditures in 2010-2011 totaling $26.8M in FY11, a 4.8% increase from FY10, $25.5M. The number of awards, $25.3M, however, showed a decrease from the record-high level of last year, $32.0M. In addition, the total number of awards, 264, dropped from the previous year, 276, and the amount per faculty decreased from an average value of $116,880 to $96,111. The college is experiencing the effects of little hiring in FY09 and no hiring in FY10 due to budget reductions. Many faculty retired in FY10 which not only reduced the number of tenure-track faculty from 202 to 180 but also placed additional burden to meet the teaching needs of the college. Given these facts, it is noteworthy that since the College of Science was formed in 2003, the research expenditures have increased 60% and the research awards have increased by 54%. During this period, the average amount per award has grown from $80,715 to $96,111.

Notable Research Awards

Many of the notable research awards have been listed in previous sections. Summarized below, are highlights of early career awards from cluster hires, and notable awards in the cluster areas of computational science, energy and the environment, nanoscience, and STEM education.
Early Career Awards

- Carla Finkielstein (biological sciences) continuing NSF CAREER Award: “Circadian Control of Cell Division and Homeostasis” (2009-2014), $1,081,348.
- Patrick Huber (physics): U.S. Department of Energy, Office of High Energy Physics, Early Career Research Award (ECRA), “Neutrinos in the Universe,” (2010 –2015), $750,000 for five years, PI (100%). This is an extremely competitive young investigator award and DOE’s equivalent of NSF’s CAREER program with 69 awards out of 1750 applications.
- Jon Link (physics): continuing DOE Outstanding Junior Investigator Award, “Experimental Studies in Neutrino Masses and Mixing Angles,” funded at $360,000 (2008-2012). The OJI program was DOE’s equivalent of the NSF’s CAREER program until 2009 when the ECRA program was launched.

Computational Science

- Daniel Crawford (chemistry) received funding from the National Science Foundation in the amount of $2M, for “MRI-R2: Acquisition of a Heterogeneous Supercomputing Instrument for Transformative Interdisciplinary Research.” He will have access to the new machine, which is GPU-based and called “HokieSpeed.”
- Khidir Hilu (biological sciences), co-PI, $1.99M total, “Acquisition of a heterogeneous supercomputing instrument for transformative interdisciplinary research,” National Science Foundation MRI-R2.
- Scott King (geosciences) was awarded $480,000 from the NSF CSEDI program to study the “Dynamics of subducted slabs in the transition zone”
• Edward Valeyev (chemistry) received a four-year NSF grant ($400,000) to work with collaborators at Stanford and Iowa State to develop sustainable software infrastructure for electronic structure theory.

• Chet Weiss (geosciences) was awarded $464,000 from the NSF CSEDI program to study “Coupled Electromagnetic and Geodynamic Study of Thermochemical Piles,” 2010-2013.


• Ying Zhou (geosciences) has several awards from NSF totaling $690,000 to study the elastic structure of the Earth’s mantle.

Energy and the Environment

• Jeb Barrett (biological sciences) was awarded $198,768 of $388,251 total, from the National Science Foundation for “Collaborative Research: Control over the spatial distribution and activity of microbial communities in Antarctic soils.”

• Bob Bodnar (geosciences) was awarded $437,000 from Virginia Uranium for “An Integrated Geological, Geochemical, Geophysical and Hydrologic Study of the Coles Hill Uranium Deposit, Pittsylvania County”.

• Dana Hawley (biological sciences), $56,805 (of $1,730,359) was awarded a grant to study the “Ecological consequences of the Kingston, TN ash spill on aquatic and terrestrial consumers,” Tennessee Valley Authority.

• John Hole (geosciences) has over $2.4M in awards from the NSF to study seismic imaging of the Earth’s crust.

• Louis A. Madsen (chemistry) received a three-year NSF grant ($324,000) to investigate dynamic ion-transport behavior in supramolecular materials with long-term applications in organic batteries and fuel cells. This work is part of an IUPAC-affiliated collaboration with Profs. Martin Moller (synthesis -- Aachen, Germany) and Dimitri Ivanov (structural characterization -- Mulhouse, France).

• James E. McGrath (chemistry) was one of ten winners of the Chief of Naval Research Challenge, a competition organized by the Office of Naval Research to identify research programs with the strongest potential to meet the current and future technological needs of the US Navy. Dr. McGrath and his co-workers in the Chemistry Department and the Macromolecules and Interfaces Institute (MII) will use the $100,000 award to investigate chlorine-resistant membranes for reverse and forward osmosis, nanofiltration, and waste water purification.

• John R. Morris (chemistry) received a grant from the National Science Foundation for molecular beam studies of surface chemical reactions. The $430,000, three-year award will help Dr. Morris and his co-workers further molecular level understanding of how common atmospheric pollutants react on surfaces of environmentally important organic materials, including surfactant-coated water droplets or aerosols, soot particles, and polymers.
Nanoscience

- Daniela Cimini, $349,998 (of $1,050,000 total), “Molecular architecture and mechanical properties of the kinetochore: a biophysical approach,” Human Frontier Science Program.
- Patricia Dove (geosciences) has continued funding totaling $2.1M from the DOE for “Investigation of the physical basis for biomineralization.”
- Carla Finkielstein (biological sciences) a leader on a $6.5M grant from NIH/National Cancer Institute, for the project “Appalachian Community Cancer Network II.”
- Mike Hochella (geosciences) has a continuing award of $1.13M from the DOE to study “Dissolution Rates and Sorption/Catalytic Reactivity of Nanominerals and Nanomineral Aggregates.”
- Professors Webster L. Santos (chemistry), Hans Robinson (physics), and Richey M. Davis (chemical engineering) received a three-year NSF grant ($500,000) to develop methods of assembling complex nanostructures. The project aims to demonstrate a new class of "patchy particles" having surfaces patterned with discrete interaction sites that attract or repel complementary sites on other particles. The long-term objective is to guide the self-assembly of complex structures with high precision and in high yield.
- Webster L. Santos (chemistry) and collaborator David Rekosh (University of Virginia) received a five-year research grant from the National Institutes of Health in the amount $1.58 million to develop cell permeable, medium-sized molecules that target RNA structures essential for the HIV-1 life cycle. The research could lead to HIV/AIDS therapies.

STEM Education:

- Working with Associate Dean Jill Sible (COS), Gary Long (chemistry) was co-PI on an NSF STEP proposal entitled “Increasing STEM graduates in the physical and quantitative sciences at Virginia Tech.” The requested budget for this initiative was $1.9 M for five years, and the goal is to increase the number and diversity of STEM graduates in the COS through retention strategies that promote academic success and engagement with the scientific process and community.

Faculty Awards and Honors

College of Science faculty are also recognized by many prestigious awards and honors as featured in the Spotlights section. Among the notable awards from external sources:

- Ross J. Angel (geosciences) received a prestigious Mercator Professorship, Germany.

- Nahum Arav (physics) was awarded a prestigious Lady Davis fellowship, supporting a 3 months visit to the Technion, Israel for summer 2011; delayed until summer 2012 for family reasons.
Martha Ann Bell (psychology) received an Outstanding Scholar Alumni Award from the University of Maryland.

Ezra Brown (mathematics) received the Mathematical Association of America’s 2010 Carl B. Allendoerfer Award for Excellence in Expository Writing (with Keith Mellinger), for “Kirkman’s schoolgirls wearing hats and walking through number fields,” Mathematics Magazine, vol. 82, (February 2009), pp. 3-15.

Thomas Burbey (geosciences) was named a Fulbright Scholar to France, August 2010 to January 2011.

John Burns (mathematics) was awarded the 2010 W.T. and Idalia Reid Prize in Mathematics by the Society for Industrial and Applied Mathematics.

Martin Chapman (geosciences) was chosen Vice-President of the Eastern Section of the Seismological Society of America and will become President (two-year term) in 2011.

Harry C. Dorn (chemistry) was appointed as the Dr. A. C. Lilly, Jr. Faculty Fellow of Nanoscience. This endowed fellowship was established to provide support for an outstanding faculty member in the College of Science whose research is primarily in the nanoscience area. Dr. Dorn is known worldwide as a leader in carbonaceous nanomaterials including endohedral metallofullerenes and related species.

Patricia Dove (geosciences), elected a Fellow of the Geochemical Society and European Association of Geochemistry, was invited to present the Ingerson Lecture, Geochemical Society, Denver, and was appointed C.P. “Sally” Miles Professor of Science.

Carla Finkielstein (biological sciences) American Association for Cancer Research Minority Scholar Award in Cancer Research, National Breast Cancer Scholarship

Scott Geller (psychology) received an Outstanding Applied Research Award from Division 25 of the American Psychological Association and was elected Fellow of the Association for Behavior Analysis International.

George Hagedorn (mathematics) was a nominee for the Dannie Heineman Prize for Mathematical Physics (administered jointly by the American Physical Society and the American Institute of Physics).

Michael Hochella (geosciences) was chosen as the President-elect of the Mineralogical Society of America (2011-2012) and presented the invited Adrian Smith Annual Lecture, University of Waterloo, Ontario, Canada, 2010.

Michal Kowalewski (geosciences) was chosen as a Fellow of the Geological Society and presented the invited Keynote for the 2010 German Paleontological Congress, Münich, Germany.
Prof. Timothy E. Long (chemistry) received the 2011 Mark Scholar Award from the American Chemical Society. This national award, named for legendary polymer scientist Herman Mark, recognizes Dr. Long’s achievements in polymer synthesis and characterization for emerging technologies, including engineering thermoplastics, functional surfaces, fibers, and nanostructures. His interdisciplinary research approach interfaces developments in polymer science with biology and engineering. Professor Tim Long also received the 2011 PMSE Cooperative Research Award (shared with Kraton Polymers).

Prof. Leo Piilonen (physics) was appointed the William E. Hassinger, Jr. Senior Faculty Fellow in Physics.

Prof. Judy S. Riffle (chemistry) was named a Fellow of the American Chemical Society Polymer Division. POLY is the second division (after PMSE) to have bestowed this title upon Dr. Riffle. The award recognizes her many contributions to research and education in polymer science, as well as her long record of service to the Division.

Professor Webster L. Santos (chemistry) was appointed the Blackwood Junior Faculty Fellow of Life Sciences. This fellowship was established to support and advance instruction, research and collaboration in the life sciences, with a complementary focus on the development of entrepreneurial opportunities. Dr. Santos’s research focuses on the design of cell permeable RNA ligands as anti-HIV therapeutics and the development of sphingosine kinase inhibitors for the treatment of hyperproliferative diseases such as cancer.

Prof. Beate Schmittmann (physics) received the Beams Medal of the Southeastern Section of the American Physical Society. The citation read: “For deep and pervasive contributions to nonequilibrium statistical mechanics and its applications and for inspiring world-class research in the southeastern United States.”

John Tyson (biological sciences) Society of Mathematical Biology Arthur T. Winfree Prize

G. Geoffrey Vining, professor of statistics in the College of Science has been awarded the Shewhart Medal from the American Society for Quality. The medal is the highest award for technical leadership in the field of quality control. It is presented annually to an individual who has made the most outstanding contributions to the science and techniques of quality control or who has demonstrated leadership in the field of modern quality control.

Shuhai Xiao (geosciences) was awarded the Guggenheim Fellowship for 2010-2011 and was the invited chair at the Kavli-US-China Frontier of Science.
Engagement

The College of Science is committed to engaging its intellectual assets to address economic and social needs of communities around the commonwealth, the nation, and the world. Faculty members and students in the College of Science are extensively involved in outreach and service. The involvement ranges from interactions with K-12, to short courses and workshops for students and professionals, to newsletters and media presentations, and to service in professional societies, governmental and non-governmental agencies. Faculty members in the college hold more than 100 editorships or associate editorships on professional journals and many serve on editorial boards. Faculty members also serve on numerous review panels at federal agencies and foundations for grant selection.

Economic Vitality

The College of Science connects innovations in the scholarship of learning, discovery, and engagement to the economic well-being of individuals, families, businesses, and communities. Central to this goal are entrepreneurial initiatives advancing technology transfer, intellectual property, and the transfer of knowledge in domestic and international partnerships.

- In FY11, faculty in Chemistry and Physics filed 5 patents.
- Karen Brewer (chemistry) received an award totaling $360,000 over two years from Phoenix International Energy, Inc. for her work on “A System for Light Driven Production of Hydrogen from Water.”
- The Virginia Tech Crystallography Laboratory has been the North American reference site for Oxford Diffraction Ltd., now merged with Agilent, since 2002. This fruitful partnership has leveraged new instruments and upgrades from ODL worth $2.7M with full service and warranty contracts and cash sponsorship totaling an additional $100,000 per annum.
- The Department of Statistics continued its very successful Corporate Partners program which includes the following companies: Becton Dickenson, Capital One, DuPont, Eli Lilly and Company, General Electric, J.P. Research, Minitab, Pratt and Whitney, R.J. Reynolds, SAS.
- Randy Heflin (physics) served as a member of the Scientific Advisory Board of Techulon, Inc. Techulon is a private technology transfer initiative providing start-up support and venture capital to support commercialization of intellectual property.
- Oil and gas as well as precious and base metal companies continue to recruit in the Department of Geosciences, including Exxon Mobil, BP, Cabot Oil and Gas, Chevron, Conoco Phillips, Hess, Stillwater Mining, Riotinto Mining, Baker Hughes, and Schlumberger. The Department of Geosciences also received scholarship and field trip support in the amount of $96,000 from ConocoPhillips, BP, Petroleum GeoServices and Matt Mikulich.
PK-12 Education in Science, Technology, Engineering, and Mathematics (STEM)

This goal is achieved through multi-disciplinary research partnerships, teacher preparation, professional development opportunities for PK-12 educators, and programs connecting PK-12 to STEM undergraduate programs.

The Center for Talented Youth (CTY) is one way the College of Science and the College of Engineering are addressing STEM education by getting students interested in science and technology fields at a young age. The program, which is run through Johns Hopkins University, provides extracurricular opportunities for highly motivated middle- and high-school students who are passionate about learning.

As a host school, Virginia Tech oversees the event as 100 youth in grades seven through 10 and their parents spend a day on campus engaged in new learning opportunities and topics that may be unfamiliar to them. This year, the College of Science invited thirty of the 100 participants from Richmond City and Henrico County as a way to begin forging connections with school districts and students who are often underrepresented on Virginia Tech’s campus, including potential first-generation college students.

“We wanted to make the program accessible to the many talented students who may not have had the opportunity to visit a college campus and experience science outside of school,” said Shreya Mahajan, who helped organize the event.

STUDENTS WERE ENGAGED IN VARIOUS TOPICS, SUCH AS BRAIN IMAGING, BIOMECHANICS, AND PSYCHOLOGY. MANY OF THEM HAD NEVER BEEN ON A COLLEGE CAMPUS.

Other highlights in STEM education:

- Reinhard Laubenbacher (mathematics, VBI) served as director of Kid’s Tech University http://kidstechniversity.vbi.vt.edu/index.php. Laubenbacher, who also serves as VBI’s deputy director of education and outreach, has a genuine passion for encouraging kids’ interest in science, math, and related subjects, and believes that this exceptional program should be available for children in the United States. He recruited VBI Education and Outreach Senior Research Associate Kristy DiVittorio, and together they have been the driving force behind the effort to make Kids’ Tech University™ a reality for Virginia Tech and its surrounding communities.

- Activities for the Science Outreach Program (SOuP, http://www.socm.vt.edu/) continue to be led by Mike Rosenzweig (biological sciences) in collaboration with Llyn Sharp (geosciences) included: SOuP bridges research and public outreach in the sciences and has a mission to help fund VT research proposals by developing education and broader
impact products primarily for the regional and state-wide K-12 community. For example, the SOuP - Education Resource Center (ERC) has many materials for loan or reference. Kits and specimens available with many linked to Virginia Science Standards of Learning (*SOL*).

- Model Inquiries into Nature in The Schoolyard (MINTS) is an outreach program of the Virginia Tech Museum of Natural History developed to respond to teachers’ requests for information on local natural history in southwestern Virginia and for training in inquiry teaching methods.

- The Museum of Geosciences (http://www.outreach.geos.vt.edu/museum/index.html) provides special programs and exhibits to public school children, community organizations and the general public. The museum sponsored the GeoFair in fall 2010 with over 600 visitors and 127 attendees.

- The Virginia Tech Regional Mathematics Contest, in its thirty-second year, continued to grow, with participation by 575 students from 97 colleges in 26 states.

- The College of Science supports the Blue Ridge Highlands Regional Science Fair.

### International Education and Research

The College of Science is committed to fostering communities that value all cultures, languages, lands, and people. International collaborations will include the establishment of research and education centers and the expansion of study abroad. The International Travel Grant Supplement (ITGS) program helped support 21 faculty in the College of Science to travel and give presentations in Argentina, Belgium, Brazil, Canada, China, India, Japan, Mexico, Portugal, and the United Kingdom.

Richard Turner (MII) and Tim Long (associate dean) are organizing the 44th International Symposium on Macromolecules (MACRO 2012) – IUPAC World Polymer Congress: Enabling Technologies for a Safe, Sustainable, and Healthy World. This symposium will provide an international forum for leading scientists and engineers from academia, industry, and government to discuss multidisciplinary technologies that bridge emerging boundaries of macromolecular science and engineering. This prestigious conference rotates biannually around the globe. The World Polymer Congress is a premier interdisciplinary conference (attendance ranges from 1,000-2,000) for the international polymer science and engineering community. Virginia Tech was invited to host the Congress and it is the tradition for the USA to hold our Congress at a leading polymer science and engineering university.

As globalization becomes an increasingly important aspect of training for our students, departments in the college of science lead programs that provide students with opportunities to study abroad:

- Lori Blanc (biological sciences) led a program to Antarctica: Humans and the Environment, AUIP Program (Hokies Abroad) during the Fall and Winter Break 2010; she
also led a Summer 2010 program to Fiji: Sustaining Humans and the Environment, AUIP Program (Hokies Abroad).

- Khidir Hilu (biological sciences) organized a study abroad program in Switzerland/Italy, Botanizing the Alps.
- Michal Kowalewski (geosciences), in collaboration with Sandor Muldsow of the Universidad Austral, Chile, ran the first international research-training program on “Geobiology of Recent Environmental Changes in Aquatic Ecosystems” which brought students from Chile together with students from Virginia Tech. The Department of Mathematics continued a M.S. exchange program with the Karlsruhe Institute of Technology (German) which regularly brings 2-3 graduate students to VT for one year of study.
- Jerry Via (biological sciences) participated in the Study in Biodiversity at the Caribbean Center for Education and Research in Punta Cana, Dominican Republic.

Community and Student Engagement

The College of Science serves the local community through many outreach efforts. Undergraduate and graduate students have opportunities to engage in service-learning and civic activities. These opportunities amplify student learning and build professional skills to strengthen student academic careers and professional development.

- The Psychological Services Center and Child Study Center, which provides graduate training clinics for doctoral psychology students, and the Autism Clinic provided psychological assessment and treatment services to over 200 local community residents.
- The activities of the Laboratory for Interdisciplinary Statistical Analysis (LISA) in the Department of Statistics continue to grow to improve statistical literacy across campus. The statistical consultants of LISA, mostly graduate students, provide assistance with experimental design, data analysis, interpretation of results and statistical software to University faculty, staff and fellow graduate students on academic research projects. LISA also offered 14 short courses with 525 attendees. In the past year LISA served 334 clients (3761 hours). A walk-in consulting service served 266 clients (366 hours).
- The Massey Herbarium is directed by Khidir Hilu with Tom Wieboldt (biological sciences) as Curator. Work has continued on the Digital Atlas of the Virginia Flora.
Requests for plant identification totaled 578 specimens from Extension personnel and for various research purposes. Four loans comprising 125 plant, fungal, and lichen specimens were made to researchers at other institutions. At present, about 1,111 vascular plant specimens are out on loan to 17 institutions. Fourteen loans comprising 1,313 specimens were borrowed from other institutions for research purposes; six of these loans totaling 411 specimens were returned.

- The Department of Physics and the College of Science sponsored a visit in April, 2011 for Young-Kee Kim, deputy director of the Fermi National Accelerator Laboratory (Fermilab). Dr. Kim explored the frontiers of particle physics and cosmology during a public lecture in Latham Ballroom at The Inn at Virginia Tech. Fermilab is an internationally acclaimed research facility that specializes in high-energy particle physics. In addition to her leadership at Fermilab, Kim is also a professor of physics at the Enrico Fermi Institute at the University of Chicago.

- Dr. Richard Turner (chemistry, Director of MII) organized and led the MII Technical Conference and Review in fall 2010 with plenary lectures given by a) VP Corporate Research 3M Company, b) Leading researcher in ion-containing polymers, and c) Leading researcher in polymeric materials from sustainable monomers.

- The College of Science highlighted its research on “WATER: From Purification and Global Scarcity to Power Generation and Drug Delivery” at the Arlington Showcase in June 2011. Water is often declared as the “next petroleum” with many far-reaching implications at the national and global scales. Technologies are rapidly emerging that demand an understanding of the interactions of water at diverse interfaces including next generation pharmaceuticals, ecosystems, desalination membranes, power generation, and water purification. Nanoscale and computational tools will enable the rapid discovery and fundamental understanding of these water-based technological
solutions, and the interaction of our environment with nanoscale structures is a critical aspect of interdisciplinary research and educational programs within the College of Science at Virginia Tech. COS faculty who gave oral presentations included: James E. McGrath, Chemistry, National Academy of Engineering (NAE): Water purification, desalination, and power generation; Madeline E. Schreiber, Geosciences: Hydrogeology; Michael F. Hochella, Geosciences, University Distinguished Professor: Nanoparticles in the environment; Seong Ki Mun, Physics, VT Arlington Innovation Center for Health Research: Biomedical research in aqueous environments; and Timothy E. Long, Chemistry, Macromolecules and Interfaces Institute (MII): Water-soluble Nanomaterials for Drug and Gene Delivery.

**Outreach Awards**

**Biological Sciences won the 2011 Engaged Department Award.**

Mike Rosenzweig, advanced instructor and biological science outreach coordinator, accepted the award on behalf of his colleagues in the College of Science. Those colleagues include Brenda Winkle, professor and department head; Dana Hawley, assistant professor; Jill Sible, professor and associate dean for curriculum, instruction and advising; Ignacio Moore, associate professor; Ann Stevens, professor; Lisa Belden, assistant professor; Richard Walker, associate professor and associate department head; and Christie Gray, department fiscal manager.

**The Physics Outreach Team won the 2011 College of Science Award for Outreach Excellence.**

The student-run Physics Outreach Team celebrated its 16th anniversary this year. This group of energized undergraduates takes its hands-on physics demonstrations to local and regional schools to excite the students about science and to support the physics teachers. The College of Science, the College of Engineering, and the School of Education frequently invite the team to participate in outreach and recruitment events.

**Alumni Relations**

The Alumni Relations office within the College of Science (COS) constantly seeks to serve and engage our 25,000+ alumni in lifetime mutually beneficial relationships aimed to strengthen the bond between our alumni, the college, and the university. Our college and departmental programs, alumni events, alumni visits, and participation in numerous alumni and student related activities, serve as a backdrop to generate interest and involve our alumni with the COS faculty, administration, students, friends, and other alumni of the college. The Alumni Relations office strives to build long lasting connections by interacting with our current undergraduate and graduate students, playing a significant role with the COS student-based Dean’s Leadership Council. The College of Science Alumni Relations office upholds the mission of the university –
learning, discovery, and engagement through our college alumni involvement, as well as our representation and involvement with the Virginia Tech (VT) Alumni Association.

Alumni Relations Activities, Events, and Involvement:

**July 2010**
- *Summer Around the Drillfield – Department of Geosciences Museum Tour*  
  July 22 – 24, 2010

**August 2010**
- *Department of Statistics Alumni Reception, Vancouver BC*  
  August 1, 2010

**September 2010**
- *Women in the College of Science Alumni Walk, New York City*  
  September 21, 2010

**October 2010**
- *Department of Geosciences Alumni Dinner*  
  October 2, 2010
- *Fall Focus Career Fair and Reception*  
  October 6, 2010
- *Biological Sciences Advisory Board Meeting*  
  October 9, 2010
- *College of Science Homecoming*  
  October 9, 2010
- *Institute for Advanced Study Lecture Series with Paul Waymack*  
  October 15, 2010
- *After the Game - Alumni Dinner, Blacksburg VA*  
  October 16, 2010
- *Celebration of Excellence Luncheon*  
  October 28, 2010
- *College of Science Fall Roundtable Meeting*  
  October 29 – 31, 2010

**November 2010**
- *Department of Geosciences Alumni Reception, Denver CO*  
  November 1, 2010
- *Department of Chemistry Advisory Board Meeting*  
  November 4 – 5, 2010

**December 2010**
- *Alumni Holiday Dinner, Richmond VA*  
  December 16, 2010
- **College of Science Commencement Breakfast**  
  December 17, 2010

**February 2011**
- **Grad Fair**  
  February 23, 2011

**March 2011**
- **Directions Career Fair**  
  March 11, 2011
- **Department of Physics Alumni Reception, Dallas TX**  
  March 22, 2011

**April 2011**
- **College of Science Roundtable Scholarship Interviews and Dinner**  
  April 8, 2011
- **Department of Physics Lecture Series with Professor Young-Kee Kim, Deputy Director of Fermilab**  
  April 12, 2011
- **Biological Sciences Board Meeting**  
  April 16, 2011
- **Department of Physics Award Ceremony**  
  April 8, 2011

**May 2011**
- **College of Science Commencement Reception**  
  May 13, 2011
- **College of Science Departmental Commencement Ceremonies**  
  May 14, 2011
- **Old Guard College of Science Breakfast**  
  May 25, 2011

**June 2011**
- **College of Science Roundtable Advisory Board Meeting, Arlington VA**  
  June 3 – 4, 2011
- **College of Science ‘Meet the Scientists’ Event, Arlington VA**  
  June 17, 2011

**July 2011**
- **New Student Orientation**  
  July 14, 2011

**August 2011**
- **Alumni Association’s Drillfield Series - Steppin’ Out – COS component**  
  August 5 – 7, 2011
Alumni Relations Activities, Events, and Involvement in planning for 2011 - 2012

- College of Science Pre-Game Hospitality Tents – Fall 2011
- Biomedical Technology Graduate Program Networking Event, Arlington VA – Fall 2011
- College of Science Northern Virginia Regional Event - September 2011
- Young Alumni Network Focus Group, Arlington VA - September 23 – 24, 2011
- Fall Focus Career Fair and Reception – September 28, 2011
- College of Science Homecoming – October 1, 2011
- College of Science Biological Sciences Board Meeting – October 1, 2011
- College of Science Fall Roundtable Meeting – October 14 -15, 2011
- College of Science Celebration of Excellence Luncheon – October 14, 2011
- Department of Geosciences Alumni Dinner – October 15, 2011
- College of Science New York City Regional Event - October 2011
- College of Science Open House – November 12, 2011
- College of Science California Regional Event – December 2011
- College of Science Commencement Breakfast – December 16, 2011
- College of Science Houston Regional Event – February 2012
- College of Science Richmond Regional Event – March 2012
- Directions Career Fair – spring 2012
- “Fun with Physics” – spring 2012
- Grad Fair - spring 2012
- Department of Biological Sciences Board Meeting – spring 2012
- College of Science Scholarship Interviews and Dinner – April 2012
- Department of Physics Awards Ceremony – April 2012
- College of Science Boston Regional Event – April 2012
- College of Science Commencement Reception – May 11, 2012
- College of Science Commencement Departmental Ceremonies – May 12, 2012
- Old Guard College of Science Breakfast – May 2012
- College of Science Spring Roundtable Meeting – June 2012

The Alumni Relations office in conjunction with the COS Development office reached two of its key goals set forth last year. A Young Alumni Focus Group has been set to take place in fall 2011. This focus group will provide recommendations to help our office set forth the guidelines and procedures in establishing a COS Young Alumni Network.

In addition, during the fall of 2010, the Alumni Relations and Development offices instituted the inaugural Celebration of Excellence luncheon. This event recognized scholarship winners along with the donors who made the awards possible. The lunch provided an opportunity for the donors to meet the students who had benefited from their gift and for the students it was a time to acknowledge the donor’s generous support. More than 100 alumni, friends, faculty and students gathered for this event. Due to its success, the luncheon is slated to be an annual event in the fall of each year.
The Alumni Relations office will continue its mission to increase the visibility of the college by working with our Development office to involve and engage our alumni and by working with the COS Communications Director to determine best methods to communicate effectively with our COS alumni.

Each year the VT Alumni Association honors recent alumni from each academic college who have graduated in the past ten years. The College of Science selected Brian D. Sutton (mathematics ’01) as our 2010–2011 College of Science Outstanding Recent Alumnus and Dr. Feihe Huang (chemistry ’05) as our 2010 – 2011 College of Science Outstanding Recent Graduate Alumnus.

2011 – 2012 proves to be an exciting year for the Alumni Relations office as we continue to work closely with the COS Development office to foster the momentum of the university’s $1 billion fundraising campaign, after its completion, by hosting a series of regional events for our alumni. The office will also strive to find additional ways to effectively connect with our current undergraduate and graduate students during their tenure on campus.

Development

The College of Science Development Office remains committed to its mission of engaging alumni and friends of the college and its departments through personal and professional involvement, both on and off campus, and through private and corporate giving. It is with sincere gratitude that we acknowledge all who supported the college this fiscal year. Our continued success would not be possible without the generous philanthropy of our alumni and friends who share our vision and remain steadfastly dedicated to moving the college forward.

In October 2007, Virginia Tech announced the national, public phase of its $1 billion fundraising campaign; the campaign officially ended on June 30, 2011. The campaign goal for the College of Science was $62 million. The college concluded the current fiscal year and the campaign with an overall fundraising total of $64.6 million and achieved 104.3 percent of its campaign goal.

During fiscal year 2011, the college secured over $8 million in outright and deferred gifts. More than $3 million in private gift income was recorded this fiscal year, representing an increase of 30 percent from the previous year. Notable leadership gifts were made to support undergraduate scholarships in the College of Science, the College of Science Roundtable Endowed Dean’s Chair, and the Department of Geosciences.

The college planned and implemented several special events to recognize our current donors and engage new prospects. The first Celebration of Excellence Luncheon was held in October 2011 to honor the college’s supporters, as well as those who benefit from their generosity. The luncheon was extremely successful and will become the signature annual event for the college. Additionally, the college continues to successfully engage members of its Roundtable Advisory Board. Two Roundtable meetings were held this fiscal year; the first meeting was held in
Blacksburg in October 2010, and the second was held in Northern Virginia in June 2011. The college also participated in several university-wide events, including regional campaign kick-offs in Washington DC, Baltimore, and New York City.

The Development Office concluded the fiscal year with two vacant positions. Searches are currently underway to fill the associate director of development position and the development associate position.

Corporate and Foundation Relations

“Charitable giving by America’s biggest companies will probably be flat in 2011, after a sharp rebound in 2010, according to a Chronicle [of Philanthropy] survey of 180 of businesses.” Foundations and other grant makers reported the largest percentage of this went to “keeping the lights on” at local charities. The report also notes major corporate foundations like IBM and Bank of America are moving toward community volunteering. In general, the economy continues to be worrisome resulting in basic need investments.

Despite economic uncertainty, corporate and foundation interactions remained in good condition with the College of Science. The number of job postings through the university Hokies4Hire increased by 133% from FY10 to FY11 yet our career fairs were attended by 10% fewer employers. Corporate and private foundation research projects for FY2011 dropped by 3.5% yet our philanthropic gifts rose by 33%. In all, the College of Science corporate and foundation ties remain strong even during a tumultuous economy. The support of our alumni and friends were key contributors in a positive year the College of Science. We thank our alumni and friends as they continue to champion corporate and foundation philanthropy, research, recruiting and corporate matching programs.

Highlights of corporate and foundation philanthropic activities

- Gifts in-kind such as high tech analytical instruments and modeling software greatly assist in the college’s discovery and learning missions. 3M donated nanofiber weaving equipment supporting polymer science. Agilent Technologies pledged instruments for chemistry education as well as their continued support for the VTX Crystallography Laboratory. BD Diagnostics donated RT-PCR instruments for life science research. PPD continued supporting our mass spectrometry facilities for hands-on exposure to undergraduate students. Geosciences received Schlumberger’s Petrel subsurface modeling software to support oil and gas exploration.

- Fellowships, scholarships, field trips and research support provided much needed financial support to attract talented students and provide hands-on experiences. These funds provide value to the students and community in many ways. We would like to provide a special thank you to the American Chemical Society, BP Corporation North America, CapitalOne, ConocoPhillips, Eastman Chemical Company, KRATON Polymers, Minera Mexicana El Rosarios, Minera Plata Adelante, Minitab, Procter & Gamble,
Petroleum GeoServices, Pfizer, SAS, Science Applications International Corporation, Solvay Advanced Polymers, and Toray Industries for their support.

- Forums to exchange ideas remain essential to developing joint projects, maintaining relevant curriculum, and debating critical topics. Chevron-Phillips Seminars sponsored three nationally recognized speakers in polymer chemistry. The Department of Geosciences held the 16th annual Geosciences Student Research Symposium (GSRS) made possible by contributions from BP, ConocoPhillips, Schnabel, and select local sponsors. The Department of Statistics 2010 Corporate Partner program was attended by 3M, BD Diagnostics, CapitalOne, Eli Lilly, GE Research, Merck, and SAS. MII and the Department of Chemistry hosted the 2010 Technical Conference & Review with keynote by 3M’s vice president of innovation.

- Matching Gifts empowered many alumni and friends to invest in causes close to them. The College, Chemistry, Geosciences, and Statistics received the most matching gifts. The top matching gift companies included Aerojet, Chevron Global Fund, ExxonMobil, Microsoft, and Merck.

Communications: Science in the News

Highlighted below are some of the most noteworthy communications achievements for the 2010-2011 academic year.

Program area: Publications

Two issues of the College of Science Magazine were produced in FY11. The fall 2010 issue featured international activities within the college and the spring 2011 issue featured the college’s STEM initiatives. Both issues received positive feedback, particularly among alumni and donors on visits by the college’s director of development, director of alumni relations, and director of corporate and foundation relations. In addition, visits to the magazine’s online version (http://www.science.vt.edu/news/magazine/index.html) continue to grow as promotional efforts increase. The magazine received 4,975 UPVs during the year. That met the goal of 5,000 UPVs stated in last year’s communications plan and more than doubled the number of UPVs from the year before.

With the assistance of our technology coordinator, we continue to build out the content online with featured items and links in the right-hand column of each online issue. Our intention is to reduce the frequency of the print version as we increase readership online.
Program area: Web Communications

Total UPVs to the college’s web site were 114,547. It is anticipated that UPVs will continue to rise as web site promotions increase.

According to Virginia Tech homepage metrics, two stories from the College of Science were among the top three faculty-research focused articles for the year in terms of UPVs:

1. (Breakthrough Awards/laser cancer therapy) (3,521 UPVs)

Karen J. Brewer, Professor Brenda Winkel (Biological Sciences) and Roger Dumoulin-White (Theralase Corporation) were named “Breakthrough Innovators” by Popular Mechanics for their work on light-activated compounds for the treatment of cancer. The magazine noted that "Two Virginia Tech scientists may have invented the
future of cancer treatment - a way to eradicate tumors without the harmful side effects of chemotherapy, radiation or a surgeon's scalpel."

2. (Statistical biases in NCAA tournament selection) (3,133 UPVs)
   http://www.vtnews.vt.edu/articles/2011/03/030111-science-ncaa.html

Assistant professors Leanna House and Scotland Leman (statistics) examined historical data, and quantified biases that play a role in granting Division I at-large basketball teams inclusion in the NCAA March Madness Tournament.

Adding on to a previous video created by an outside consultant, we developed a new College of Science video centered around the theme of water.
http://www.science.vt.edu/media/VT-science-water-video.html

Five Spotlights were produced for the college this year. Two of them received more than 3,000 UPVs (Autism Clinic 3,252 and Black Holes 3,124). All three of the ones that have run so far this year were in the top 50 Spotlights for the year in terms of UPVs.

Program area: Media Relations

Two stories caught national media attention this year: the Popular Mechanics Breakthrough Award and the story about statistical biases in the NCAA Tournament selection. Relentless pitching resulted in the following placements. Note that these campaigns received stories in at least five major media outlets.

**Media Placement for Breakthrough Award:**
- Discovery News
- Technology Transfer Tactics
- LiveScience.com
- Popular Mechanics
- CNN Headline News
- Fox affiliates
- Physorg.com
- HealthCanal.com
- BioSpace.com
- Gadgeteer.com
- HealthNews.com
- ScienceBlog.com

**Media Placements for March Madness Story:**
- The Washington Post
- MSN Fox Sports
- Richmond Times Dispatch
- Sports are 80 Percent Mental (blog)
- Fromtheeditr (blog)
- Science Daily
- Science Blog
- Science Newsline Medicine
- Red Orbit
Diversity

The College of Science Diversity Committee was co-chaired by Anne McNabb (biological sciences) and Madeline Schreiber (geosciences); members were Joe Merola and Judy Riffle (chemistry); Sheryl Ball (economics); James Turner (mathematics), Victoria Soghomonian and Chris Thomas (physics); Julie Dunsmore and Russell Jones (psychology); Marlow Lemons and Golde Holtzman (statistics); and Jill Sible (COS and ex officio member). This membership reflected the chair’s goal of getting more involvement across departments by having dual representation when possible.

The focus of COS Diversity Committee efforts in FY11 included:

**Increasing graduate diversity and success:**
- establishing relationships with HBCUs for recruiting diverse graduate candidates
- welcoming activities for prospective grad applicants visiting campus
- working within departments to increase diversity in grad admissions and provide programs that support retention and the overall success of graduate students

**Creating a climate for diversity:**
- Strategies for Effective Interactions sessions to proactively address the need for effective academic interactions and ability to deal with “conflict” situations. This also plays a role in grad retention and grad training for future professionalism

**“White paper” on COS educational diversity initiatives:**
- This draft document describes the key initiatives that the COS Diversity Committee considers most useful and productive to promote undergrad and graduate diversity in the college. It will be used in the COS Diversity Strategic Plan and will define some priorities for funding of specific programs through grants.

**Create avenues for grant Funding:**
- The COS Diversity Committee is trying to build a model of research theme funding (first topic: energy) that will support some specific energy research topics involving faculty in COS and at several HBCUs. Funding will be sought from both DOE and private industry for both the research theme and selected educational initiatives at VT and the HBCU partners.

A link to the complete report of activities within the Inclusive Excellence Model Framework for the last academic year can be found at [http://www.diversity.vt.edu/inclusive-excellence-model/inclusive-excellence-index.html](http://www.diversity.vt.edu/inclusive-excellence-model/inclusive-excellence-index.html). Four Domains have been identified:

1. Access and Success: Achieve a more diverse and inclusive undergraduate and graduate student body, faculty and staff.
2. Campus Climate and Intergroup Relations: Create and sustain an organizational environment that acknowledges and celebrates diversity and employs inclusive practices throughout daily operations.

3. Education and Scholarship: Engage students, faculty, and staff in learning varied perspectives of domestic and global diversity, inclusion, and social justice.

4. Institutional Infrastructure: Create and sustain an institutional infrastructure that effectively supports progress in achieving goals in the diversity strategic plan.

Below we highlight a few of the activities in these four domains:

- To aid in the quality of advising and faculty-grad interactions, the Biology Diversity Committee, in collaboration with the COS Diversity Committee has offered proactive sessions on “Strategies for Effective Interactions” (see more developed description in the section on Campus Climate).
- The COS Cluster Hiring Committee has worked through its cluster hiring and dual-career hiring to attempt to improve faculty diversity. The percentage of female faculty in COS has increased from 15.7% in 2005 to 19.4% in 2010. Overall race/ethnic diversity (i.e., all non-white faculty) has increased from 18.9% to 22.2% in the same time period (data from Institutional Research).
- COS Diversity Committee participates in the awarding of MAOP scholarships, works with MAOP to improve advising of URM students in departments.
- Two McNair and one MAOP student had research experiences in psychology. Three undergraduate IMSD students (2010-11) had research experiences (with Dunsmore and Panneton).
- Geosciences successfully recruited two black African graduate students to the department.
- Dana Hawley (biological sciences) presented a workshop on Careers in Biology to high school students from underrepresented groups through the VT Upward Bound summer program.
- Mathematics hosted its 15th annual Women in Mathematics Career Day at Virginia Tech. 258 students from 22 schools attended.
- Andy Norton (mathematics) is the Principal Investigator on a NSF Robert Noyce Scholarship Grant, Virginia Teach: Serving Mathematics Students in Need. The grant provides scholarships for students who commit to teach in high-need schools.
- Physics provides summer research opportunities that attract women and minorities from other universities and high schools (three female and four minority participants in 2009-10; three African American, one Hispanic).
- In physics, the “Ladies of Robeson,” a networking group consisting of all women in the Department of Physics (faculty, students, and staff) is a source of support and information, regarding course work, research opportunities, and preparation for graduate school in a discipline in which women are underrepresented.
- The psychology department supported a chapter of the Association of Black Psychologists and contributed financial support to the Black Graduate Student Organization for its annual Ebony Affair celebrating diversity in our community.
• The Psychology Committee on Diversity is involved in the recruiting and retention of minority graduate students. Departmental efforts to create a successful climate for graduate diversity and retention have led to increased graduate URM diversity from 7% of doctoral students in 2005 to an average of 16% over the last three years (2008, 2009 and 2010; data from Institutional Research).
• Judy Riffle (chemistry) recruited, arranged laboratory experiences for, and mentored three undergraduates from St. Paul’s College in the summer REU program in MACRO.
• Mike Rosenzweig (biological sciences) worked as advisor and summer contact with program leaders of VT-STARS (outreach/pipeline project for Southside VA) to assist in the integration of students into campus academic units.
• Nancy Ross (associate dean) serves as the AdvanceVT college liaison.
• Mikhelle Taylor (COS admin) is assisting in the establishment of two chapters of national minority organizations at VT: Society for Advancement of Chicanos and Native American Scientists (SACNAS) and American Indian Science & Engineering Society (AISES).

Diversity Award

The College of Science Diversity Award was presented in Spring 2011 to two individuals in recognition of their efforts in fostering a diverse and successful student community in the college and the university. Diane Walker-Green and Diego Troya go far beyond their job requirements in their efforts to create a welcoming, helpful environment for students in the Departments of Physics and Chemistry, respectively. They are both extremely dedicated to students, and in particular, to the recruitment of a diverse student population.
<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
<th>Academic Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ross Angel</td>
<td>GEOSCIENCES</td>
<td>Mercator Professorship, Germany</td>
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<tr>
<td>Martha Ann Bell</td>
<td>PSYCHOLOGY</td>
<td>Outstanding Scholar Alumni Award from University of Maryland</td>
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<tr>
<td>Dept of Biological Sciences</td>
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<tr>
<td>Thomas Burbey</td>
<td>GEOSCIENCES</td>
<td>Fulbright Scholar to France, August 2010 to January 2011</td>
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<tr>
<td>Martin Chapman</td>
<td>GEOSCIENCES</td>
<td>Vice-President of the Eastern Section of the Seismological Society of America (President–elect for 2011-12)</td>
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<tr>
<td>Harry Dorn</td>
<td>CHEMISTRY</td>
<td>Dr. A. C. Lilly, Jr., Faculty Fellow of Nanoscience</td>
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<tr>
<td>Patricia Dove</td>
<td>GEOSCIENCES</td>
<td>* C. P. “Sally” Miles Professor of Science</td>
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<td></td>
<td></td>
<td>* Fellow of Geochemical Society and European Association of Geochemistry</td>
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<tr>
<td>Jack Evans</td>
<td>BIOLOGICAL SCIENCES</td>
<td>2011 Alumni Award for Excellence in Undergraduate Academic Advising</td>
</tr>
<tr>
<td>Carla Finkielstein</td>
<td>BIOLOGICAL SCIENCES</td>
<td>American Association for Cancer Research Minority Scholar Award in Cancer Research, National Breast Cancer Scholarship</td>
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<tr>
<td>Scott Geller</td>
<td>PSYCHOLOGY</td>
<td>* Outstanding Applied Research Award from Division 25 of the American Psychological Association</td>
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<td>* Fellow of the Association for Behavior Analysis International</td>
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<td>* Named among the 50 most influential Environment Health and Safety Leaders by EHS Today</td>
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<tr>
<td>Dana Hawley</td>
<td>BIOLOGICAL SCIENCES</td>
<td>NSF CAREER Award</td>
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<tr>
<td>Michael Hochella</td>
<td>GEOSCIENCES</td>
<td>President-elect of the Mineralogical Society of America (2011-2012)</td>
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<tr>
<td>Morgan Hubble</td>
<td>PSYCHOLOGY</td>
<td>Lab Manager of the CAP Lab 2010 Virginia Tech</td>
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<td>Outstanding Performance in Labs Award</td>
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<tr>
<td>Michal Kowalewski</td>
<td>GEOSCIENCES</td>
<td>Fellow of the Geological Society of America</td>
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<tr>
<td>David G. I. Kingston</td>
<td>CHEMISTRY</td>
<td>Appointed by U.S. Secretary of Health and Human Services as a member of the National Advisory Council for the National Center for Complementary and Alternative Medicine (NCCAM) for the period 2010-2014</td>
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<tr>
<td>Name</td>
<td>Field</td>
<td>Awards/Recognitions</td>
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<tr>
<td>Timothy Long</td>
<td>Chemistry</td>
<td>2011 Mark Scholar Award American Chemical Society</td>
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<td>2011 ACS PMSE Cooperative Research Award in Applied Polymer Science</td>
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<td>Pressure Sensitive Tape Council (PSTC) 2011 Carl Dahlquist Award</td>
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<tr>
<td>Ignacio Moore &amp;</td>
<td>Biological Sciences</td>
<td>COS Certificate of Teaching Excellence</td>
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<tr>
<td>Richard Walker</td>
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<tr>
<td>Robert B. Moore</td>
<td>Chemistry</td>
<td>Interim Associate Director of Research for ICTAS</td>
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<td>Chair-Elect of Polymer Chemistry Division of American Chemical Society, 2010</td>
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<tr>
<td>Physics Outreach</td>
<td>Physics</td>
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<td>Team (mentored by</td>
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<td>Josh Peebles &amp;</td>
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<td>Byron Wiedeman)</td>
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<tr>
<td>Judy Rifflle</td>
<td>Chemistry</td>
<td>2011 Alumni Award for Research Excellence</td>
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<td>Fellow of American Chemical Society Polymer Division</td>
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<td>Webster Santos</td>
<td>Chemistry</td>
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<tr>
<td>Blackwood Junior</td>
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<tr>
<td>Faculty Fellow of</td>
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<tr>
<td>Life Sciences</td>
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<tr>
<td>Leo Pihonen</td>
<td>Physics</td>
<td>William E. Wine Award for Outstanding Teaching</td>
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<td>William E. Hassinger, Jr., Senior Faculty Fellow in Physics</td>
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<tr>
<td>James Spotila</td>
<td>Geosciences</td>
<td>Exceptional Reviewer for 2010 from Geological Society of America Science Editors</td>
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<tr>
<td>Diego Troya,</td>
<td>Chemistry</td>
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<tr>
<td>Diane Walker-Green,</td>
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<td>Physics</td>
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<td>Richard Walker</td>
<td>Biological Sciences</td>
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<td>Brenda Winkel &amp;</td>
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<tr>
<td>Karen Brewer</td>
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<td>John Tyson</td>
<td>Biological Sciences</td>
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<td>G. Geoffrey Vining</td>
<td>Statistics</td>
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<td>Shuhai Xiao</td>
<td>Geosciences</td>
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<td>John Tyson</td>
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<td>2011 COS Outreach</td>
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<td>2011 COS Diversity</td>
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<td>2011 COS Outreach</td>
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<td>Leo Pihonen</td>
<td>Physics</td>
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<td>Judy Rifflle</td>
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<tr>
<td>Webster Santos</td>
<td>Chemistry</td>
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<tr>
<td>Beate Schmittmann</td>
<td>Physics</td>
<td>Named Outstanding Referee by the American Physical Society</td>
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<td>John Tyson</td>
<td>Biological Sciences</td>
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<td>James Spotila</td>
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<td>Karen Brewer</td>
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<td>Popular Mechanics</td>
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<td>Shuhai Xiao</td>
<td>Geosciences</td>
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<td>Popular Mechanics</td>
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<td>Measure</td>
<td>Metric Definition and Information Sources</td>
<td>University Target Performance</td>
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<tr>
<td>Number of graduating undergraduate students who participated in research experiences</td>
<td>75% of graduating undergraduates</td>
<td>75% in 2010-11</td>
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<tr>
<td>Minority student retention</td>
<td>70% for Bachelor's degree by 2012</td>
<td>Minority Student Graduates</td>
</tr>
<tr>
<td>Total expenditures in grants and contracts per research faculty</td>
<td>$250,000</td>
<td>$250,000</td>
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<tr>
<td>Average number of sponsored awards per faculty</td>
<td>2 Awards</td>
<td>2 Awards</td>
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<tr>
<td>Number of yearly doctoral appointments reported to National Science Foundation</td>
<td>100</td>
<td>100</td>
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<tr>
<td>Average number of new disclosures and inventions</td>
<td>50 disclosures</td>
<td>50 disclosures</td>
</tr>
<tr>
<td>Number of graduate research students who participate in research and mentorship programs</td>
<td>50% of graduate students</td>
<td>50% of graduate students</td>
</tr>
<tr>
<td>Intensity of collaboration with external partners</td>
<td>20%</td>
<td>20%</td>
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<tr>
<td>Foundation</td>
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