A BRIGHTER FUTURE FOR THE COMMONWEALTH AND BEYOND

UMASS AMHERST RESEARCH IS WHAT’S NEXT

REPORT ON RESEARCH

UMassAmherst
The data in this report reflects activities from July 1, 2013, through June 30, 2014.
To advance this mission, the campus was selected to house the statewide Energy Extension Initiative, designed to mobilize information on the latest clean-energy technologies as well as the resources to put them into practice. A $6-million grant from the Massachusetts Department of Energy Resources will support community-scale test-bed projects designed to identify and mitigate financial, social, political, and technical barriers to wider deployment of energy-efficient practices in the commonwealth.

David Damery, environmental conservationist and extension professor, is leading the initiative, big-data expert Prashant Shenoy and mechanical and industrial engineer Dragoljub Beka Kosanovic are co-principal investigators. About $2 million of the grant will expand services at the U.S. Department of Energy’s Northeast Clean Energy Application Center through the campus’s existing Center for Energy Efficiency and Renewable Energy (CEERE), while $4 million will help campus investigators develop an energy outreach and extension-type program drawing on UMass Amherst experts. Damery and the team are issuing a request for proposals, inviting high-level researchers working on clean-energy technologies to join in the mix.

“The opportunities are vast,” Damery says. “We specifically structured this initiative to call for these broad research proposals in order to invite the best ideas.”

The $2 million for CEERE services will be targeted at combined heat and power initiatives to help provide technical assistance to cities, towns, and businesses looking to adopt combined heat and power solutions. Citing the campus’s power plant as an example, Damery points out that it primarily burns natural gas to produce electricity but also uses its excess steam to heat and cool campus buildings. “By producing both electricity and capturing the extra heat produced burning natural gas, we are able to achieve very high efficiency levels,” he explains. “If you just generated electricity, you’d get a third of the power out of that fuel source, no matter what the fuel source. The remaining two-thirds would be wasted.”

The other $4 million of the grant will more broadly support additional adoption of energy-efficient technologies across the commonwealth. Damery says the Initiative intends to allocate funds for a variety of projects, including some devoted to wind and solar power. Because a significant portion of its funding comes from the commonwealth’s alternative compliance fund—penalties paid by utilities who failed to meet the renewable portfolio standard—the Initiative also supports projects that may help eliminate hurdles to clean-energy implementation. To ensure that the Initiative yields real change, Damery and the team are asking proposers to specifically state how many megawatts of renewable energy they expect their projects to generate.

Damery’s team is in constant contact with the Massachusetts utilities who are natural partners in the pursuit to solve energy issues. Employing big-data analysis and utilizing the Massachusetts Green High-Performance Computing Center (MGHPCC) in nearby Holyoke, Shenoy has long worked with local utilities to develop algorithms to provide power more efficiently. He will expand this work to look more specifically at data centers, using the MGHPCC as a test-bed. These centers, Damery explains, are notorious energy hogs: mid-sized ones use about as much energy as a small city. With an increasing reliance on IT, this issue is a critical one, especially in areas like Massachusetts having strong information economies but high energy costs. The MGHPCC offers several thousand points of instrumentation to collect operational data on everything from HVAC (heating, ventilation, and air conditioning) to fine-grain server power consumption and energy usage, yet such data currently goes uncollected. Shenoy and his colleagues propose to design an automated system to collect and centrally store all of it on one or more servers to support the
Another initial test-bed project takes a closer look at something that hits closer to home for most of us: perceived comfort in the indoor environment. Led by environmental conservationist Simi Hoque, campus researchers will travel throughout the commonwealth using low-income housing to conduct studies under controlled lighting, temperature, humidity, and air-quality conditions. Damery explains that building managers too often adhere to a specific set of energy standards in every climate and season, yet such factors play a huge role in perceived comfort—a role the team will be exploring further. Dry heat during a New England winter, for example, leaves one feeling dry and chapped, while too much humidity during the summer leaves one feeling sweaty and uncomfortable. Also, some people may be more tolerant of a cooler indoor temperature during the winter and a warmer one during the summer than current standards provide.

Beyond supporting innovative research projects, a big priority for the Energy Extension Initiative is providing expertise and support to cities and towns investigating clean-energy technologies. Damery explains that many municipalities may not have sufficient funds for preliminary engineering analysis or the expertise required to deploy new equipment, which is where the initiative will have the greatest reach. Beyond supporting innovative research projects, a big priority for the Energy Extension Initiative is providing expertise and support to cities and towns investigating clean-energy technologies. Damery explains that many municipalities may not have sufficient funds for preliminary engineering analysis or the expertise required to deploy new equipment, which is where the initiative will have the greatest reach.

In addition to focusing on cities, towns, and businesses, Damery hopes to provide support for projects that help homeowners be more energy-efficient. Along with the Fraunhofer Center for Sustainable Energy Systems (with which UMass Amherst is jointly hiring Initiative staff), Damery is looking into a project integrating photovoltaic technology into standard roofing shingles.

Damery says that with ever more municipalities, businesses, and homeowners considering energy expenditures, the initiative is gaining enough support to have a real impact. “The human species did not think seriously about energy use in buildings until 1974, 1975,” Damery says. “We’ve been thinking about it more and more but we might be at a real tipping point in 2014, when these issues seem to be on almost everyone’s minds.”

Imagine a time when women at high risk for breast cancer will be quickly identified and treated preventatively. Consider the impact on disease sufferers if clinicians were given a way to stop the cancer’s spread to vital organs. Epidemiologist Susan Hankinson, veterinary and animal scientist Joseph Jerry, and chemical engineer Shelly Peyton are helping practitioners realize these transformative goals.

Known for her 20-plus-year stint as a senior investigator on two long-term, ongoing cohort women’s health studies, Nurses’ Health Study (NHS) I and II, Hankinson is no stranger to women’s health issues. She is currently investigating the associations between hormones and breast cancer and has already helped establish that sex steroids and prolactin are breast cancer indicators in postmenopausal women. Now she is fine-tuning that research to more accurately evaluate their contribution to individual risk prediction.
“We’re evaluating how much new information these hormone levels can add to what we already know about breast cancer risk factors,” says Hankinson, “in order to see if we can use that clinically to help women decide if they’re at high enough risk to be screened more frequently or potentially to use chemoprevention.”

Hankinson was also granted $1.8 million from the National Institutes of Health to research the role played by androgens—hormones that can be converted to estrogen in the breast—in the development of the disease. If androgens are found to be important, existing or new anti-androgen therapies might provide an alternative prevention strategy for breast cancer, says Hankinson.

One of the unsolved mysteries of breast cancer, and another of Hankinson’s research interests, is why the relationship between body size and breast cancer changes throughout life. overweight children and adolescents are at lower breast cancer risk as adults, while overweight postmenopausal women are at higher risk. With Jerry and colleagues at Baystate Medical Center, Hankinson works to identify underlying pathways responsible for the association.

“We know that obesity has a complicated and large impact on breast cancer risk and outcomes,” Jerry says. “A breast cancer patient registry that Jerry and his colleagues at the Pioneer Valley Life Sciences Institute (PVLSI) and Baystate Medical Center have generated contributes high-value patient information to many who are researching the disease, including Hankinson and Peyton. Jerry explains that the breast cancer awareness community has had a big impact on the registry and that women who go to Baystate Medical Center for treatment and preventive care have enthusiastically rallied to participate. The registry provides a foundation from which factors embedded in the patients’ medical history that influence breast cancer can be more easily deciphered—information important to Hankinson as she maps the relationship between childhood obesity and the disease. Jerry, who studies the disease in animals, says the Institute provides a unique opportunity to draw parallels between what they learn in the laboratory with model systems and what happens in humans.

**From preventive strategies to subtype identification and metastasis, UMass Amherst researchers have breast cancer research covered and are pioneering ways to address prevention and treatment of the disease.**

Jerry, who is PVLSI’s science director, and oncologist Grace Makari Judson were recently granted $1.5 million from Springfield’s Rays of Hope Foundation to further the Institute’s breast cancer research. By connecting academic researchers with clinicians, the Institute is developing more personalized ways to treat the disease. The breast cancer registry has grown rapidly and is an integral part of Jerry’s personal research. He explains that the registry allows him to look across the thousands of each patient’s genes to develop her specific “signature.” Jerry is using gene-expression profiling to investigate the ways the disease can manifest and is using the registry to identify high-risk subtypes of atypical hyperplasia, or pre-malignant breast lesions. He is looking for gene expression signatures that will enable clinicians to more quickly identify and proactively treat the 20 percent of women diagnosed with atypical hyperplasia who are likely to develop full-blown breast cancer.

Once preventive measures have failed, clinicians could benefit from knowing how the cancer will spread according to the various disease subtypes—an area Peyton is working on. Within the past few years the young researcher has received several large grants from the National Institutes of Health, the National Science Foundation, and the Pew Charitable Trusts to further her research, which employs stem cells to mimic the various tissues to which breast cancer can spread or metastasize.

Trained in biomaterials, Peyton shuns the common glass plate used by most researchers and instead uses stem cells to recreate the microenvironments cancer cells normally inhabit. She explains that because the common model is inadequately human, many clinical trials have failed.

“We have these rich, complex microenvironments that cells live in.” Peyton says. “And so if we really want to understand what’s happening during the biology of disease, we have to put cells in their appropriate context.”

Peyton explains that there may be as many as 20 different subtypes of the disease, all of which metastasize differently; some spread only to bone, others travel quickly to the brain and lung. It is of great value to clinicians to understand that relationship, in order to identify areas to screen more frequently, as screening is costly and resource-intensive. Using information from Jerry and the PVLSI registry, Peyton is mapping the different paths of metastasis according to identified subtypes. This work is already yielding some predictive powers, which Peyton is working with graduate student Laura Barney to publish.

In addition to predicting risk of metastasis, Peyton aims to use her knowledge of that process to engineer a new type of drug to treat the disease. While most drugs used to treat breast cancer target the cancer cells themselves, Peyton is paying close attention to healthy cells within the various tissues and what they do to help the tumor grow. One type of cell, mesenchymal stem cells, is present in all human tissue in order to help regeneration in case of injury. Confused by the presence of cancer cells, these cells deem the cancerous tissue a wound and rally to help heal the area, but instead catalyze the growth of the tumor. Peyton believes that a drug that changes the behavior of mesenchymal stem cells could stop cancer growth.

Though clinical trials are a good way off, Peyton hopes her more immediate results will inspire others to use more realistic models to study breast cancer.

“What we really want to do is open up that field to the possibilities of studying cancer biology in these easy-to-use, realistic microenvironments,” Peyton says.

Hankinson, Jerry, and Peyton are united around a common goal: to mitigate and ultimately cure breast cancer. Because they each have a piece of the puzzle, they have found it greatly beneficial to collaborate toward that end.

“A tremendous amount has changed with breast cancer research,” says Jerry. “Though there’s more work to do, those of us in the field have made extraordinary leaps.”

Grace Makari Judson, Baystate Health Systems, and Professor Joe Jerry are partnering with Springfield’s Rays of Hope Foundation to develop a more personalized approach to breast cancer treatment.
As the consequences of climate change—from increasingly frequent storms to rising sea levels and the rash of severe weather that has become the new norm—continue to grow and impact populations around the globe, UMass Amherst regional planner Elisabeth Hamin is working with communities in the region and beyond to incorporate resiliency frameworks into their budgets and prepare for extreme weather events.

Hamin, who leads the Department of Landscape Architecture and Regional Planning, has gone town to town with doctoral student Ana Mesquita to interview regional planners along the East Coast. Their field research has made it clear to Hamin that many communities are ill-prepared for increasingly damaging weather, not for lack of political will but rather due to planners not having enough information and resources.

“The planners,” says Hamin, “can’t be the ones to figure out what the risks are; that’s beyond the scope of what a non-expert can do. One of the things they need in order to move forward is some sort of officially sanctioned projections.”

In their efforts to encourage resilience in the face of climate change, Hamin and her colleagues work with communities to identify new priorities. As part of the Regional Planning Studio (which Hamin taught for several years), the class partners with a different municipality each year helping them fine-tune their master plan. They begin by collecting information about the town’s geography, population, societal trends, geology, and cultural divides. They then layer these data, along with climate trends and municipal zoning, into one aggregated map to identify emerging trends and future scenarios if these trends continue. Students also meet with key decision-makers and hold public workshops to discuss community concerns. Environmental justice, Hamin explains, inevitably comes into play during these meetings. Major coastal cities like New York and Boston are often better able to harness the necessary resources to protect susceptible areas, while communities with fewer resources remain vulnerable. Recently, Hamin and her students worked with the coastal town of Marshfield, Mass., on a climate adaptation plan. It was so well received that the town became one of the first in the region to incorporate it into their master plan and acknowledge the need for surge protection and hurricane preparations.

The National Science Foundation’s Research Collaboration Network on Science, Engineering, and Education for Sustainability recently awarded Professor Hamin and her colleagues a $537,000, five-year grant in support of their project “Sustainable Adaptive Gradients in the Coastal Environment: Recognizing the Role of Infrastructure in Resilience.”

“That’s sort of where we want to end up,” says Hamin. “Climate change and resilience are not exotic.”

To share what she and her colleagues have learned, Hamin is collaborating with UN-Habitat on web-based training modules to be shared with teachers around the globe. To develop the modules, Hamin worked with colleagues in South Africa and Australia compiling relevant climate-adaptation information and organizing it into an accessible online format. Their aim is to provide pedagogic content that teachers can readily draw on as they work toward adaptive solutions to climate-change impacts. Hamin also serves as a co-principal investigator on the campus’s NSF-funded Offshore Wind Energy Integrative Graduate Education and Research Traineeship (IGERT) program, where she helps train the next generation of wind-energy leaders. She focuses on understanding the intersection of public acceptance and the technological effectiveness of proposed wind farms, one of the program’s three major research thrusts.

With new NSF funding Hamin is expanding her field research beyond the East Coast, working with co-principal investigator Don DeGroot (civil and environmental engineering). They will develop a network of planners, researchers, and policy experts from the Northeast to the Caribbean. Their goal is to devise a framework for climate-change resiliency that improves coastal infrastructure planning and mitigates the impacts of such fast-onset disasters as hurricanes and tsunamis while incorporating plans for such slow-onset threats as sea-level rise.

Hamin’s road to regional planning was indirect. Fresh from business school, she began her career in real estate development. She enjoyed the planning element of that work but soon began to question the morality of certain projects that encroached on open space and special environmental areas. Deciding that she wanted to help communities make decisions for themselves, she changed her academic path.

“I thought I could use some of what I learned for the forces of good, to empower communities and work with them to achieve their own goals,” says Hamin.
The College of Education’s Center for International Education (CIE) basked in glory last spring when David R. Evans, the center’s director and a professor in the Department of Educational Policy, Research, and Administration, was named an honorary fellow of the Comparative and International Education Society (CIES) during that organization’s annual conference in Toronto. Awarded in recognition of Evans’s lifelong work with such international agencies as the World Bank, UNESCO, USAID, and the Peace Corps, the fellowship is fitting recognition of the impact Evans and the College of Education have had in improving the quality of and access to higher education internationally.

In a letter announcing the award, CIES President Gilbert A. Valverde said of Evans: “The number of countries in which you have served is awe-inspiring. And while completing all of this important work, you still found time to author or co-author over 45 publications, papers, reports, and conference papers. Having chaired 80 completed doctoral dissertation committees and served on approximately 240 master’s committees, your contribution to future comparativists is one not to be rivaled. Your students have gone on to serve as ambassadors of the United States and other nations.”

All of which pleased Evans—to a point. In his mind, however, it gave too much credit to him personally.

“CIE is a participative community,” says Evans, who has been affiliated with the center for more than 45 years. “Our success is largely attributable to a very strong team that includes faculty, professional staff, and graduate students, and to our fruitful collaborations with a number of foreign governments.”

As has been widely reported, one of the most productive and enduring of those collaborations has been with the government of Afghanistan. Among other accomplishments, starting in 2008 CIE helped to establish the first functioning master’s degree program in that nation in at least 30 years. The program was turned over to Kabul Education University in the summer of 2013 and has now awarded degrees to 110 graduates in five cohorts.

“The key to the success of the master’s degree in education,” Evans explains, “was establishing a management infrastructure staffed by Afghan faculty members from the university. That helped make the program sustainable and served as a model which CIE has subsequently used to create similar programs at other Afghan universities.”

CIE’s involvement in higher education in Afghanistan began in 2006 with a five-year USAID contract to work with faculties of education. A $21-million follow-up contract broadened the scope to include strengthening the capacity of both the Ministry of Higher Education and the management of the universities. In January 2014, CIE was awarded a five-year, $23-million subcontract to continue the work with FHI360, a nonprofit human-development organization created by Family Health International and the Academy for Educational Development.
Thirteen UMass Amherst doctoral students from across campus received 2014 Eugene M. Isenberg Awards in recognition of their demonstrated academic merit and commitment to integrating science or engineering with management. The scholarships, established by the late Eugene M. Isenberg ’50 and his wife, Ronnie, are of up to $10,000 each annually and are intended to prepare recipients for leadership roles in high-tech ventures, corporate research and development, technically oriented businesses, and other entrepreneurial initiatives. Successful applicants must have completed at least one semester of graduate study at UMass Amherst with a 3.2 or better GPA, have an interest in integrating business fundamentals with science and or engineering, show intent to build on past accomplishments and explore the commercial potential of research or projects, and have strong written support from a graduate advisor.
The recipients are keen to put their funding to work. Javier Sabogal, environmental conservation, studies the water-energy nexus and is happy to be exploring real-world applications for the research he did for his Ph.D. dissertation. “The growing use of hydropower,” he explains, “brings many benefits but also presents major challenges for its impacts on social systems and ecosystems. I therefore developed a Hydro Corporate Social Responsibility Model (HCSRM) to help hydropower projects balance stakeholder needs and ecosystem requirements in order to reduce impacts and increase benefits.”

This fall, Sabogal is testing HCSRM’s business plan and will determine its organizational structure, legal aspects, corporate image, and networks. He will also apply his research framework to study several cases in Latin America and North America, and seek additional funding and strategic partners. Sabogal’s project has already sparked interest by MIT’s Center for Collective Intelligence crowd-sourcing community and was a semifinalist in the Center’s Climate CoLab Energy Supply contest. Along with being given modest funding, contest winners are connected with people who can support their proposal implementation, such as policy-makers, business executives, NGO and foundation officials, scientists, and others.

Another recipient, Sara Saberi, operations and information management, is developing a business model for ChoiceNet, a new architecture for the future Internet. “The Isenberg Award,” she says, “will enable me to conduct the experimental study, determine appropriate dynamic contracts for different time-scales, and construct an appropriate business model to ascertain benefits. My findings might lead to new practice opportunities by determining how Internet service providers can best deliver value to the users by encouraging them to pay for that value and by boosting profits for Internet service providers.”

“My ultimate goal is to earn my Ph.D. and work in a field at the convergence of science and business where I can effect change in how we treat infectious disease.”
— Sandra Roy, Isenberg Scholar

For her part, Sandra Roy, animal biotechnology and biomedical sciences, will use the funding in support of her work developing novel antimicrobials to treat catheter-acquired urinary tract infections. “I utilize bacteriocins, proteins naturally produced by bacteria to mediate their interactions with other bacteria,” she explains. “These proteins are narrow-spectrum, targeting only one or a few species of bacteria. Contrary to traditional antimicrobials, which are broad-spectrum and decimate commensal microflora during use, bacteriocins can target the pathogen that is causing the infection while leaving beneficial commensal flora intact.”

Roy notes that her Isenberg Award will allow her to focus solely on research and not have to take on a TA assignment and to be able to afford critical research procedures. She describes her work as “very translational in nature” and says, “I am currently engaged with one company interested in pursuing this approach to treating disease. My ultimate goal is to earn my Ph.D. and work in a field at the convergence of science and business where I can effect change in how we treat infectious disease.”

The full list of this year’s recipients follows. They bring the total number of Isenberg Awards granted since 1995 to 138.

**2014 Eugene M. Isenberg Award Recipients**

- David Agongo: operations and information management
- Cole Fitzpatrick: civil and environmental engineering
- Timothy Gehan: chemistry
- Ryan Guggenmos: accounting
- Daniel King: polymer science and engineering
- Michael Prokle: industrial engineering and operations management
- Sandra Roy: animal biotechnology and biomedical sciences

Sara Saberi: operations and information management

Javier Sabogal: environmental conservation

Akshaya Shamgum: electrical and computer engineering

Bicheng Wu: food science

Xiaohui Yang: finance

Yueyun Zhao: operations and information management department

Berthiaumes Underwrite New Entrepreneurship Center

Longtime UMass Amherst supporters Douglas and Diana Berthiaume have presented the campus with a $10-million gift to form a world-class Center for Entrepreneurship within the Isenberg School of Management. Douglas Berthiaume, a 1971 management school graduate of UMass Amherst, is chairman, president, and CEO of Waters Corp. of Milford, Mass., and a co-chair of UMass Rising, the university’s $300-million campaign.

"Over the past 20 years," he says, "I have become intimately involved with a number of aspects of the university, including the schools of management and the environmental sciences. I have seen firsthand how great research, a committed faculty, and private partnerships give students a richer learning environment. Diana and I look forward to seeing the impact this new center will have across the university."

The Douglas and Diana Berthiaume Center for Entrepreneurship will be the hub of a campus network of scholars, innovators, and entrepreneurs with the threefold mission of supporting research, education, and practice targeted at transforming ideas into business realities. The Berthiaumes’ donation builds on the couple’s extraordinary support for the university, which includes a previous gift of $5 million in support of Isenberg School initiatives.

“We are grateful for this most generous gift from two of the university’s greatest benefactors,” notes UMass Amherst Chancellor Kumble R. Subbaswamy. “It speaks volumes about the education Doug Berthiaume received here in Amherst and about his understanding of the power of education to foster innovation in the real world. Because of Doug and Diana, the Center for Entrepreneurship will be a world-class initiative, able to apply the fruits of research done across the university’s flagship campus to improve businesses throughout the commonwealth, the nation, and the world.”
Linda R. Tropp is dedicated to recognizing, comprehending, and eliminating racism and discrimination in our society. Many Americans, of course, would like to believe that these scourges no longer exist. Alas, they do, both in their old, familiar forms and in new and subtler guises. Therein lies the endless challenge of Tropp’s work.

As a professor of psychology and the director of the UMass Amherst’s Psychology of Peace and Violence Program, Tropp studies how members of different groups approach and relate to one another and how group differences in power or status affect views of and expectations for cross-group relations. Last May, as a featured speaker at the second Congressional Seminar Series, held in Washington, D.C., by the Society for Psychological Study of Social Issues, she discussed the ways in which race-based discrimination continues to affect everyday interactions and policy choices.

It is difficult, Tropp told her audience, to specify the extent to which discriminatory or prejudicial beliefs influence public policy on such social issues as affirmative action and immigration, or on such law-and-order issues as stop-and-frisk or stand-your-ground laws. Even so, she emphasized, it is important for policymakers to understand the role that bias and discrimination can play and to recognize potential biases in how constituents and politicians frame, interpret, and evaluate policies and programs, because policies that may seem race-neutral in the abstract can, once implemented, have considerable racially differential consequences.

Of one misconception widely held in the wake of Barack Obama’s election in 2008, Tropp said: “The truth is, we do not live in a post-racial society. People see race and continue to be treated differently on the basis of race, so racial bias and discrimination still have major impacts in our lives and in our communities. But even though we live in a shared society, we don’t all necessarily see bias and discrimination in the same way.”

Tropp went on to summarize studies showing the tenacity of racial bias across many sectors, including education and employment, and the ways in which it continues to have a demonstrably ugly effect.

Tropp works hard to expose and eliminate such bias. Evidence of this is her service as a research advisor with the National Coalition on School Diversity, which presses for greater racial and economic integration in U.S. Department of Education programs. “The coalition,” Tropp explains, “includes policy advocates and research advisors who share information and are prepared to take action when events or cases arise relevant to diversity and racial integration in schools.”

Other examples of her influence abound. In 2011 Tropp provided expert testimony on the benefits of intergroup contact and racial integration to the Minnesota Education Commission Task Force on Integrated Schools. She has served as an expert reviewer for amicus curiae briefs submitted by the American Psychological Association and the American Education Research Association to the U.S. Supreme Court on cases concerning school-based racial-integration programs. Tropp has contributed scientific knowledge and feedback on briefs prepared by the NAACP Legal Defense Fund and the Equal Justice Society for a case on the role of race in university admissions, and was a signatory on one of those briefs. And her work has been widely cited in briefs submitted to the Supreme Court by the American Psychological Association for other high-profile cases relevant to affirmative action.

Moreover, through her leadership of UMass Amherst’s Psychology of Peace and Violence Program, Tropp helps assure that others will continue to carry on such work, both in this country and abroad, long into the future. The program, launched in 2004 by a private endowment and matching support through the university, is a pioneer in using scientific knowledge to resolve conflict, promote reconciliation, and build peaceful relations between groups around the world. Students and faculty in the program study why group relations become hostile and how to promote cooperation and nonviolent strategies in conflict reduction and resolution. The program trains doctoral students in basic social psychological theory and research—all with an emphasis, like Tropp’s, on translating this work for policy and applications to real-world contexts of conflict.

Of her work in general, Tropp says: “If the bad news is that many people harbor prejudices they might not be aware of, the good news is that there are well-established strategies for overcoming them. They include teaching about subtle forms of racial bias and encouraging people to reflect on and replace negative stereotypes. We can also foster opportunities to engage in genuine cross-racial or cross-cultural contact at work, in neighborhoods, public schools, and elsewhere. I believe that as a society we have both the will and the way to achieve greater understanding between groups.”
Since its establishment in 1973, UMass Amherst’s Arts Extension Service (AES) has been stimulating the growth of arts and culture across Massachusetts and New England. Initially founded and directed by State Senate President Stan Rosenberg after his graduation from UMass in 1977, AES was created to extend the campus’s cultural and educational resources into the community. Continually challenged to adapt to growing needs and changing times, current AES Director Dee Boyle-Clapp ’88MFA has embraced the idea of applying entrepreneurial thinking to the arts in order to help artists and arts communities thrive. Funded by a grant from the vice chancellor for research and engagement and run in collaboration with the College of Humanities and Fine Arts, AES now hosts the Arts Entrepreneurship Initiative, designed to assist current UMass Amherst students, alumni, and area artists gain the skills and connections they need to grow their arts-based businesses.

According to Jeff Cox, chair of the Department of Music and Dance and an Arts Entrepreneurship Initiative collaborator, educating humanities and fine arts students must go beyond developing expertise in their specific field. “In today’s world,” says Cox, “students need to develop their artistic abilities and become more aware of and proficient at envisioning the wide variety of ways in which they can interface with the community!” Cox and Boyle-Clapp oversaw an in-depth alumni survey in which arts and humanities alumni reported having had wonderful experiences and arts training at UMass Amherst, but many were disappointed at not having been taught how to go on to make a living from their work. “In addition,” adds Boyle-Clapp, “when alumni who were no longer working in the arts were asked why they left their field, it almost all came down to money. We said, ‘This has got to change.’ That was the kernel for the Initiative.”

In response to the artists’ needs, AES partnered with Dan Gordon, chair of the campus’s Bachelor’s Degree with Individual Concentration (BDIC) program, and Jonathan Kuuskoski, director of music entrepreneurship at Missouri State, to create a “Foundations in Arts Entrepreneurship” course for students in the humanities and fine arts to help them with the business side of the arts profession. The course was first taught online by Kuuskoski and Boyle-Clapp’s colleague Todd Trebour, and this spring was taught on campus by Trebour and Boyle-Clapp.

“This class was the first opportunity we’ve had to work with students on campus to help them develop their own business ideas and to discuss the many important considerations in learning how to make a living as an artist,” says Boyle-Clapp. “We help them begin transitioning from being student-artists into arts professionals by providing the basic groundwork in how to do it and how to think of their art not as a ‘practice,’ but as their job.”

At the same time, Boyle-Clapp had been co-teaching an “Arts and Culture Internship” class with Caroline Gould, assistant director of career planning. Their goal was to connect humanities students with arts internships, which seemed elusive in the Pioneer Valley despite its reputation as an arts and culture mecca. “Internships are common in the business world, but less so in the arts,” says Boyle-Clapp.

Having connections to the group developing the Creative Economy Plan for Hampshire County, home to UMass Amherst, Boyle-Clapp learned there were more than 700 artist-based businesses in Hampshire County alone. Her goal is to connect the 6,000 arts and culture students at UMass Amherst to those 700 businesses for internship and mentoring opportunities. “We want to help connect established artists to this incredible network of opportunity at UMass Amherst—an Arts Extension curriculum, student interns, and an opportunity for area artists to share with other artists,” says Boyle-Clapp.

“This area has many jobs dependent upon the arts and the creative economy. This work will contribute directly to the regional economy by helping to build stronger artists and artist communities.”

— Dee Boyle-Clapp, Director, Arts Extension Service

According to Trebour, there are a few reasons why mentoring in the arts is so important. “People’s fields are really specialized,” he notes, “and sometimes you need to talk to someone in your field who’s been there in order to find answers. Established artists who are ready to give back or to train the next generation can help young artists not make the same mistakes they did.”

With so much potential to connect campus to community and with so many pieces of arts entrepreneurship already in play, Boyle-Clapp and Cox drew up a plan to formalize an initiative to expand what the campus was already doing and provide a home base for area information and activity in arts entrepreneurship. With financial support from the vice chancellor for research and engagement, the Arts Entrepreneurship Initiative was launched in the fall of 2014, making the Arts Extension Service and UMass Amherst the hub of arts entrepreneurship in the Valley.

“I’m grateful to Vice Chancellor Malone for not only engaging in this concept and supporting this project but for bringing the resources of the university to help support artists,” says Boyle-Clapp. “Working together with our community, we will build something unique and fresh. The fact that UMass Amherst has so many resources to share with artists to help them thrive in business is going to be increasingly important not only to individuals, but to the Pioneer Valley community as well.”
Kurose, Arun Venkataramani, Tilman Wolf, and Michael Zink are key players. Along with world-renowned UMass operations management expert Anna Nagurney, they are part of a core faction of researchers helping to create the next-generation Internet.

“The fact that our campus was selected to take a leadership role on two of the five FIA projects speaks volumes about our faculty expertise,” says Mike Malone, vice chancellor for research and engagement. “We take an interdisciplinary approach to science, which is critical to an initiative of this size.”

Kurose, Venkataramani, and Zink are part of FIA’s MobilityFirst project, led by a team at Rutgers University and aimed at designing an alternative Internet architecture with mobility and security as the driving goals. When the Internet was standardized there were no mobile devices, yet now such devices are in the majority. Kurose explains that it makes little sense to have such an important network designed to connect with outdated technology.

“If mobility is the norm,” he says, “we really want to think about building a network architecture that takes mobility as a first-class concern and organizes the whole architecture around it.”

With Venkataramani as lead architect, the UMass team is working with colleagues at Rutgers, the University of Wisconsin-Madison, the University of Michigan Ann Arbor, Duke University, MIT, and the University of Nebraska-Lincoln to build the overall architecture, put protocols in place to substantiate the architecture, and develop working prototype code.

According to Venkataramani, issues of mobility and security can be addressed simultaneously by separating names, or endpoint identifiers, from their addresses, or network locations. By conflating the two, he says, the current system poorly supports mobility and leaves IP addresses vulnerable to hijacking. A key innovation in MobilityFirst is the Global Name Service, or GNS—software designed specifically to support mobility in a seamless, secure manner. Logically centralized but physically geo-distributed, GNS is a cloud-based infrastructure that maintains information about people and their associated locations and enables “context-based communication,” meaning that it generalizes name- or address-based communication. In developing the technology, the team realized its potentially revolutionary implications for notification systems around the globe. Because the software stores basic identification information, can pinpoint one’s various mobile devices (phone, iPad, or even a car GPS), and can send contextualized messages, it is easy to imagine how it could alert people traveling in a certain direction of an imminent traffic obstruction or even a developing tornado. It can also customize different messages to different people—for example, one warning to senior citizens and a different one to first responders.
Wolf and Nagurney are leading another FIA project, ChoiceNet, an Internet “economy plane” designed to provide greater economic incentives for service providers and more options for users. Imagine sitting down to a movie marathon on a rainy Sunday with your family and purchasing, for that day only, high-speed, high-definition streaming options. Or imagine working from home while your office is being renovated, and purchasing high-speed options for just two weeks rather than for a whole month or more. Wolf and Nagurney say that such options would not only be more convenient for users but would force competition between service providers, leading to better technologies overall and more competitive prices. “Our project is about giving people choice,” says Wolf. “We’re trying to think about how we can restructure Internet architecture so that we can actually incentivize better technologies overall and more competitive prices. ChoiceNet, he explains, opens new doors for network-based services and builds economic relationships for services across various time scales.

Wolf, the project’s PI, is leading a team across the UMass Amherst, UKentucky, NC State, and UNC campuses. An engineer, he partnered with Nagurney to ensure that the technology he is developing includes the right economic incentives. Nagurney and her graduate students are investigating the behavior of various stakeholders in order to better understand the competitive environment and its pricing, service-quality, and provider-profit implications.

Zink, also a co-director on the campus’s CASA (Collaborative Adaptive Sensing of the Atmosphere) Engineering Research Center, is working with other colleagues on a subsequent grant to layer their advanced radar technology over the GNS to enhance its capabilities. As a planned field trial, Zink and his colleagues will work in coordination with the National Weather Service and the CASA radar test bed in Texas to demonstrate the effectiveness of context-based hazardous-weather warning apps.

One important aspect of the network being worked on in all FIA projects is “caching”—finding ways to more efficiently utilize storage. In the current model, the vast majority of storage and computation happens at the edge of the network, while the hardware inside the network is relatively slow and storage-poor. To that point, NSF’s Global Environment for Network Innovation (GENI) program was launched along with FIA as a way to test new network architectures with a more cutting-edge network that implements advanced hardware. Because the Internet serves billions daily, it has been difficult to experiment with alternative Internet architectures while in “production mode,” which Kurose likens to “changing the engine of an airplane while it’s flying.”

The GENI program addresses that issue by funding projects to help build a smarter, faster experimental platform on which to test the FIA projects and other Internet-advancing projects around the globe. The platform is a working infrastructure strictly for research traffic, not commercial. In a project closely aligned to GENI through an NSF CC-NIC (Campus Cyberinfrastructure – Network Infrastructure and Engineering) grant, Zink says that he and his colleagues will soon install new switches to connect UMass Amherst with the Massachusetts Green High Performance Computing Center in nearby Holyoke, a data center dedicated to research computing. A platform called NSF-Net predates GENI, having been used since the 1990s, before the Internet was commercialized in 1993. Now that the Internet is used by so many on a day-to-day basis, Zink explains, the industry is more likely to insert the GENI platform’s more advanced aspects into the current model than to switch to an entirely new system. “I think they’ll adopt whatever’s interesting for them,” Zink says.

Electric Fish Genus and Species Discovered

As reported in the Proceedings of the Academy of Natural Sciences of Philadelphia, UMass Amherst biologist Cristina Cox Fernandes and colleagues at Brazil’s Instituto Nacional de Pesquisas da Amazônia have discovered a new genus and species of electric knifefish in tributaries of the Rio Negro in Amazonia. True to their name, these fish produce electric discharges in distinct pulses that can be detected by other fish. Cox Fernandes says the discovery is leading to a new interpretation of classifications and interrelationships among closely related groups. She adds that as the diversity of electric fishes becomes more thoroughly documented, researchers will be able to explore possible causes of their adaptive radiation over evolutionary time.

Super Adhesive Gets Trademark, Goes Green

Traditional adhesives, usually petroleum-based and often single-use, are a sustainability challenge. At UMass Amherst, however, the inventors of flexible, reusable Geckskin—of which an index-card-sized swatch can support hundreds of pounds—have now redesigned it using renewable materials. “Green Geckskin” has been trademarked by the university from the polymer science and engineering team of Professor Al Crosby and researcher Michael Bartlett. They, along with such others as biomaterials Professor Duncan Irshick, introduced Geckskin in 2012. The adhesive mimics a gecko’s ability to strongly and repeatedly attach its toes to surfaces and resist great forces. Bartlett and Crosby say that the shift toward sustainable adhesives could both have a significant impact on the environment and increase the adhesive’s effectiveness. They anticipate exciting applications for the product, including using it to easily apply and detach solar panels to provide a portable charge for electronic devices at several locations over the course of a day.

UMass Scientists Among the World’s Most Influential

Eight University of Massachusetts Amherst faculty members are among “the world’s leading scientific minds of our times,” according to a survey by multifocal national and international firms Thomson Reuters. The Thomson Reuters list recognizes as “2014 Highly Cited Researchers” food scientists Eric Deans, Dan McClements and Younghwa Park; chemist Vincent Rotello; polymer scientist Thomas Russell; soil chemist Baoshan Xing; microbiologist Derek Lovelock; and astronomer Mauro Giavalisco. They are all College of Natural Sciences faculty members.

“No matter what methodology we apply, we know that all eight of these researchers are engaged in incredibly high-quality science and are having truly significant impacts on their fields of study,” notes College of Natural Sciences Dean Steve Goodwin.

Faculty to Study Research Impacts on Regulatory Policy

UMass Amherst political scientists Bruce Desmarais and John Hird have been awarded $527,233 from the National Science Foundation to study how scientific research informs regulatory policymaking. Using the best available scientific evidence is an important component of effective rulemaking and is legally required by executive orders signed by U.S. presidents from Reagan through Obama. The scientific basis
because only a subset of cell types are carbohydrates that form the cell original shape. This grant is helping of the material that’s used and its are very different, in part because the difference between building a secreted by cells help determine fundamental processes of plant shapes and patterns. NSF Grant Funds Study of Plant Shapes and Patterns Plant cell biologist Magdalena Bezanilla received a four-year, $600,000 grant from the National Science Foundation to further her award-winning research on fundamental processes of plant growth, in particular how molecules secreted by cells help determine plants’ outer shapes and patterns. “Think of it,” she explains, “as the difference between building a short, round adobe house and a long, tall steel skyscraper. The shapes are different, in part because of the material that’s used and its original shape. This grant is helping us explore how the cell controls the delivery of new building blocks of the extracellular matrix, which in plants are carbohydrates that form the cell wall and contribute to its function within a leaf, stem, or root.” Bezanilla notes that secretion of extracellular matrix in animals may lead to the formation of bone or an outer shell, for example, but because only a subset of cell types build these complex structures in a single organism, it can be difficult to study these processes in animals. But in plants, all cells build a wall, making the processes easier to study.

Campus Economists Among Top ‘Global Thinkers’ Three UMass Amherst economists who found serious errors in a key study that lawmakers around the globe have used as a cornerstone of austerity policies were counted among Foreign Policy magazine’s “100 Leading Global Thinkers of 2013.” Graduate student Thomas Herndon and professors Michael Ash and Robert Pollin were included in the list’s “Challengers” category. The three received worldwide acclaim in April 2013 after posting online a working paper challenging a study by a pair of Harvard economists that had long been held as a justification for implementing austerity cuts in times of slow economic growth.

Old Moon-Origin Theory Gets New Respect The long-accepted notion that our moon formed when a Mars-sized body crashed into the young Earth and knocked off part of its outer mantle may be about to take a tumble. Donald Wise, professor emeritus of geosciences, wrote in the January issue of Physics Today that new models proposed in 2012 assume “starting conditions” similar to those in a long-abandoned lunar origin model that he and several others put forward in the 1960s. These conditions eliminate obstructions that once seemed insurmountable and explain how the moon may have formed directly from Earth’s mantle, with no need for a giant impact. It’s time, Wise suggests, that “our quest to answer one of mankind’s oldest questions expand to include this simpler hypothesis.” He claims that the underpinnings of currently accepted “giant impact” lunar origin models are far shakier than generally recognized, in that they all fail a major test. No evidence of impact contamination by a non-Earth body has ever been found on the moon. Wise notes that increasingly precise isotopic and chemical analyses developed over the last 40 years show lunar rocks to be identical with Earth’s mantle — in some cases to parts per million — yet “the impact model has so permeated our understanding that most people believe the origin of the moon was by giant impact.”

Turbulence Research Awarded DoD Frontier Project Grant Associate Professor Steve de Bruyn Kops, mechanical and industrial engineering, leads one of two teams awarded inaugural Frontier Project grants from the Department of Defense (DoD) High Performance Computing Modernization Program. De Bruyn Kops’s project, “Multiscalar Interactions in Stratified Turbulence” will use high-performance computing to simulate turbulence in fluids strongly affected by gravity. As de Bruyn Kops explains, turbulent flows are all around us and are always complex. In fact, turbulence is considered to be one of the hardest classical physics problems. The objective of this research is to understand very fundamental aspects of fluid turbulence, with the results to be applied to reducing drag in underwater vehicles, improving sensor systems such as radars, and advancing local-scale weather predictions.

The DoD has awarded the project $750,000 over five years and provided high-performance computing resources for it. These include 528 million hours of computing time, storage for several petabytes of data, and technical expertise for managing large data sets.

Energy Technologies Pay Off, However Climate Policy Evolves Erin D. Baker, associate professor of mechanical and industrial engineering, and Senay Solak, assistant professor of operations and information management, recently reported in the journal Production and Operations Management on their finding that investing in energy technologies to deal with climate change will always pay off, regardless of whether it is done as part of a go- slow policy research or pursued more aggressively. Baker and Solak claim that even under very different climate policy regimes the same technologies top the list for investment, and that governments can confidently invest in research in such breakthrough energy technologies as solar, nuclear, and carbon-capture without knowing exactly how politics and science will end up shaping climate policy.

Cheaper, Faster, Better Gene Sequencing Murugappan Muthukumar, the Wilmer D. Barrett Professor of Polymer Science and Engineering, received a four-year, $1.08-million grant from NIH’s National Human Genome Research Institute to find new ways to control the reading of the precise order of nucleotides in DNA chains as they pass through a nanoscale DNA sequencer chip. The work should lead to cheaper, faster, and more accurate gene sequencing for medical research and healthcare. In present systems, single molecules of DNA often either move through the sequencing platform too fast to be read accurately or else they stutter—take molecular steps backward and forward and end up being read more than once.

NSF Grant Funds Study of Plant Shapes and Patterns

Improving Next-Gen Antimicrobial Separation Membranes Chemical Engineer Jessica Schiffman received a two-year, $74,000 grant from the National Science Foundation to improve ultrafiltration membranes, a vital separation technology in drinking-water purification plants and a broad range of industries including beverage clarification, blood filtration, treatment, protein purification, and metal ion recovery. Schiffman’s project, “BRIGE: Engineering Antifouling Ultrafiltration Membranes Using Polyacrylonitrile Nanofibers,” was one of only 21 funded from among some 260 applications.

Ultrafiltration is used to separate impurities from liquid streams by using hydrostatic pressure to force a fluid through a semipermeable membrane. The process holds back solids and solutes of higher molecular weight while allowing fluid and solutes with lower molecular weights to pass through the membrane. The membrane also filters out algae, fungi, sand, and other impurities.

NICI Grant Targets Key Enzyme to Fight Cancers and Other Diseases Immunologists Barbara Osburne and Lisa Minter will share a five-year, $4.8-million National Cancer Institute grant to target multiple diseases including cancer, Alzheimer’s, and graft-versus-host disease by manipulating an enzyme that activates over 100 different protein substrates in the body. The NICI grant supports groups of investigators at four different laboratories, two at UMass Amherst,
Education Faculty to Provide Evaluation Research and Services
The National Science Foundation awarded $862,895 to Martina Nieswandt and Elizabeth McKeanney, both of teacher education and curriculum studies, to analyze, evaluate, and compare small-group work on inquiry-based tasks and engineering-design tasks in high-school science classes.

The College of Education’s Center for International Education, assisted by the Center for Educational Assessment, was awarded a $597,597 contract from the International Rescue Committee (IRC) to provide evaluation services for the IRC’s project to increase girls’ access to education in the Democratic Republic of the Congo. Leading the two-year project are Bjorn Nordrevest and Jennifer Randall (educational policy, research, and administration).

Study to Track Indoor Air Pollution Impacts on Tribal Communities
The U.S. Environmental Protection Agency awarded environmental health scientist Richard Peltier a three-year, $700,000 Science to Achieve Results (STAR) grant to measure indoor air quality in tents used by Native American subsistence hunters in subarctic North America to determine possible health effects of wood-smoke exposure and to provide culturally relevant recommendations for mitigation. Peltier will lead one of the few environmental health science teams qualified to conduct this investigation. He says that the research has observational and intervention components and partners with First Nation members in community-based participatory research. The study aims to provide information on the effectiveness of various emissions mitigation methods and to improve understanding of multi-pollutant emissions from burning various types of biomass indoors.

New York Times Praises Vonsattel Recital
Music and dance professor Gilles Vonsattel’s solo piano recital in April at Bargemusic in New York City drew extraordinary praise from New York Times critic Zachary Woolfe, who called it a “tightly conceived and passionately performed ... study in seriousness and intensity.”

For one of the most demanding pieces on the program, Heinz Holliger’s Partita, Vonsattel received a Faculty Research Grant from the College of Humanities and Fine Arts that enabled him to travel to Switzerland to work with Holliger while learning the composition. In addition, funds from the grant paid a portion of the cost of producing a Partita recording released in June on the Genuin label.

“While the applause afterward was strong,” Woolfe concluded, “both Mr. Vonsattel and his listeners seemed exhausted, as though everyone had been through a long journey. That the audience did not demand an encore seemed the greatest compliment it could pay.”
**SPONSORED ACTIVITY**

**Fiscal Year 2014 Sponsored Research**

Proposals Submitted: 1,365

Proposal Dollars: 663.9 million

Awards: 1,083

Award Dollars: 165.5 million

Research and Development Expenditures: 194.8 million*  

*R&D expenditures as reported by the UMass President’s Office 2012 Report on Annual Indicators University Performance Measurement System.

**FY 2014: Distribution of Awarded Dollars by Sponsor Category**

- **Federal**
  - Non-Profit (Private Sector) 327
  - Industry (Private Sector) 260
  - Commonwealth of MA 56
  - Other State & Local Govts. 12
- **Non-Profit (Private Sector)**
  - Other Colleges & Universities 25%
  - Foundations 11%
  - 3% Other Sponsors 56
- **Institutes & Associations**
  - USDA 39%
  - NSF 15%
- **Industry**
  - 2% SBA 4%
  - 1% NASA 6%
  - 2% DOE 9%

**FY 2014: Distribution of Award Dollars from Federal Agencies**

- **DOE**
  - 2% SBA 4%
- **NSF**
  - 1% NASA 6%
- **USDA**
  - 2% DOE 9%

**FY 2014: Distribution of Award Dollars from the Private Sector**

- **Institutes & Associations**
  - 39%
- **Foundation**
  - 15%
- **Institutes & Associations**
  - 2% Other Sponsors 56
- **Industries**
  - 38%

**FY 2005-2014: Award Dollars - Three-Year Rolling Averages**

**Access the campus's full sponsored activities report at:**

www.umass.edu/research

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**TECHNOLOGY TRANSFER**

**FY 2014 BY THE NUMBERS**

- 48 Invention disclosures received
- 40 Patent applications filed
- 16 Patents issued
- 16 License and option agreements executed
- Revenue received: $753,000

**LICENSES WITH UMASS START-UP COMPANIES**

**Felsuma**

Felsuma LLC entered into an exclusive patent and trademark license agreement with UMass Amherst. Felsuma is a startup incorporated to develop and commercialize the Geckskin™ technology developed by Al Crosby (polymer science and engineering), Duncan Irschick (biology), and others at UMass Amherst. The agreement covers a portfolio of Geckskin-related inventions and trademarks.

**Innovation Accelerator**

Innovation Accelerator, a startup company based in West Brookfield, Mass., and founded by former UMass Amherst graduate student and postdoctoral researcher Tony McCaffrey, has entered into an exclusive software and patent license agreement with the university to commercialize various software developed by McCaffrey while he was on campus. The company is headed by James Pearson, an alumnus of UMass Amherst’s Department of Mechanical and Industrial Engineering. Innovation Accelerator’s first product, Analogy Finder software, provides an innovative way to search for patents related and possibly adaptable to a user’s unique ideas or technical needs.

**Sonation**

UMass Amherst granted an exclusive copyright license to Sonation, a startup company created by Chris Raphael, former campus professor of mathematics and statistics. Sonation’s first app, Cadenza, enables musicians to perform accompanied by a recording of a full band or orchestra. Sonation licenses recordings of orchestras made in special sessions during which the solo part is left out. These are then synchronized with users’ music in real time, enabling them to play solos with an accompaniment dynamically adapted to their performance.

**New Energy Storage Technology**

A global company headquartered in Japan has entered into a license agreement with UMass Amherst for a new energy-storage technology. The license covers a promising battery technology developed by Jim Watkins and Yuying Tang, both of the Department of Polymer Science and Engineering, and researchers at the company. It provides an efficient, low-cost route to making battery devices with improved properties and safety. Product-development efforts within the company are underway.

**Alphabet Energy**

Alphabet Energy Inc. has entered into a license agreement with UMass Amherst for a new technology that allows turbines to convert waste heat into power. The license covers a turbine developed by Tom Russell and Dong Hyun Lee, both of UMass Amherst’s Department of Mechanical and Industrial Engineering, and researchers at the university. The agreement covers a thermoelectric material technology for energy conversion developed by Tom Russell and Dong Hyun Lee, both of UMass Amherst’s Department of Polymer Science and Engineering, and researchers at the University of California and the Lawrence Berkeley National Laboratory. Alphabet Energy, a premier thermoelectrics, company, developed the first turnkey thermoelectric generators for waste-heat recovery.

**ADDITIONAL LICENSING ACTIVITY**

**Felsuma**

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The University of Massachusetts Press publishes books of outstanding scholarly and artistic merit and distributes them as widely as possible, contributing to the stature of the university as a center of innovative research and sustaining the university's contribution to a national and international conversation centered on new ideas and insightful scholarship. The press's peer-reviewed books, many of them award winning, are offered at affordable prices in a variety of print and electronic formats. Editorial is overseen by a faculty board whose members represent a broad spectrum of academic departments.

In FY14 the press published 33 new titles and sold a total of 37,241 books and e-books. Revenues amounted to $767,561. Among the notable awards received by UMass Press books were the following:


Press Welcomes New Director
After serving as director of the University of Massachusetts Press for 32 years, Bruce Wilcox retired in May. Mary Dougherty, who comes to the university after 15 years in college-textbook publishing, has taken on his role. Most recently, Dougherty worked at Bedford/ St. Martin’s, a Macmillan imprint, as the publisher for history, responsible for print and digital editorial strategy. She holds a Ph.D. in American literature from Rutgers University.


Writing Dissertation and Grant Proposals: Epidemiology, Preventive Medicine, and Biostatistics, Lisa Chasan-Taber (Chapman and Hall, 2014).


Black Resonance: Iconic Women Singers and African American Literature, Emily Lordi (Rutgers University Press, 2014).


Principles and Practice of Sport Management, 5th edition, Lisa Maturalexis, Carol A. Barr, and Mary Huns (Jones & Bartlett Learning, 2014).


Griddler: Why Global Cooperation is Failing When We Need It Most, Kevin Young with Thomas Hale and David Held (Durham University Press, 2013).