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The mission of the University of Massachusetts is to provide an affordable and accessible education of high quality and to conduct programs of research and public service that advance knowledge and improve the lives of the people of the Commonwealth, the nation, and the world.

The data in this report reflects activities from July 1, 2012 – June 30, 2013.
Publication date January 2014.
Dear Friends and Supporters:

It is my pleasure to provide you with this report on the campus’s fiscal year 2013 achievements in research, scholarship, and creative activity.

As the commonwealth’s flagship campus, UMass Amherst stands for many things—inspiring faculty, accomplished students, successful alumni, and leadership in research and innovation. The campus also stands for Massachusetts, contributing to the commonwealth’s stature as a national leader in education, science and technology, and economic development. As evidence of this, the governor announced in June a $95 million capital grant to the campus from the Massachusetts Life Sciences Center to fund creation of the UMass Institute for Applied Life Sciences (page 3). The institute’s three unique translational research centers will enhance the campus’s ability to engage industry by linking academic leaders in their field with industry strengths, spurring growth of the regional life sciences ecosystem. The collaborative effort will catalyze technology development so that scientific discoveries and innovations can be translated more swiftly into products and services to benefit the public.

When the Massachusetts Gaming Commission sought to understand the economic and social impacts of introducing casino gambling in the state, they selected a research team from the campus’s School of Public Health and Health Sciences to lead the way (page 12). Funded by a $3.64 million Gaming Commission grant, this first-of-its-kind project will create a monitoring system to provide a neutral database for analysis and decision making as well as generate early detection of changes in social and economic impacts related to legalized gambling. This research will create an important database resource for stakeholders in Massachusetts and beyond.

The campus’s pipeline of talented students continues to support the commonwealth’s innovation economy. Private gifts for research, scholarship, and creative activity provide much needed support to our top students today and to the rising stars of tomorrow. Michael Hluchyj ’76 and Theresa Hluchyj ’77 know this well. They established an endowed fellowship in their name to support graduate students on the leading edge of interdisciplinary research in engineering and nursing with the goal of improving clinical health care (page 20).

These stories, and others in this report, exemplify what a flagship campus is all about: leadership in research, scholarship, and creative activity that positively impacts the citizens of Massachusetts and beyond. On behalf of the campus, I thank you, our friends and supporters, for standing with us to lead the way toward a brighter future.

Sincerely,

Michael F. Malone ’79PhD
Vice Chancellor for Research & Engagement
Ronnie & Eugene Isenberg Distinguished Professor of Engineering
The bulk of the capital grant ($95 million) enables outfitting of the campus’s new Life Science Laboratories, which will house three unique translational life science centers, while an additional $5.5 million will fund a fourth at the Pioneer Valley Life Sciences Institute (PVLSI), a partnership between the campus and nearby Baystate Medical Center. The centers will enhance the campus’s engagement with industry by linking academic leaders in their field with regional industry strengths. Partnerships will catalyze technology development so that scientific discoveries and innovations can be more swiftly translated into products and services to benefit the public.

Because each of these centers is being outfitted with state-of-the-art instrumentation unparalleled in the region, there is already keen interest in joint research. The capital funding, announced by Governor Deval Patrick on June 6 and awarded through the Massachusetts Life Sciences Center (MLSC), supports the application of fundamental life sciences research to areas where it can have the most impact.

“Our grant of nearly $95 million will enhance the university’s role in research and training, but it will also enhance the university’s engagement with industry by creating three new and cutting-edge centers on the UMass Amherst campus,” says Susan Windham-Bannister, Mass Life Sciences Center director.

**Industrial Collaborators Are Key**
The three centers—Personalized Health Monitoring, Models to Medicine, and Bioactive Delivery—along with the Baystate Healthcare Informatics and Technology Innovation Center each have a specific focus. Center concepts emerged from a process devoted to illuminating what lies at the intersection of industry needs and UMass Amherst research strengths. Spearheaded by the UMass Amherst Innovation Institute (UMII), this process involved more than 150 industry representatives and nearly 100 faculty members in dozens of community workshops, meetings, and review sessions.

“UMass Amherst is to be commended for engaging a broad cross-section of the Massachusetts life sciences community in this effort as well as its faculty. The programs will result in many opportunities for engaging and enhancing growth of companies both locally and throughout the region, from precision manufacturers to biopharmaceutical companies, health IT firms, and medical tech firms,” says Steve Gilman, executive vice president for R&D at Cubist Pharmaceuticals in Lexington, Mass.

The basic research framework underpinning these new centers has been in development at UMass Amherst for years. Now IALS will build on that framework by applying clinical and industrial networks to facilitate translation.

“Our key task is to quickly and efficiently move new technologies and scientific capabilities developed in our laboratories into the real-world economy,” says UMII Executive Director James Capistran. He notes that the authorizing legislation for this capital grant mandates a focus on UMass-industry collaborations to develop new commercial products and services in the life sciences. “We’ve streamlined the process so that all parties to our agreements can realize maximum benefit in a timely way that’s responsive to markets and business cycles.”

**New Centers Address Big Challenges**
The Center for Personalized Health Monitoring (PHM) is the largest of the three IALS centers. PHM scientists are working on multi-functional, wearable, wireless sensor systems that capture and analyze patient-level data in...
“UMass Amherst is to be commended for engaging a broad cross section of the Massachusetts life sciences community in this effort as well as its faculty. The programs will result in many opportunities for engaging and enhancing growth of companies both locally and throughout the region.”

—Steve Gilman, executive vice president for R&D, Cubist Pharmaceuticals

real time. From the electrical engineers working on the circuitry at the core of these devices, to the polymer scientists experimenting with ways to reduce their size, to the mechanical and industrial engineers creating product designs, to the kinesiologists conducting validation and testing—the PHM initiative uniquely employs a vertically integrated approach to research that will see biosensor development through from basic science to product testing.

“I can envision our local companies partnering with UMass Amherst in the development of new devices that can be transitioned to new products. I also appreciate the concept of having prototyping development facilities that are accessible to the precision machining companies. Having the ability to look at new products from design to prototyping would be extremely useful,” says Omer Gingras, president of the Western Massachusetts National Tooling and Machining Association.

Researchers in the Center for Models to Medicine center are translating fundamental discoveries in molecular biology and biochemistry into the identification and validation of new therapeutic targets. Their initial focus is protein homeostasis—a rapidly emerging field that seeks to illuminate the intricate mechanisms governing the expression, function, and fate of cellular proteins fundamental to the operation of many biological processes. A wave of discoveries over the last decade reveals imbalances in protein homeostasis in several diseases, such as Alzheimer’s,
Parkinson’s, and cancer. UMass Amherst has an international reputation in this field and will work with the pharmaceutical industry to revolutionize current strategies for discovering new drugs.

In the Center for Bioactive Delivery, expertise in polymer science, chemistry, and food sciences will be used to develop innovative drug delivery vehicles. Like special-delivery trucks, these agents will be optimized for specific payloads, thus increasing therapeutic precision by directing bioactive compounds to the right place at the right time in the right amount. The new funding will support carrier synthesis along with analytical, biophysical, and bioinformatics capabilities, enabling the center to move toward transforming the delivery field to a more predictable science. In drug development, where many products with on-target efficacy fail due to delivery issues, this more quantitative approach has potential to change the way we look at drug delivery products.

Each of the Institute’s three centers will be housed side by side in the new Life Sciences Laboratories. The new building also incorporates “collaboratory” spaces—laboratories specifically designed for temporary occupancy by industry researchers to facilitate collaboration between campus faculty and students with industry scientists.

Region to Benefit
To complement IALS, Baystate Medical Center’s new Healthcare Informatics Technology Innovation Center (HITIC) will serve as a test bed for product development. The MLSC funding supports HITIC hardware, network connectivity, and overall reconstruction to provide a space where products can be developed and tested. Simultaneously, biostatisticians at the UMass Amherst Institute for Computational Biology, Biostatistics, and Bioinformatics are using the Massachusetts Green High Performance Computing Center in nearby Holyoke to develop new tools for sifting through large amounts of data generated by personal monitors, biosensors, and patient-level studies.

IALS researchers are also forging partnerships with the UMass Medical School’s Center for Clinical and Translational Sciences (UMCCTS) to ensure their work can be tested in a clinical setting. In the area of personalized health monitoring, for example, UMass Amherst kinesiologist Patty Freedson and her team have joined forces with physicians David Ayers and Patricia Franklin at the UMass Medical School (Orthopedics and Physical Rehabilitation) to study physical activity and sedentary behavior in patients with osteoarthritis. Patients in the study wear an accelerometer sensor that differentiates postural positions. With funding through the UMCCTS Moment Fund, Freedson quantifies how much sitting, standing, and stepping osteoarthritis patients do and how these behaviors change during disease progression.

Within a small geographical area lies a critical mass of experts who are now joining forces across disciplines to bring about change. UMass IALS presents an enormous opportunity not only to impact human health but to expand regional economic development, education, and workforce training.

“This grant positions us for new directions in translational research and for increased engagement with industry and other educational institutions in western Massachusetts and throughout the Commonwealth. UMass is committed to growing these relationships to advance economic development as part of our land-grant mission,” says UMass Amherst Chancellor Kumble Subbaswamy.

umass.edu/ials
The new $160 million Life Science Laboratories opened in August 2013. Interdisciplinary collaborations are the focus of work being conducted in the labs.

BUILDING MOMENTUM
Life Science Laboratories open an avenue for innovation

The opening in August of the campus’s new Life Science Laboratories will facilitate the type of interdisciplinary collaboration and applied research that can shorten that gap between scientific innovation and technological advancement.

The opportunities afforded with the new building, which is part of the campus’s fast-growing life sciences precinct, lie in both its state-of-the-art facilities and the way research will be conducted. The design allows for a collaborative environment, encouraging cross-fertilization of ideas between researchers from various fields and from industry. The building is laid out to support current areas of interdisciplinary synergy, with extensive shell space in phase II being prepared to house millions of dollars in state-of-the-art equipment for the campus’s new Institute for Applied Life Sciences.

“You can share utilities and facilities; that’s always an attractive feature” says Malone. “But the real strength is the interdisciplinary nature of the labs. Universities were supported in the past because the disciplines were important, and they still are—after all, you can’t have strong interdisciplinary programs without strong disciplines. But now stakeholders also want more impact from research. They want human health, clean energy, safety and security, environmental quality, a creative economy. They want things that require combinations of disciplines.”

The new laboratory space, located in the northeast area of campus adjacent to Skinner Hall and the Integrated Science Building, will allow for interdisciplinary projects, yield more relevant results, and shrink the time span between question and answer.

“We anticipate that research conducted in this new facility will lead to products and services that can create new business opportunities. We’re on a push to increase the level of commercialization activity related to important discoveries,” adds Malone. A ribbon-cutting and building-opening ceremony for the Life Science Laboratories was held in October.
WHAT’S IN A SPREADSHEET?
Grad student Thomas Herndon exposes data flaws in a seminal theory of economics

UMass Amherst economics graduate student Thomas Herndon ’16 has become an international celebrity, though he never set out to be one. For one of his classes Herndon was asked to replicate the results of a study. He chose the seminal 2010 study by renowned Harvard economists Carmen Reinhart and Kenneth Rogoff that analyzed the relationship between post–World War II public debt and gross domestic product (GDP) growth in advanced economies. The study, widely cited as the basis for austerity policies in Europe and the U.S., argued that economic growth consistently tumbled once government debt exceeded 90 percent of a country’s GDP.

As he began working on the project, Herndon was unable to successfully replicate the results of the original study. Herndon contacted Reinhart and Rogoff, who sent him their original data. As Herndon reviewed the spreadsheet, he quickly found that a series of data errors and insupportable statistical techniques had altered the relationship between public-debt levels and GDP growth. In fact, Herndon demonstrated, in advanced economies average GDP growth does not dramatically change when ratios of public debt to GDP rise above 90 percent.

Herndon went on to collaborate with two UMass Amherst professors of economics, Michael Ash and Robert Pollin, on a report titled “Does High Public Debt Consistently Stifle Economic Growth? A Critique of Reinhart and Rogoff.” Published April 15, 2013, it immediately gained international attention and sparked pointed criticism of politicians and policymakers who had made the Reinhart and Rogoff study the basis of their debt-cutting fiscal plans.

Within two weeks Herndon was profiled by the New York Times, Wall Street Journal, and Washington Post, got coverage from numerous European and Canadian media outlets, and was interviewed or featured on the Bloomberg Network’s Street Smart, MSNBC’s Last Word With Lawrence O’Donnell, and Comedy Central’s Colbert Report. Stephen Colbert asked Herndon what many people might wonder, given the array of powerful people his findings have discomfited: “Do you have someone starting your car for you right now?”

Emery Berger Wins Microsoft Award for Tool That Finds Spreadsheet Errors
Emery Berger (computer science) received a 2013 Microsoft Research Software Engineering Innovation Foundation (SEIF) Award, which includes a $25,000 grant, for his work on a system to automatically find errors in spreadsheets.

Berger’s CheckCell program, one of only 16 projects selected worldwide for SEIF Awards, makes it possible for users of Microsoft Excel to find mistakes in spreadsheet data.

Because spreadsheets are widely used in businesses, Berger says, the impact of errors can be dramatic. “Errors in spreadsheet data have led to losses of millions of dollars,” says Berger. “CheckCell can automatically find mistakes like typos or other data-entry errors.”

The CheckCell system that Berger and his graduate students have devised works by examining the interaction of the data in each cell in a spreadsheet with other parts of a spreadsheet such as formulas or charts. When CheckCell finds cells that have an unusually high impact on a formula or a chart, such as making a pie wedge change dramatically in size, CheckCell marks the responsible cells in red. “The darker the red is, the ‘weirder’ the value is,” says Berger. “That means that either the value is extraordinarily important or, more likely, that it actually is a mistake.”

Berger hopes that the technology in CheckCell will eventually become a part of standard spreadsheets. “When you make a spelling or grammatical error in a word processor, you immediately get a squiggle underneath the mistake. That makes it easy to find and fix. We view CheckCell as a kind of spell-checker for spreadsheets that will help users avoid costly mistakes.”
UMass Amherst has a national reputation in clean energy, nanotechnology, computing, and engineering research, and is acknowledged increasingly for work in the life sciences. Perhaps less known but equally impressive is the campus’s national prominence in the social sciences. An unprecedented number of leading scholars have chosen UMass Amherst as home base for investigating the role of work, family, race, and gender in the formulation of national economic and public policy. This large and interdisciplinary subset of the campus’s top-ranked social science faculty is playing a major role in the latest social movements by providing information to popular media, winning national and international awards for groundbreaking research, and offering expert testimony to governing bodies around the world.

Through the Center for Research on Families and the Center for Public Policy and Administration, a core group of researchers meet regularly to discuss prevailing social issues and the best ways to address them. Sociologists, economists, regional planners, historians, psychologists, political scientists, and women, gender, sexuality experts among them, their collaborations continue to result in world-class research that stands as a resource for stakeholders across the globe.

“We’re really giving people tools to act on these issues,” says economist M. V. Lee Badgett, an international expert in matters effecting same-sex couples.

In the months and years preceding the recent overturn of the Defense of Marriage Act by the U. S. Supreme Court, Badgett’s research surrounding the societal implications of the legalization of same-sex marriage was at the forefront of the debate. During the 2010 Proposition 8 trial in California, Badgett served as a key witness. Citing data from Massachusetts and the Netherlands, she testified that the legalization of same-sex marriage would strengthen the community and boost the economy. Beyond the U.S. she has had enormous impact on same-sex rights in Australia and Vietnam.

Parents, Gender, and the ‘Motherhood Wage Penalty’

As the gender pay gap continues to be a hot topic, sociologist Michelle Budig is breaking new ground with her research showing that childless women in the United States make about 94 cents to the dollar made by their male counterparts, a gap that is exacerbated by parenthood—the average mother makes only 60 cents to the average father’s dollar, or about $1,100 a year less per child. Mothers earn less than childless women; fathers earn more than childless men. The difference is called the “motherhood wage penalty” and the “fatherhood wage bonus.”

In 2010, Budig was called to testify before the U.S. Congressional Joint Economic Committee as it attempts to mitigate the problem. Budig also worked with sociologist Joya Misra to compile their ongoing cross-national research on policies that affect mothers’ employment and wages into the Work-Family Policy Indicators—a specialized database hosted by the Luxembourg Income Study and funded by the National Science Foundation. The new database is held in high regard within the sociopolitical realm and Budig’s work is among the most highly cited within the scope of the gender pay gap. Misra’s research surrounding the gender pay gap and the cost of child care has recently been featured in the New York Times, cited in various media stories, and led to Misra’s appearance on several radio shows. As the editor of Gender & Society, the top-ranked gender studies journal, Misra has appreciated being surrounded by a great number of her successful colleagues on the UMass Amherst campus. She attributes the success of the many social scientists at UMass to their individual strengths and to the ways they work together, bringing the value of an interdisciplinary perspective to much that they do.
Psychologist Maureen Perry-Jenkins, the newly appointed director for the Center for Research on Families, has also done a great deal of research surrounding the transition into parenthood in working-class families and is one of the most highly cited work-family scholars in the world. Her research, which has been largely funded by the National Institutes of Health, is centered on the psychological well-being and emotional stability of parents and children with regard to work and responsibilities. She has found that violated expectations surrounding the division of child care are associated with increased distress after children are born, that working night shifts may be a risk factor for depressive symptoms and relationship conflict in new parents, and that shared leisure time during pregnancy and after is integral to well-functioning marriages. Her work also reveals that while lesbian couples tend to divide housework equally, biological mothers often contribute more to child care.

**Race, Nail Salons, and Tiger Moms**

Women, gender, and sexuality expert Miliann Kang has found herself in the limelight in recent months. Her book, *The Managed Hand: Race, Gender and the Body in Beauty Service Work*, has been widely praised. It employs intimate, firsthand encounters to delve into the racial and societal implications of the manicure industry, which is increasingly driven by Asian immigrants. The book has won four awards from the American Sociological Association as well as the National Women's Studies Association's Sara Whaley Book Prize. Kang's research surrounding the 'tiger mom' stereotype has also landed her lectures and talks around the country.

Sociologist and department chair Donald Tomaskovic-Devey’s recent work has turned heads as it shows that racial employment segregation has hardly budged since 1980, and is even on the rise. His research shows that although it was initially effective, affirmative action has recently had little impact on employment equality, while African Americans are more successful in workplaces that require formal credentials to make hiring decisions. With regard to employment equality, sociologist Jennifer Lundquist has also brought new information to light. Focusing on the military, Lundquist used five measurements of career satisfaction for military subjects, yielding data that shows African American women are the most satisfied with their jobs, followed by African American men, then Latinas, Latinos, and lastly, white men. Lundquist notes salaries and benefits are awarded equally and promotions are given based on standardized success and seniority, allowing for an equal playing field.

**An Award-Winning History**

Economist Nancy Folbre and sociologist Naomi Gerstel began their long careers during a time when the perceived women’s role was much narrower, yet their contributions have significantly changed the way we think about families. Folbre’s work with family economics can be found in the Economix section of the *New York Times* blog, while Gerstel continues to conduct award-winning research on marriage and family. Her articles on how marriage limits social ties to relatives, neighbors, and friends have been widely cited in the media, from the *New York Times, Boston Globe, Washington Post*, and *Chronicle of Higher Education* to the *Oprah Winfrey Show, Charlie Rose*, and *Good Morning America*.

“No other university in this country has so many work-family scholars. I feel so lucky to have ended up in a place where a lot of great people came together,” Misra says.
As we celebrated our sesquicentennial, the campus launched “Rising Researcher” — a new program to honor students whose achievements exemplify the quality of research, scholarship, and creative activity conducted by UMass Amherst undergraduates. The inaugural four are ones to watch as they build a record of success in their chosen fields.

**Breast Cancer Detective**
Ankur Sheel ’13, a double major in neuroscience and biochemistry and molecular biology, conducted his honors thesis in the lab of Larry Schwartz, UMass Amherst’s Eugene M. and Ronnie Isenberg Professor of Integrated Science and a nationally known expert in the study of cell death and human disease.

“Ankur is the best student I have worked with in over a decade, and one of the top two undergraduates I have worked with during my 25 years at UMass. I have never had a student who displayed such passion for research,” says Schwartz.

Sheel has initiated two major studies on human breast cancer to identify how a recently discovered gene, one overexpressed in the most aggressive form of breast
cancer, works within human cells. His findings will help shed light on the growth and behavior of cancerous tumors. “He is fearless about learning new methodology. These are both important studies that will result in publications, with Ankur as lead author,” says Schwartz.

Sheel plans to continue his research under Schwartz while pursuing a master’s degree in molecular and cellular biology. “The biggest benefit to working in the lab is the guidance and knowledge I receive from Professor Schwartz. I can safely say that the majority of my scientific knowledge stems from his useful feedback and his ability to explain complicated concepts in a simple manner,” says Sheel.

**Passion for Physics**

Physics major and Commonwealth Honors College student Kelly Malone ’13 has been working on research and development related to EXO (Enriched Xenon Observatory), an experiment in particle physics being conducted in Carlsbad, N.M., by an international group of academic and government scientists. Working in Professor Andrea Pocar’s lab since her sophomore year, Malone has conducted and completed three major projects, including her senior capstone project, in which she programmed the control system of a large charcoal filter that Pocar’s group is building for EXO.

Once finished, the filter will be shipped to New Mexico and installed on a leading, running experiment in neutrino physics. Its software will be the one Kelly programmed. “I consider this a major individual contribution to an experiment at the forefront of nuclear particle physics,” says Pocar. The experience is quite a feather in Malone’s cap as she moves on to pursue a doctorate in physics.

**Health Monitor**

Alexander Borges ’14 is a kinesiology major at Commonwealth Honors College. As a sophomore, he received an honors fellowship to study a consumer-wearable activity monitor. He wrote the proposal with faculty advisor Patty Freedson’s assistance and conducted the study last spring. Freedson, a leading authority on measuring physical activity’s effects on health, says that Borges’s presentation was so outstanding that his project was accepted for the School of Public Health and Health Science’s Research Day, a forum usually reserved for graduate student presentations.

Borges, whose plans include attending medical school, believes that his work with Freedson will help him be successful there. “His command of the literature in this field is superb. His accomplishments are extraordinary for a student at this stage in his academic training,” says Freedson.

**Digital Archaeologist**

Tess Brickley ’15, a Commonwealth Honors College classics major, is working with digital archaeological materials from the Pompeii Quadiporticus Project under the supervision of Professor Eric Poehler. Brickley so impressed Poehler as a first year student in his Roman archeology class that he offered her a research assistant position.

“Tess has truly excelled in every task she has been given,” says Poehler, who supported Brickley’s fieldwork this past summer in Pompeii. “One of the first was analyzing data from 74 columns in our building, the Quadiporticus at Pompeii, and discovering patterns within the hundreds of holes cut into those columns. Thinking through the process of the task I gave her was itself challenging, but her ability to visualize the results was especially impressive. I presented the results to great interest at a major international conference in January. Tess has also been instrumental in structuring thousands of photos, graphs, drawings, and database entries from the project. Most interestingly, she has mastered a photogrammetry program to reconstruct ancient spaces in 3D from simple 2D photographs.”

It was a momentous experience for Brickley. “I was excited to be able to work in Pompeii to see how the research I’ve done is physically manifested in the Quadiporticus,” she says. “This project also gives me footholds to discover my own interests in archaeology, a field in which I intend to eventually do my own research.”
Establishing a Research Agenda
The passing of the Expanded Gaming Act requires that the Massachusetts Gaming Commission establish an “annual research agenda” in order to better understand the effects of expanded gaming in the Commonwealth. Volberg and Stanek’s research will provide a neutral database, generate early-detection markers, and evaluate in-state services as the commission annually reviews progress. The new legislation also stipulates that a Gaming Policy Advisory Committee be formed to help the commission make scientifically based recommendations to the legislature and avert any problems early on. Volberg, an internationally recognized gambling researcher, provided expert testimony early in the legislative process.

“We’ve been very, very fortunate in Massachusetts. It took quite a bit of time for the legislation to develop and it was debated on a number of occasions. And I think the value to that long process is that there were members of the legislature who actually became quite informed and aware of what best practices were internationally,” Volberg says.

Stanek, Volberg, and colleague Robert Williams at the University of Lethbridge, Alberta, are co-principal investigators on the project, which includes researchers from UMass Amherst, the UMass Donahue Institute (UMDI), the University of Nevada-Reno, and Massachusetts Institute of Technology. Daniel Hodge, UMDI director of economic and public policy research, joins the principal investigators on the executive committee. The work officially started in April 2013 and is planned as a three-year project with three one-year extensions. Volberg, who has researched gambling internationally for nearly 30 years, says this kind of study has never been done before in the history of legalized gambling.

“I think we really have an opportunity to watch these
Springfield is one of two communities under consideration to host casino gambling in Western Massachusetts.

Professor Rachel Volberg, who has researched gambling internationally for nearly 30 years, says this kind of study has never been done before in the history of legalized gambling.

issues as they unfold over time, as well as an opportunity to intervene in ways that aren’t possible unless you actually have the empirical evidence,” Volberg says.

Setting a Baseline
The team has spent the first months of the study putting together a multi-modal survey that will serve as the baseline study for the research. Surveys and other primary data are being collected by National Opinion Research Center at the University of Chicago, Ipsos USA Public Affairs in Washington, D.C., and Market Street Research of Northampton.

The survey will be sent to 10,000 in-state residents using a random address-based sampling method. These interviews will provide the team crucial primary data surrounding gambling participation, any gambling problems (or associated disorders), and demographics. The data will enable the team to look for emerging patterns and shed new light on trends tracked over the years.

“Probably the most intriguing trend that we’ve noticed [is that] even when governments keep increasing the amount of gambling allowed, pretty much uniformly there’s high participation early on and then a decline,” Volberg says.

Much is in the Data
Other team members have already started collecting secondary data. Hodge and his team at UMDI—Rebecca Loveland, Lindsay Koshgarian, Carrie Bernstein, and John Gaviglio—have begun identifying and gathering statistics regarding government revenue, tourism, housing, business starts and failures, and employment. While UMDI researchers focus on the economic side of the project, Rosa Rodriguez-Monguio, Krishna Poudel, and Martha Zorn in the School of Public Health and Health Sciences (SPHHS) are looking more closely at the social impacts. The SPHHS team will collect data surrounding problem-gambling services, crime, leisure, education, socioeconomic inequality, public health, environmental issues, and quality of life. The team is also receiving secondary data from the Massachusetts Council on Compulsive Gambling. Finally, once the casinos are established, Laurie Salame of Hospitality and Tourism Management will administer employee and patron surveys.

Natasha Schull, a cultural anthropologist at MIT, is working on a pending section of the legislation that deals with casino operators sharing information about their patrons through customer-loyalty cards. That data would be valuable to the commission, so Schull is looking at how it can be shared in a way that protects patrons’ identities. Mark Nichols of the University of Nevada-Reno is playing a role on the economic impact team and is helping the social impact team study the relationship between casino gambling and crime.

Volberg has planned studies of these proportions for more than 15 years in other jurisdictions but was unable to find the necessary support. She gives Massachusetts, her home state, credit for threading research throughout the new legislation and looks forward to helping the Commonwealth make informed decisions.

“My sincere hope is that the work that we’re doing is going to maximize the benefits and minimize the costs of introducing casino gambling in Massachusetts. I think especially to minimize the negative impacts you have to know what’s going on—you have to have information and you have to have evidence. And that’s what we are planning to provide to Massachusetts and the global community,” Volberg says.
The average home or office is but one tiny unit in our greater energy grid, but given that America’s buildings rake up 75 percent of the national electric bill, energy efficiency needs to begin there. UMass Amherst computer scientist Prashant Shenoy and electrical and computer engineer David Irwin are leading a team of researchers focused on analyzing smart meters and other tools that could transform the way energy is utilized, monitored, and controlled in U.S. buildings.

The National Science Foundation funded Shenoy’s foundational smart-grid research, and now he and his team are moving into the deployment phase with several new technologies intended to help residents and utility companies achieve their energy goals. Along with partner Holyoke Gas and Electric (HG&E), Shenoy and his team are analyzing 18,000 smart meters deployed in western Massachusetts and are continuing to expand their efforts. Whereas previous meters recorded data once a month, these record electricity data constantly and feed it wirelessly to the electric utility. Because this information yields patterns—peak usage times, appliance usage, and more—it is invaluable in making buildings more efficient.

“Information is a big part of the puzzle. To make a building smarter, greener, more energy-efficient, you first need to understand its energy consumption,” says Shenoy.

In the next phase of the project that is funded by the Massachusetts Department of Energy Resources (DOER), Shenoy and the team will use a computational cluster at the Massachusetts Green High Performance Computing Center to interpret and analyze data collect-
ed by the smart meters in Holyoke. The data will feed several subprojects already underway, which include an automated thermostat, a web-based solar predictor, and an electrical reserve battery. The automated thermostat device uses building-specific data to make customized usage recommendations and implement such simple yet effective changes as automatically adjusting the thermostat when no one is home.

“Once we started collecting the data, it seemed like we didn’t have to stop there. We could do a lot more with it,” Shenoy says.

The reserve battery that Shenoy and the team are working on will help utility companies manage cold spikes and heat waves—times that often overload transformers and cause blackouts, breakdowns, and expensive repairs. The battery will sense when energy demand is low and draw off excess electricity in the grid to build a reserve. In turn, when a transformer is overburdened, the battery’s electricity will automatically release into the grid to ease the strain. Similarly, the solar energy predictor improves on existing technology to facilitate better energy management and help the grid work more efficiently. The web-based system will be synchronized with the National Weather Service and alert residents and utility companies with solar panels of an upcoming good-weather day that is likely to call for maximum energy generation. This enables users to better plan laundry loads and other high-energy activities so that they can make use of the energy locally rather than feeding it to the grid, where it is often wasted. With a 5-megawatt solar facility at its disposal—one of the largest in New England—HG&E is eager to put the planning tool into practice.

“It’s important for utilities to understand how to most efficiently utilize new technology. This is a mutually beneficial relationship,” says HG&E Project Engineer Sarah LaRose of the utility’s partnership with Shenoy and his team. Shenoy believes that his data-monitoring skills will have a positive impact in the effort for a more sustainable society. He attributes the project’s success to the regional cross-disciplinary collaboration that is putting foundational science into practice.

“It’s important for utilities to understand how to most efficiently utilize new technology. This is a mutually beneficial relationship.”

—Sarah LaRose, Holyoke Gas and Electric
A new center raises UMass Amherst’s entrepreneurial capacity

When it comes to helping entrepreneurs, James Theroux, director of UMass Amherst’s newly formed Center for Entrepreneurship (C4E), is all business. He’s building a network of successful business mentors, many of whom are alumni, and developing resources to help student entrepreneurs achieve ambitious goals.

Mentors and Ventures
Sponsored by the Isenberg School of Management, C4E was founded as a meeting place, a common ground where entrepreneurs of all levels can gather to both give and receive guidance. VentureCoach, one of the center’s foundational programs, allows students, alumni, faculty and staff to request one-on-one advice from a mentor in their field. For entrepreneurs farther along, the Mentors and Ventures Program (MVP) connects UMass startups with a network of mentors at monthly roundtable meetings. The gatherings take place in Boston, where many alumni work and live. By expanding eastward, MVP helps rising entrepreneurs “tap the rich entrepreneurial ecosystem” in the greater Boston area as well as those in their own backyard. Theroux says networking is a crucial part of the program.

“That’s the kind of thing we look for in MVP. Even if someone at MVP is not a specialist in what the entrepreneur is working on, they probably know someone who is,” he says.

New Businesses Benefit
Hundreds of emerging entrepreneurs, current students, and alumni regularly attend MVP meetings to get the feedback they need to expand their businesses. David Kozhuk’08 (finance) uses MVP to continuously clarify his business plan and practice his pitch. As the founder of uConnect, a burgeoning business devoted to helping universities develop engaging web-based career resources for students, Kozhuk says the program continues to be an important tool as he moves forward with his company. Adam O’Neill ’10 (environmental economics and entrepreneurship) consults MVP mentors regarding Broga, a company that trains yoga teachers and provides instructional material to help create a yoga experience appealing to the average male. As the company’s co-founder and CEO, O’Neill continues to use MVP to make all of the right connections. “My network has expanded rapidly, and it’s pretty important to know the right people. MVP really opened up a lot of doors,” O’Neill says.

Through VentureCoach, UMass polymer scientist Gregory Tew is utilizing C4E expertise as he brings to market his breakthrough method for permeating the T-cell membrane. Tew and his colleagues developed a protein transduction domain (PTD), a synthetic macromolecule that mimics natural ones and is capable of slipping through the previously impermeable T-cell’s membrane to deliver therapeutics. Because this “master key,” as Tew refers to it, holds obvious value, Theroux and the C4E team are helping Tew develop a business model that will bring the invention to immunologists who can put it to good use.

On the center’s website, interested students can find everything they need to start thinking like entrepreneurs—mentors, courses, and contacts. As the center continues to gather an entrepreneurial network and catalyze new course development, Theroux is determined to keep the website a valuable, up-to-date resource for UMass entrepreneurs.

Students Start Early
C4E recently helped to coordinate a new general education course for undergraduates called New Venture Creation. Targeted to sophomores, it’s intended to get students “thinking in an entrepreneurial way” early in their academic careers. Theroux, who teaches the class, centers it on developing a logical business idea, doing the relevant market research, and making the pitch. Students present their ideas several times throughout the semester and are graded on progress.

Theroux also works closely with the organizers of the UMass Innovation Challenge, a competition that has awarded more than half a million dollars to students and alumni with competing business plans. Theroux helps the contestants get the most out of the experience by working with them as they improve their final pitches. Prizewinners are then shuttled to Boston for an MVP meeting during which they are given advice from successful alumni.

With over 40 years in the field, Theroux has picked up some tricks along the way. He got his big-business start by raising $20 million in venture capital to form a cable television company that utilized then-cutting-edge wireless technology and flourished before Theroux sold it in 1991. Since then, Theroux has worked both as a professor and an investor to pass along his business skills. Adept at recognizing the underlying premises behind a business idea, he uses syllogisms to help emerging entrepreneurs refine their plans. In order for entrepreneurs to be successful, Theroux explains, they must be able to relay the simple logic behind their ideas in a way the average person can understand.

“It gives me a reason for being. That’s what our center can do: help people tell their stories,” Theroux says.
Alumni Give Back

James Theroux says C4E serves to solidify a vast network of alumni and friends eager to give back to the UMass community. Local entrepreneur Donald Todrin ’69, president of Second Wind Consultants in nearby Northampton, is one such ally. Todrin is active at the center both as an MVP mentor and as a guest lecturer in entrepreneurial courses. He brings real-life business grit to the center—a quality he hopes has a positive impact.

“My experience has actually given me some wisdom. I believe that at my age part of my role is to share that wisdom with younger entrepreneurs and business owners. I hope that the lessons I learned from what I call ‘hand-to-hand small-business combat’ will result in me preparing them to master these challenges so they can rise above them. My goal is to help them succeed,” Todrin says.

The center recently helped coordinate a new general education course for undergraduates called New Venture Creation. Directed at sophomores, it’s intended to get students thinking in an entrepreneurial way early in their academic careers.
This past year, UMass Amherst gave cross-disciplinary work in the humanities and social sciences a tremendous vote of confidence when it promoted the Interdisciplinary Seminar in the Humanities and Fine Arts (ISHA) to the status of full-fledged institute.

An Institute is Born
The recognition meant an increase in funding for the 11-year-old ISHA, now known as the Interdisciplinary Studies Institute (ISI). Committed, ongoing support from the campus has enabled the ISI to make longer-range plans for seminars, class visits, co-sponsorships, book publications, and residencies for visiting scholars such as renowned anthropologists Jean and John Comaroff. This year marked the publication of the first book based on one of the institute’s collaborative seminars, Negotiating Culture: Heritage, Ownership, and Intellectual Property, published by the University of Massachusetts Press.

To designate an institute is “a statement of commitment from an institution,” according to Vice Chancellor for Research and Engagement Mike Malone. The decision to promote ISHA to ISI benefits not only the institute but the whole university. “An institute is an important ingredient in our research portfolio,” says Malone. “In the sciences, interdisciplinary work is often forced by funding agencies, but that is much rarer in the humanities, fine arts, and social sciences.”

As an institute, the ISI will now regularly incorporate the social sciences as well as the humanities, combining various approaches from the qualitative and critical to the quantitative, according to Provost James Staros.

Themes Spur Excitement
The ISI is structured around yearlong seminars on themes as diverse as sound and sight, reproduction, other worlds, and public art, and draws faculty participants from diverse fields: communication, education, gender studies, history, Afro-American studies, anthropology, public policy, art, and English, to name just a few. The 2013-14 seminar topic is “Emancipation,” to celebrate the 150th anniversary of the Emancipation Proclamation.

Shona Macdonald, associate professor of art, architecture, and art history and one of this year’s faculty fellows, is enthused about exploring the ideas of emancipation and autonomy, “especially in light of the recent NSA blowups and what this means for everyday Americans’ freedom. The conversations and presentations in the ISI seminar are deeply thought-provoking.”

Themes for each year’s seminar are suggested by faculty in the ISI community and chosen by the ISI board. Faculty fellows who participate receive a research stipend for the year. Each presents a talk at the institute’s biweekly luncheon.

“The ISI is a nexus for creativity,” says ISI Director Stephen Clingman, a professor of English who specializes in postcolonial and transnational fiction as well as South African literature. “The institute provides a creative environment for cross-disciplinary work.”

Interdisciplinary Adventures
Banu Subramaniam, associate professor in women, gender, and sexuality studies, has participated in four ISHA seminars and so benefited from the experience that she is now on the ISI board. “I was trained as a biologist but teach in women’s studies, so I think interdisciplinarily,” says Subramaniam. “The seminars all have interesting themes and are broad enough that people around campus can see the connections in what they do. Your discipline shapes how you see the world and what kind of questions you ask. Sometimes someone in a seminar says something that opens your mind to see your own project in a whole new way.” She cites her participation in the “Migrations” seminar as an example: while Subramaniam studies how DNA reflects patterns of human migration, her fellow participant,
linguist John Kingston, revealed how the spread of language tells a slightly different story. “We use different variables, histories, and even methods of questioning,” says Subramaniam. “It was such a rich conversation that led to the larger question of how we know anything.”

Professor of History David Glassberg, another repeat faculty fellow, finds the seminars intellectually refreshing. A specialist in place memory and climate change, Glassberg attests that the seminars are good for jostling knowledge that faculty members can start to take for granted. “The exchanges can be what I would call ‘fruitfully awkward,’ when you realize that certain terms, like ‘complexity’ or ‘elegance,’ can have different meanings in different disciplines,” Glassberg laughs. “Part of the fun is seeing if the ways we use them are totally unrelated or are fundamentally connected at a deep level.”

Jon Machta, a professor of physics, saw the potential in the “Transformations” seminar: “My field is statistical physics, and I’ve given a lot of thought to how does one define complexity and how transformations lead to greater complexity. I appreciated the unique opportunity to present ideas from my own field to an audience with very different intellectual backgrounds. Preparing my talk stimulated me to think deeply about the core ideas in my field.” Describing himself as the “furthest removed from the center mass” of the other participants’ work, Machta had to become more aware of how to convey his ideas to a non-technical audience not necessarily versed in formulae. That experience, Machta says, helped him become more aware of how he presented his findings in general, “even to technical people.” Stimulated and broadened by his ISHA experience, he is currently collaborating on an interdisciplinary project with an ecologist at University of California Davis.

Malone says the measure of the ISI’s success will be how it meets its own goals over a five-year period. He acknowledges that the goals will evolve as the institute itself evolves and thrives. Clingman’s infectious optimism and his resolve to keep the seminars topical, relevant, and responsive to current events seem to guarantee a bright future for the ISI.
A MEETING OF MINDS

Hluchyj Fellows combine nursing and engineering to improve clinical health care

True, lasting change requires a meeting of the minds—a moment of mutual inspiration that occurs when people who think differently from one another start thinking together. Theresa and Michael Hluchyj know this well. The campus alums have endowed a UMass Amherst fellowship that provides $25,000 annually to two graduate students, one in nursing and one in engineering, as they conduct research in clinical healthcare.

Michael ’79 (engineering) and his wife, Theresa ’77 (nursing), are passionate about their alma mater. Both have enjoyed successful careers and wanted to give back to the campus in a way that enabled collaborative research in their disciplines and tackled “real problems in the clinical setting.” The Hluchyjs founded the fellowship in 2008 and have since seen the positive impact their generous gift has had on campus and in the clinical setting.

Solving Problems, Advancing Care

Akshaya Shanmugam (electrical and computer engineering) and Jalil Johnson (nursing) were awarded the 2012–13 fellowships. Shanmugam is working with faculty advisor Christopher Salthouse (electrical and computer engineering) and mentor Donna Zucker (nursing) to develop a device that will help Zucker more efficiently test in the field for Hepatitis C virus (HCV). Zucker regularly visits the Hampshire County Jail and the Center for Education Prevention and Action (CEPA) in nearby Holyoke to provide free HCV screening. Current testing methods require Zucker to send samples to a state lab and wait as many as four weeks for results.

“When you are dealing with a highly sensitive population or with a population that is difficult to get a hold of, this whole procedure makes things very complicated,” Shanmugam explains.

The microfluidic device that Shanmugam is designing will provide immediate results, determining if a patient is positive or negative for HCV. It will also detect the appropriate subtype if the patient tests positive—an important factor as subtype dictates how the patient must be treated. Shanmugam has received approval from the campus’s Institutional Review Board (IRB) and is moving into the next phase of the project. As she develops a working model, she is joining Zucker on her trips to CEPA to observe the screening process. This is Shanmugam’s first experience with biological engineering and she is excited to observe the relative human factors firsthand.

“This collaboration has helped me make that transition and to look at the other side of the problem,” Shanmugam says.

Johnson, who works as a nurse practitioner for Baystate Health Systems, is focusing on technology that can help Puerto Rican diabetes patients improve their self-care. He is working with devices that will provide instantaneous measurements of glucose levels and blood pressure to a nurse in the outpatient setting. Additionally, this system uses an automated pillbox that records when patients take (or do not take) their medicine. The devices alert the patient’s nurse, and if very high or very low biomarkers are detected, the nurse or medical provider intervenes.
as appropriate. The automated pillbox also allows for a nurse to monitor a patient’s medication adherence remotely and intervene if needed. As Johnson develops this technology, he is collaborating with UMass Amherst mechanical and industrial engineer Jenna Marquard and Garry Welch, a psychologist at Baystate who specializes in behavioral intervention.

“The fellowship has allowed me to focus on my research and enabled me to seek out interdisciplinary partners,” Johnson says.

Former Fellows Embody Success
Kavita Radhakrishnan, one of the first Hluchyj fellows, is a shining example of the fellowship’s success. Radhakrishnan accepted a faculty appointment at the University of Texas School of Nursing after completing a prestigious post-doctoral position at the University of Pennsylvania. A UMass Amherst doctoral student in nursing, she had a background in telehealth engineering, the use of electronic information and telecommunications technologies to support the delivery of remote clinical healthcare and other health-related services.

During her fellowship, Radhakrishnan was part of a team that evaluated the usability of two consumer health informatics platforms that could impact several medical populations, including diabetics, post-bariatric surgery patients, and cardiac patients. Her work at UMass led her to Penn, where she studied patient-level data to inform prioritization of homecare interventions for heart failure patients using remote-monitoring technologies.

“She’s really good at using telehealth to focus on the usability, the adaptability, the interface with the patient, the interface with the nurse and making it successful. She studies the human factor of telehealth technology,” says Joan Roche, Radhakrishnan’s former nursing professor and advisor at UMass.

The marriage of the two fields is inspired: health care professionals provide an insider perspective, while engineers offer a fresh outlook and technical expertise. And seeing their collaboration have lasting impacts on real patients has made the experience all the more memorable. “Most of the time when you work on something, you don’t even know what it’s doing out in the field, but seeing it right away is an amazing feeling,” says Shanmugam.
2013 HIGHLIGHTS

Geckskin™ Makes Top Innovation Lists
CNN has named Geckskin, the super-strong adhesive developed at UMass Amherst by an interdisciplinary team of scientists, was one of the top five science breakthroughs of 2012, and Bloomberg News listed it among “14 Smart Inventions Inspired by Nature” in 2013.

Created by Professor of Polymer Science and Engineering Alfred Crosby, Professor of Biology Duncan Irschick, and doctoral candidate Michael Bartlett, Geckskin exhibits such an adherent strength that a strip the size of an index card can support up to 700 pounds.

Both designations focus on the Geckskin project as a herald of biomimetic design—innovation that takes its inspiration from structures in nature. CNN listed Geckskin—alongside gene therapy, a one-carbon-atom sheet that could eventually replace rare-earth metals, “augmented reality” smart-phone applications, and re-visioned automobile drivetrains—as an innovation with great potential impact on the business world.

Geckskin, the development of which was funded partially by the U.S. Defense Research Projects Agency, is an example of a key UMass Amherst priority: sponsored research that leads to discoveries that will have applications in the world outside of the academy.

UMass Amherst Researchers Discover How Cellulose Chains Break Down
One might assume that scientists had long ago cracked the secret of cellulose, Earth’s most abundant polymer, in order to break its chemical bonds and harness its abundant energy. But only recently have theoretical chemist Scott Auerbach and his UMass Amherst colleagues discovered how cellulose chains break down with heat—critical knowledge for efficiently converting cellulose to biofuels.

Reporting in the Journal of the American Chemical Society, Auerbach, chemical engineer Paul Dauenhauer, and others for the first time modeled at the molecular level the activation energies needed for the chemical reaction known as “fast pyrolysis” to proceed in cellulose. “Given this new knowledge, we can begin to build a picture for how cellulose depolymerizes, and how it can be done better and more efficiently,” says Auerbach. He and Dauenhauer are applying these new insights to find more efficient ways to make biofuels from cellulose.

UMass Scientists Win $2M NSF Grant to Develop Self-folding Polymer Sheets for New Materials
A group of UMass Amherst scientists and mathematicians led by physicist Christian Santangelo won a National Science Foundation (NSF) Emerging Frontiers in Research and Innovation (EFRI) grant for 2012, one of only 15 given to investigators at 26 institutions and totaling nearly $30 million.

Santangelo and his colleagues, including polymer scientist Ryan Hayward, are experts in developing self-folding polymer sheets, which take advantage of origami principles to provide highly tunable mechanical responses. Their four-year, $2-million grant is part of EFRI’s Origami Design for the Integration of Self-assembling Systems for Engineering Innovation program for developing new mechanical meta-materials.

UMass Amherst Chemist Brings Low-Cost Drinking Water Test Strips to Pakistan
The National Academy of Sciences has announced a three-year, $271,930 grant that will enable UMass Amherst chemist Vincent Rotello to join with researchers at Lahore University of Management Sciences (LUMS), Pakistan, in developing, testing, and deploying sensitive, reliable, and affordable inkjet-printed, nanoparticle-based test strips for detecting disease-causing bacteria in drinking water.

Rotello and colleagues at the LUMS School of Science & Engineering will address drinking water safety in the city Pakistani city of Lahore, where it is estimated that more than 60 percent of water sources are contami-
nated with disease-causing bacteria; rates in rural areas are even higher. Rotello’s project was one of only 10 chosen from among 268 nationwide, with NAS managers praising it as being “among the strongest in the excellent group of proposals we received.”

**College of Education Secures $21M for Education and Training in Post-Conflict Countries**

David Evans, professor in the Department of Educational Policy, Research, and Administration and director of the College of Education’s Center for International Education, and Joseph B. Berger, associate dean for research and engagement, are internationally recognized as experts in developing collaborations and partnerships with post-conflict countries, particularly Afghanistan and Gaza, seeking to reinvent their teacher training and education systems. Their projects in Afghanistan have been funded by more than $21 million in USAID grants in the past two years.

**UMass Amherst Scientist Advises Department of Defense on Green Buildings**

New recommendations by a National Research Council (NRC) expert panel on green and sustainable building performance could lead to a revolution in building science by creating the first large building-performance database, says panel member Paul Fisette, a nationally recognized sustainable-building expert at UMass Amherst.

Fisette and six other NRC panel members were asked to consider whether nearly 500,000 structures owned by the U.S. Department of Defense (DOD) worldwide are being operated as sustainably and efficiently as possible, according to a number of national green building standards. The panel recently completed their nine-month assessment of energy efficiency, water use, and other sustainability factors at about 300,000 DOD facilities. One of their top recommendations: that the department start metering such variables as energy and water use in order to collect information on how different facilities perform in different environments.

**Researchers Improve Immunization Strategies for Dengue Fever in Thailand**

Using a unique data set tracking 40 years of dengue fever incidence in Thailand, an international team led by UMass Amherst biostatistician Nicholas Reich has for the first time estimated that persons exposed to an initial dengue infection are thereafter protected from infection by other strains for between one and three years. This finding has implications for the design of more effective vaccine studies, say Reich and colleagues at the Johns Hopkins Bloomberg School of Public Health, the University of Michigan, and the Armed Forces Research Institute of Medical Sciences in Bangkok.

Reich, an expert in the statistical modeling of infectious disease data, and the team worked with the Thai health ministry under a five-year, $2.5-million grant from the National Institute of Allergy and Infectious Diseases to help Thailand’s Ministry of Health study patterns of dengue fever. Part of their goal was to create a tool to help them predict the timing and spread of dengue outbreaks in Thailand in order to help the Health Ministry understand how to allocate their resources effectively.

Dengue fever is a mosquito-transmitted viral infection that poses life-threatening health risks to humans. It sickens 5 percent of the world’s population each year and recently has begun to emerge in parts of the southeast United States.

**Chemical Engineers Discover ‘Ultraselective’ Process to Make Valuable Chemical from Biomass**

Chemical engineering researchers Wei Fan and Paul Dauenhauer and their UMass Amherst colleagues have discovered a chemical process to make p-xylene, an important ingredient of common plastics, at 90 percent yield from lignocellulosic biomass, the highest yield achieved to date.

As Dauenhauer explains, the chemical industry currently produces p-xylene from more expensive petroleum, while the new process will make the same chemical from lower-cost, renewable biomass. He and colleagues call the process “ultraselective” because of its ability to achieve 90 percent selectivity for the desired product. “The biomass-derived p-xylene can be mixed with petroleum-based plastics, and consumers will not be able to tell the difference. But manufacturers and chemical companies will be able to operate more sustainably and at lower cost because of this discovery,” he adds.

**In Raising Adopted Children, How Parents Work Together is More Important than Their Sexual Orientation**

A new study by psychology researchers suggests that whether parents are gay, lesbian, or straight, how well they work together as a couple and support each other in parenting is linked to fewer behavioral problems among their adopted children and is more important than their sexual orientation.

Rachel H. Farr at UMass Amherst and Charlotte J. Patterson at the University of Virginia have reported their findings from this first empiri-
Student Spin-off Crowd Solar Making it in Massachusetts Competitions

Bachelor’s candidate Patrick Holmes (environmental science & earth systems) and alumni team members Chris Bent ’12 (marketing) and Justin Timlin ’12 (sport management) have formed Crowd Solar, an online platform that facilitates investment in local solar projects for community buildings. Crowd Solar took home a $10K prize in the 2013 UMass Innovation Challenge, and was a semifinalist in both the Northeast Regional CleanTech Open and was a semifinalist in both the 2013 UMass Innovation Challenge, and was a semifinalist in both the Northeast Regional CleanTech Open and the Mass Challenge Business Accelerator program.

Biologists Reveal Structure of Human Enzyme, Offering Hope to Children with Rare Metabolic Disorders

Considered separately, inherited metabolic disorders such as Tay-Sachs disease and mucopolysaccharidosis 4A (MPS 4A) are exceedingly rare, complex, and difficult to study. Considered as a group, however, the more than 50 lysosomal storage diseases become more common—they affect approximately 1 in 7,000 births—and lessons learned about any one of them can be applied to the others.

Now a team of structural biologists led by Scott Garman has moved the field forward by revealing the structure of human galactosamine-6-sulfatase (GALNS), the lysosomal enzyme that is defective in patients with MPS 4A. Garman’s group previously determined the structures of the enzymes that lead to Fabry and Schindler/Kanzaki diseases.

UMass Amherst, National Team Define Limits of Microbial Life in an Undersea Volcano

By some estimates, a third of Earth’s organisms live in our planet’s rocks and sediments, yet their lives and ecology are almost a complete mystery. Microbiologist James Holden at UMass Amherst and others have reported in Proceedings of the National Academy of Sciences the first detailed data about a group of methane-exhaling microbes that live deep in the cracks of hot undersea volcanoes. Studying these “methanogens” could shed light on terrestrial natural gas formation.

“For the first time we’re studying these subsurface microorganisms, defining their habitat requirements, and determining how those differ among species. It’s very exciting and will advance our understanding of biogeochemical cycles in the deep ocean,” says Holden. The study also addresses such questions as what metabolic processes may have looked like on Earth three billion years ago, and what alien microbial life might look like on other planets.

Second Skin: Polymer Scientists Play Pivotal “Roll” in Smart Suit of the Future

Military uniforms of the future may offer a new layer of critical protection to wearers, thanks to research by teams at UMass Amherst and several other institutions that are developing a nanotube-based fabric that repels chemical and biological agents.

Polymer scientists Kenneth Carter and James Watkins, collaborating with researchers at Lawrence Livermore National Laboratory, received a five-year, $1.8-million grant to design ways to manufacture the new material as part of a $13-million project funded by the U.S. Defense Threat Reduction Agency. It’s estimated that the new uniforms could be deployed in the field in less than 10 years.

The researchers say the fabric will be able to switch reversibly and without the need for an external control system from a highly breathable state to a protective one in response to an environmental threat. Carter and Watkins bring to the project expertise in additive-driven assembly processes that bring polymers and nanoparticles together to produce hybrid functional materials. Membrane and layer fabrication will take place in part through the university’s Center for Hierarchical Manufacturing (CHM) Roll-to-Roll Nanofabrication Laboratory. CHM is a national Nanoscale Science and Engineering Center (NSEC) and is funded by $36 million from the National Science Foundation.

In the fight against cancer, knowing the enemy’s exact identity is crucial for diagnosis and treatment, especially in metastatic cancers, those that spread between organs and tissues. Now chemists led by Vincent Rotello at UMass Amherst have developed a rapid, sensitive way to detect microscopic levels of many different metastatic cell types in living tissue.

Rotello’s team uses a sensor array system of gold nanoparticles and proteins to “smell” different cancer types in much the same way that our noses identify and remember different odors. The new work builds on the team’s earlier devel-
Development of a “chemical nose” array of nanoparticles and polymers that are able to differentiate between normal cells and cancerous ones. Rotello explains, “With this tool, we can now actually detect and identify metastasized tumor cells in living animal tissue rapidly and effectively. We were the first group to use this approach in cells, which is relatively straightforward. Now we’ve done it in tissues and organs, which are very much more complex. This advance brings us much closer to the promise of a general diagnostic test.”

Ice-Free Arctic May be in Our Future
Analysises of the longest sediment core ever collected on land in the arctic, recently completed by an international team led by UMass Amherst geoscientist Julie Brigham-Grette, provide “absolutely new knowledge” of arctic climate from 2.2 to 3.6 million years ago and show that with estimated atmospheric carbon dioxide similar to today’s levels, the arctic was very warm, with no ice sheets.

“While existing geologic records from the arctic contain important hints about this time period, what we are presenting is the most continuous archive of information about past climate change from the entire arctic borderlands. We can go back in time and reconstruct how the arctic evolved with only a few pages missing here and there,” says Brigham-Grette. Results of analyses provide “an exceptional window into environmental dynamics” never before possible.

DOE Awards UMass $1.25M for Speech Language Pathology Project
Mary Andrianopoulos (communication disorders) and Mary Lynn Boscardin, chair of the Student Development Department, received a five-year, $1.25-million grant from the U.S. Department of Education for training speech language pathologists in the public schools to effectively deliver reliable, evidence-based models of technology. Theirs was one of only nine winning proposals in the national competition.

The grant supports over 40 master’s students in speech language pathology with a specialization in autism spectrum disorders and using technologies to facilitate learning. Their research-to-practice activities will include studying the efficacy of various intervention approaches typically delivered to children on the autism spectrum.

UMass Amherst Hearing Scientist Receives $1.3 Million to Study Hearing and Aging
Hearing scientist Karen Helfer has received a five-year, $1.3-million grant from the NIH’s National Institute for Deafness and Other Communication Disorders to conduct a series of studies to determine what goes on in difficult listening situations where hearing aids often don’t help, and to explore ways to help millions of older Americans hear better. Though most people with hearing loss are treated with hearing aids, the devices are not very helpful in situations where many people are talking at once or there is background noise, says Helfer, an expert in aging and speech communication. More than 13 million Americans over 65 have hearing loss, she notes, and that number is expected to exceed 27 million by 2030. “This is definitely a quality-of-life issue. There are really strong links between hearing loss and social isolation and other negative consequences,” says Helfer.

Researchers Develop Powerful Technique to Study Protein Function
UMass Amherst neurobiologist Dan Chase and his colleagues have developed an experimental technique that allows scientists to study the function of individual proteins in individual cell types in a living organism. The advance should help provide deeper insights into protein function by facilitating a true understanding of what a single protein does when its function can be isolated in a living organism. Chase and his team have already used the technique to tease apart some of the mechanisms of dopamine signaling. “The strategy can be adapted to study the function of any protein involved in any biological process,” Chase says.
C. Marjorie Aelion, dean of the School of Public Health and Health Sciences, was elected to the Association of Schools of Public Health’s board of directors and to serve as secretary/treasurer for a two-year term.

Jane A. Baran (communication disorders) received the 2013 Editor’s Award from the Journal of the American Academy of Audiology.

Raymond Bradley, distinguished professor of geosciences and director of the Climate System Research Center, received an honorary doctor of science degree from Ontario’s Queens College. Bradley was described as “a celebrated global warming whistleblower known for championing integrity in science” and was joined by another American, actress Glenn Close, in receiving an honorary degree from the college.

Professor Laura Briggs, chair of the Women, Gender, Sexuality Studies Department, has been awarded the James A. Rawley Prize, given annually by the Organization of American Historians to the author of the year’s best book on the history of race relations in the United States. Briggs’s Somebody’s Children: The Politics of Transracial and Transnational Adoption was published by Duke University Press.

Alejandro L. Briseño received the Presidential Early Career Award for Scientists and Engineers, the highest honor bestowed by the federal government on science and engineering professionals in the early stages of their independent research careers.

Astronomer Daniela Calzetti was named the 2013 Blaauw Professor at the University of Groningen’s Kapteyn Astronomical Institute in The Netherlands. She was recognized for her “excellence in research, broad knowledge of astronomy, and outstanding international status in astronomy.”

Julie Caswell, professor of resource economics, was elected president of the Agricultural and Applied Economics Association.

Sociology professors Dan Clawson and Naomi Gerstel are 2013–14 Russell Sage Foundation Visiting Scholars.

Professor John Collura (civil and environmental engineering), the director of the UMass Amherst Transportation Center, was awarded the American Road and Transportation Builders Association’s S. S. Steinberg Award, which recognizes individuals who have made remarkable contributions to transportation education.

Paul Dauenhauer, assistant professor of chemical engineering, was one of only 14 scientists worldwide recognized with a 2013 Du Pont Young Professors Award. The award comes with $75,000 in unrestricted funding for three years, which Dauenhauer will use to pursue his research on economically turning biomass into plastics and chemicals.

Professor Richard S. Ellis (mathematics and statistics) received the Silver Medal in Living Now Book Award from the Florida Publishers Association for his Blinding Pain, Simple Truth: Changing your Life Through Buddhist Meditation.

Hari Balasubramanian (mechanical and industrial engineering), Paul Dauenhauer (chemical engineering), Matthew Holden (chemistry), David Irwin (electrical engineering), and Qiangfe Xia (electrical and computer engineering) have been awarded the 2013 CAREER Award by the National Science Foundation. The organization’s most prestigious awards, CAREER grants support junior faculty who exemplify the role of the teacher-scholar through outstanding research, excellent teaching, and the integration of education and research within the context of their organization’s mission.

Professor David Fleming (English) was awarded the 32nd Mina P. Shaughnessy Prize in English from the Modern Language Association of America for his book From Form to Meaning: Freshman Composition and the Long Sixties, 1957–1974, published by the University of Pittsburgh Press. The award recognizes outstanding work on language, culture, literature, or literacy and having a strong application to the teaching of English.

Jane Fountain (political science) was named a fellow of the National Academy of Public Administration and appointed to Governor Deval Patrick’s Innovation Council.

Professor Lixin Gao (electrical and computer engineering) has been selected as a Fellow of the Association of Computing Machinery “for contributions to network protocols and internet routing.”
Lynnette Leidy Sievert (anthropology) was named editor-in-chief of the American Journal of Human Biology.

Lauren McCarthy, assistant professor of political science, received a 2013 Kennan Institute Fellowship and the 2012 Edwin S. Corwin Award from the American Political Science Association for the best dissertation in the field of public law.

Kathryn A. McDermott and Sonia Nieto (education) were named to the American Enterprise Institute’s Frederick M. Hess Edu-Scholar Public Presence Rankings for their contributions to the national public dialogue on education policy.

Léonce Ndikumana, Andrew Glyn Professor of Economics, was appointed to U.N.’s Committee for Development Policy for 2013–15.

Max Page, professor of architecture and history, was one of three scholars nationally named to receive the Rome Prize for Historic Preservation and Conservation, awarded annually by the American Academy in Rome to honor “the highest standard of excellence in the arts and humanities.”

Bill Patterson, professor emeritus environmental conservation, received the 2012 Herbert Stoddard Lifetime Achievement Award from the Association for Fire Ecology for significant contributions to our understanding of fire ecology and fire management in the eastern and southern U.S.

Shelly Peyton, assistant professor in chemical engineering, has been named a Pew Scholar in the Biomedical Sciences by The Pew Charitable Trusts. Recipients receive $240,000 over four years to pursue their projects without restriction. Peyton investigates how stem cells contribute to the metastatic spread of breast cancer.

Professor Stephen R. Platt (history) was awarded the McGill University’s 2012 Cundill Prize in History for his book Autumn in the Heavenly Kingdom. The Cundill Prize has been called “the world’s richest and most prestigious award for historical literature.”
Professor Robert Pollin (economics) was presented with the Los Angeles Alliance for a New Economy’s 2012 City of Justice Award, which recognizes the nation’s leading progressive voices and celebrates a bold, common vision of a new economy for all.

Neuroscientist Luke Remage-Healey received the 2012 Frank A. Beach Award from the Society for Behavioral Neuroendocrinology for work in behavioral neuroendocrinology showing exceptional promise and significant contributions.

Biophysicist Jenny Ross has won one of the top national honors in her field, the 2013 Margaret Oakley Dayhoff Award, from the Biophysical Society of Rockville, Md. It is given to a woman who has achieved prominence for “substantial contributions to science” while showing high promise for ideas and leadership in the early stages of her biophysical research career.

H. Dennis P. Ryan, professor of environmental conservation and coordinator of the Arboriculture and Community Forestry Program in the Stockbridge School of Agriculture, received the International Society of Arboriculture’s Award of Merit.

Professors Maria Santore (polymer science and engineering) and Danny Schnell (biochemistry and molecular biology) were elected fellows of the American Society for the Advancement of Science.

Associate Professor Amy Schalet (sociology and labor studies) received the Carol Mendez Cassell Award for Excellence in Sexuality Education and the American Sociological Association Section on Youth and Children Distinguished Scholarly Research Award.

Charles Schweik, associate professor of environmental conservation and public policy, was one of three senior scholars worldwide to receive a new award honoring the late political economist Elinor Ostrom, the only woman to date to win the Nobel Memorial Prize in Economic Sciences. Schweik was also named one of this year’s top 50 innovators in education by the Center for Digital Education, a national research and advisory institute specializing in education technology trends, policy, and funding.

Brian Umberger, associate professor of kinesiology, has been elected to a two-year term on the executive board of the America Society of Biomechanics.

Professor Jim Watkins (polymer science and engineering) was elected a 2012 American Physical Society Fellow by the Division of Polymer Physics for his pioneering efforts in manipulating polymers to develop technologically functional nanoscopic materials.

Beverly Woolf (computer science) was recognized by the White House as an Innovation Fellow for her pioneering work in educational software systems.

Assistant Professor Qiangfei Xia (electrical and computer engineering) received a Young Faculty Award from the Defense Advanced Research Projects Agency.

Baoshan Xing, professor of environmental and soil chemistry, was elected a fellow of the Soil Science Society of America and the American Society of Agronomy.
SPONSORED ACTIVITY

Fiscal Year 2013 Sponsored Research

Proposals Submitted: 1,400
Proposal Dollars: $533.7 million
Awards: 1,043
Award Dollars: $148.9 million
Research and Development Expenditures: $194.8 million*

Access the campus’s full sponsored activities report at: www.umass.edu/research

FY 2004-2013: Award Dollars - Three-Year Rolling Averages **

FY 2013: Distribution of Awarded Dollars by Sponsor Category

$148,879,759

FY 2013: Distribution of Award Dollars from the Private Sector

$31,094,207

FY 2013: Distribution of Award Dollars from Federal Agencies

$102,443,337

* R&D expenditures reflect FY 2012, the most recent available numbers as reported by the UMass President’s Office 2012 Report on Annual Indicators University Performance Measurement System.

** FY 2010 includes ARRA stimulus funds.
LICENCES AND PRODUCT DEVELOPMENT

CEM Corp. Licenses Carpino Technology for Peptide Synthesis
CEM Corporation (North Carolina) has licensed technology developed by Professor Louis Carpino. Carpino and his group developed a series of amino group protecting compounds useful in facilitating peptide synthesis. According to Mike Collins, CEO and president of CEM Corporation, Carpino has been a pioneer in this field for many years and developed the Fmoc protecting group, the industry standard for the past 25 years. The company believes that these new compounds have substantial advantages over Fmoc chemistry and will ultimately become the new standard for facilitating peptide synthesis.

CEM Corporation is a leading global company specializing in scientific solutions for critical laboratory applications. It designs and manufactures products used in many industries including pharmaceutical, biotech, chemical, and food processing, as well as in academic research.

LidoChem Inc. Uses Gunner Technology for Crop Disease Protection
UMass Amherst licensee LidoChem Inc. has introduced a product based on a fungus-fighting bacterium with fungicide and fungistatic activity for control of plant diseases, pathogenic nematode suppression, and environmental remediation. It will be available nationally by the spring of 2014. The bacterium was discovered and developed by Haim Gunner, UMass Amherst emeritus professor of environmental science. The product will be used in pre-treating soybean, corn, and other crop seeds, and for in-season soil applications as part of an ecosystem management approach to plant health and disease protection. LidoChem is a New Jersey-based company offering through its Performance Nutrition Division innovative “green” products and programs for crop and turf fertility and pest control.

UMASS STARTUPS

Qteros
UMass Amherst entered into a license agreement with Sunverta, LLC, now renamed Qteros. The license covers clostridium phytofermentans technology developed by Susan Leschine and colleagues. Qteros (Amherst, Mass.) is headed by Steve Rogers, an entrepreneur who was formerly chief operating officer and founder of the original Qteros, which ceased operations in 2012.

OCL
UMass Amherst completed an agreement with OCL, a startup formed by colleagues of the late Herb Hultin, UMass Amherst’s noted food science professor. The agreement covers technology for improving tenderness and extending shelf life in protein food products.

Felsuma
Felsuma, incorporated to develop and commercialize the Geckskin™ dry-adhesive device developed by Al Crosby (polymer science), Duncan Irschick (biology), and others, entered into an option agreement with UMass Amherst. Felsuma is in discussion with several potential multinational customers and hopes to begin producing prototypes later this year.

TECHNOLOGY TRANSFER

FY 2013 BY THE NUMBERS

51 Invention Disclosures received
32 Patent Applications filed
24 Patents issued
21 License and Option Agreements executed
1.2M Revenue received
## PATENTS ISSUED IN 2013

<table>
<thead>
<tr>
<th>Lead Inventor</th>
<th>Patent No</th>
<th>Title</th>
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<tbody>
<tr>
<td><strong>CHEMICAL ENGINEERING</strong></td>
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<tr>
<td>George Huber</td>
<td>USP 8,277,643</td>
<td>“Catalytic Pyrolysis of Solid Biomass and related Biofuels, Aromatic, and Olefin Compounds”</td>
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<td><strong>CHEMISTRY</strong></td>
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<tr>
<td>Louis A. Carpino</td>
<td>USP 8,217,169</td>
<td>“Coupling Agents for Peptide Synthesis”</td>
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<td>USP 8,471,006</td>
<td>“New Coupling Agents for Peptide Synthesis”</td>
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<tr>
<td>Sankaran Thayumanavan</td>
<td>USP 8,420,121</td>
<td>“Drug Delivery Vehicles, Methods of Manufacture, and Methods of Use Therof”</td>
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<tr>
<td>Robert M. Weis</td>
<td>USP 8,268,965</td>
<td>“Template-Directed Assembly of Receptor Signaling Complexes”</td>
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<td><strong>ELECTRICAL &amp; COMPUTER ENGINEERING</strong></td>
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<tr>
<td>Steven S. Holland, Marinos Vouvakis</td>
<td>USP 8,325,093</td>
<td>“Planar Ultra-Wideband Modular Array”</td>
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<tr>
<td>Ramakrishna Janaswam</td>
<td>USP 8,299,964</td>
<td>“System and Method for Adaptive Correction to Phased Array Antenna Array Coefficients through Dithering and Near-field Sensing”</td>
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<tr>
<td>Daniel Schaubert</td>
<td>USP 8,466,845</td>
<td>“Wide Bandwidth Balanced Antipodal Vivaldi Antenna and Array including a Magnetic Slot”</td>
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<td><strong>MICROBIOLOGY</strong></td>
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<td>Derek R. Lovley</td>
<td>USP 8,277,657</td>
<td>“Systems and Methods for Microbial Reductive Dechlorination of Environmental Contaminants”</td>
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<td>Derek R. Lovley, Kelly Nevin</td>
<td>USP 8,283,076</td>
<td>“Microbial Fuel Cells”</td>
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<td><strong>PLANT, SOIL &amp; INSECT SCIENCES</strong></td>
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<td>Om Parkash</td>
<td>USP 8,329,987</td>
<td>“Metal Resistance Plant Genes, Metal Resistant Plants, and Methods of Manufacture Therof”</td>
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<td><strong>POLYMER SCIENCE &amp; ENGINEERING</strong></td>
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<td>E. Bryan Coughlin</td>
<td>USP 8,263,709</td>
<td>“Crystal Nucleating Agents, Crystalline Polymer Composition, Methods of Manufacture Therof, and Articles Therof”</td>
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<tr>
<td>250155 (Canada)</td>
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<td>“Cross-Linked Polycyclooctene”</td>
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<td>Todd S. Emrick, E. Bryan Coughlin and Richard Farris (posthumous)</td>
<td>USP 8,314,202</td>
<td>“Anti-flammable Deoxybenzoin-Substituted Polyolefins and Related Methods of Use”</td>
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<td>Alfred J. Crosby</td>
<td>USP 8,321,139</td>
<td>“Methods and Apparatus for Modulus Measurement”</td>
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<tr>
<td>Alan J. Lesser</td>
<td>USP 8,227,551</td>
<td>“Polymeric Compositions, Methods of Manufacture Therof and Articles Comprising the Same”</td>
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<td>Alan J. Lesser, Thomas J. McCarthy</td>
<td>USP 8,455,096</td>
<td>“Reinforced Polymeric Materials, Method of Manufacture Therof and Articles Comprising the Same”</td>
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<tr>
<td>Thomas P. Russell ’74BS, ’76MS, ’79PhD</td>
<td>USP 8,211,737</td>
<td>“Method of Producing Nanopatterned Articles, and Articles Produced Thereby”</td>
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<td>USP 8,247,033</td>
<td>“Self-assembly of Block Copolymers on Topographically Patterned Polymeric Substrates”</td>
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<td>USP 8,361,337</td>
<td>“Method of Producing Nanopatterned Templates”</td>
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<td>Maria Santore, Vincent Rotello</td>
<td>USP 8,382,858</td>
<td>“Nanoparticle Textured Surfaces and Related Methods for Selective Adhesion, Sensing and Separation”</td>
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<td>Gregory N. Tew</td>
<td>USP 8,329,927</td>
<td>“Water-Soluble and Water-Insoluble, Ring Opening Metathesis Polymerization Products, Monomers, and Related Methods”</td>
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<td>USP 8,431,406</td>
<td>“Terpyridine-Substituted Compounds and Related Selective Detection Methods”</td>
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<td>USP 8,445,611</td>
<td>“Antimicrobial Polymers”</td>
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<td><strong>VETERINARY &amp; ANIMAL SCIENCES</strong></td>
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<tr>
<td>James Robl</td>
<td>USP 8,273,571</td>
<td>“Pluripotent Cells Containing either All Female or All Male-derived DNA”</td>
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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 and reputation of the university as a center of innovative research and scholarship. In keeping with the university’s commitment to advancing the frontiers of knowledge, the press produces books that open up new areas of inquiry while also bringing fresh insight and perspective to established fields. These peer-reviewed books, many award-winning, are offered at affordable prices in both print and electronic formats. Editorial is overseen by a faculty board whose members represent a broad spectrum of academic departments.

In FY13, the press published 37 new titles, reprinted an additional 90 titles, and first released 77 backlist titles in e-book editions. All told, more than 40,000 volumes were shipped to customers in the United States and abroad. Net sales for the year amounted to $777,000, and authors earned more than $68,000 in royalties. Among the notable awards received by UMass Press books in FY13 were the following:

Peter Benes’s *Meetinghouses of Early New England* won the 2012 Kniffen Award of the Pioneer America Society, presented to the best book in the field of North American material culture.

Christopher Daly’s *Covering America: A Narrative History of a Nation’s Journalism* received the 2012 Prose Award of the Association of American Publishers for the best book on media and cultural studies. The Prose Awards annually recognize “the very best in professional and scholarly publishing by bringing attention to distinguished books, journals, and electronic content in over 40 categories.”

Denise Meringolo was presented with the 2013 NCPH Book Award for *Museums, Monuments, and National Parks: Toward a New Genealogy of Public History*, deemed the best book about or growing out of the field of public history.

Barbara Hochman’s *Uncle Tom’s Cabin and the Reading Revolution* received the 2012 DeLong Book History Book Prize from the Society for the History of Authorship, Reading and Publishing.

Christine Pawley’s *Reading Places: Literacy, Democracy, and the Public Library in Cold War America* won the 2012 Jennifer Monaghan Book Award from the International Reading Association. It was also named winner of the 2013 Eliza Atkins Gleason Book Award of the Library History Roundtable of the American Library Association, presented every third year to recognize “the best book written in English in the field of library history.”

Lawrence Goodheart’s *The Solemn Sentence of Death: Capital Punishment in Connecticut* was named winner of the Homer D. Babbidge Jr. Award from the Association for the Study of Connecticut History. Peter Hinks, chair of the awards committee, described the book as “an example of the finest scholarship on American legal and social history, applied to a topic whose gravity and complexity pertain every bit as much to our own day as they do to the past.”

M.J. ALHABEEB (resource economics) and L. J. Moffet: Managerial Economics: A Mathematical Approach. (Paul Wiley and Sons).

MARI CASTAÑEDA (communication) co-editor with Kirsten Isgro: Mothers in Academia. (Columbia University Press).

PATRIZIO CECCAGNOLI (languages, literatures, and cultures), translator and co-editor with Susan Stewart: Theme of Farewell and After-Poems: A Bilingual Edition by Milo de Angelis. (University of Chicago Press).

PAULA CHAKRAVARTTY (communication), Denise Fereira da Silva: Race, Empire and the Crisis of the Subprime. (Johns Hopkins University Press).

OLGA GERSHENSON (Judaic and Near Eastern studies): The Phantom Holocaust: Soviet Cinema and Jewish Catastrophe. (Rutgers University Press).

ALINE GUBRIUM (public health) and KRISTA HARPER (anthropology): Participatory Visual and Digital Methods. (Left Coast Press).


LISA HENDERSON (communication): Love and Money: Queers, Class and Cultural Production. (NYU Press).


BARBARA KRAUTHAMER (history) and Deborah Willis: Envisioning Emancipation: Black Americans and the End of Slavery. (Temple University Press).

Laurie Lovett (history) and Lori Rotskoff, eds.: When We Were Free to Be: Looking Back at a Children’s Classic and the Difference It Made. (The University of North Carolina Press).

ROBERT LUDOVICO (Italian studies) and other co-editors: Renato Poggioli: An Intellectual Biography. (Olschki Editore, Florence Italy).

MARLA MILLER (history) and MAX PAGE (architecture and history): The University of Massachusetts Campus Guide. (Princeton Architectural Press).

CATHERINE PORTUGES (comparative literature) and Peter Hames, editors: Cinemas in Transition in Central and Eastern Europe after 1989. (Temple University Press).


DONALD THOMASKOVIC-DEVEYM (sociology) and Kevin Stainbeck: Documenting Desegregation: Racial and Gender Segregation in Private-Sector Employment Since the Civil Rights Act. (Russell Sage Foundation).

KEVIN YOUNG (political science) et al.: Gridlock: Why Global Cooperation is Failing when We Need It Most. (Polity Press).

PAIGE WARREN (environmental conservation) and Christopher Lepczyk, editors: Urban Bird Ecology and Conservation. (University of California Press).


The image to the left depicts one of the most abundant methane-producing microorganisms on earth, *Methanosaetaes* (in blue). For 40 years, scientists thought they understood how certain bacteria work together to anaerobically digest biomass to produce methane gas, important in bioenergy and the major source of greenhouse gas. UMass Amherst microbiologist Derek Lovley, postdoctoral researcher Amelia-Elena Rotaru, and colleagues show for the first time that these organisms make direct electrical connections with another species to produce the greenhouse gas in a completely unexpected way. This research discovery could be a key to developing efficient bioenergy strategies. Learn more at umass.edu/researchnext.