

In brief

Economic Development



NEW LEGISLATION AND ROADMAP POSITION UMASS FOR S&T LEADERSHIP

To friends of UMass:

The year 2004 is shaping up to be a year of exciting new opportunities for the University of Massachusetts. These opportunities have been made possible by the January passage of the \$100 million science and technology legislation to stimulate the state economy, and the release of Mass Insight's *Science and Technology Roadmap* in February.

The S&T bill represents an historic, bipartisan initiative that provides matching funds for R&D initiatives, support for regional technology development, assistance to science and engineering pipeline activities, and establishment of a new, state-wide Technology Transfer Center at UMass.

What does this bill mean for UMass and the Commonwealth? It could yield matching funds that would enable Northeastern and UMass Lowell to win an NSF-sponsored center for nanotech manufacturing, or for UMass Boston to secure support for a new enviro-tech center. It could also mean new support for emerging UMass regional partnerships — between Amherst and Baystate Medical Center in the Pioneer Valley, between our medical center and the biotech industry in Central Massachusetts, and between Dartmouth and the marine tech industry in the South Coast. The bill also positions UMass at the center of new efforts to increase commercialization of university technology in Massachusetts.

The Mass Insight study — *Choosing to Lead: Winning the Race for R&D Leadership and Jobs in the Innovation Economy* — highlights the state's growing vulnerabilities in the competition for national and global R&D and high-tech jobs. It represents a growing consensus

in Massachusetts about the importance of public/private collaboration and aggressive state action to maintain our leadership in R&D and build a science and technology-based economy in all parts of the state.

The report specifically challenges UMass to play a more active role in developing itself as a major research university, reversing the state's "brain drain," partnering with Massachusetts industry, and providing the infrastructure for technology-based economic development in the regions of the state outside of Route 128. And it challenges the state to reverse its historic pattern of underinvestment in UMass and to move toward a long-term, stable pattern of strategic investment in the state's public research university.

We at UMass stand ready to build upon new opportunities for growth in the state's S&T sector. Since the beginning of the year, we have organized the first-ever UMass High Tech Executive Council to advise us on our linkages with the high-tech community, launched a Technology Development Fund to move more of our technologies closer to commercialization, and established a \$1 million S&T Initiatives Fund to support our faculty in developing new S&T proposals and alliances.

With continued public and private support, we at UMass will do all we can to ensure a bright and healthy high-tech future for all regions of the Commonwealth.

Sincerely,

Jack M. Wilson, President

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RNAi Among Top-10 Scientific Discoveries

Science magazine again has recognized the work of UMass Medical School faculty member Craig S. Mello, noting his achievements in gene silencing as one of the top-10 breakthroughs of the year. Dr. Mello's work in RNAi interference was highlighted as the top breakthrough of 2002, and remains in the top-10 list for 2003. In collaboration with colleague Andrew Fire, Ph.D., of the Carnegie Institution in Washington, Dr. Mello discovered a process by which a particular form of RNAi can silence targeted genes. This technique has significant applications both in biological research and pharmaceutical production. Several companies already are working to develop drugs based on RNAi, including Worcester-based Araios Inc. which is developing drugs for the treatment of obesity, diabetes, and Lou Gehrig's disease.

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UMass Amherst Launches MassNanoTech

UMass Amherst, a leader in nanoscale scientific research, is establishing an interdisciplinary research center in nanotechnology, the science of developing advanced materials and devices with extremely small dimensions. The center, called MassNanoTech, initially will focus on the field of nano-electronics as a means to further reduce the size of micro-electronic components. Other applications of molecular-scale technology at UMass include sensors and detection, life sciences, catalysis and separations, and new functional materials. According to center co-director and physics professor Mark Tuominen: "With techniques like this, we have the potential to get the contents of 25 DVD movies on a disk the

size of a quarter." MassNanoTech will be an active partner with Massachusetts industry to spawn technologies that are integrated with emerging technology platforms. UMass Amherst is well-suited for this venture, placing seventh nationally in new nanotech research grant funding during the past three years (according to the National Science Foundation) and receiving over \$22 million in nanotech research funding since 1996.

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UMass to Lead Green Chemistry Consortium

UMass Amherst will serve as the lead institution in the federally funded New England Green Chemistry Consortium. This is the first regional program of this type, bringing together the land grant institutions in the other five New England states (Universities of Connecticut, Maine, New Hampshire, Rhode Island, and Vermont), as well as UMass Boston and UMass Lowell. The consortium will coordinate, expand, and disseminate green chemistry research, education, and policy. Formation of this center represents significant expansion of existing efforts at several area campuses to collaborate with industrial partners as well as federal and state agencies to investigate and address environmental issues associated with materials production and utilization. The consortium also has the mission to develop a well-defined outreach program to educate students on the various campuses and provide a forum for dialogue with the general public.

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Federal Funds Support UMass Dartmouth S&T Efforts

Research on fisheries, textiles, and cranberries conducted through UMass Dartmouth will benefit from over \$6 million in federal funding. The School for Marine Science and Technology at UMass Dartmouth will receive \$3 million in funding and the Massachusetts Marine Fisheries Institute will receive \$2 million as outlined in the current Omnibus Appropriations Bill. These monies will support efforts to promote the fishing industry in Massachusetts, including enhanced data collection and fisheries management. In separate activity, legislation has been passed for over \$1 million to be used for the National Textile Centers program at UMass Dartmouth and for cranberry research at the UMass Cranberry Station in East Wareham, both industries which play a vital role in the economy of the southcoast region.

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Mass Bio Labs Targeting SARS Treatment

The Massachusetts Biologics Laboratories (MBL) continues the work it began last summer developing a treatment for severe acute respiratory syndrome (SARS). MBL is a leader in developing monoclonal antibodies (MAbs), or molecules which target cells to eradicate disease and are directly injected to fight offending viruses. Attesting to the power of MAbs, MBL director Dr. Donna Ambrosino noted, "We and others think that it's highly likely to work to prevent SARS infections in patients." MBL's work developing a preventive approach has already generated good results in laboratory tests. The results were

shared at the annual meeting of the Infectious Diseases Society of America in October. Since that time, the research has made significant progress with candidate monoclonal antibodies now being assessed in animals.

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NSF Grants Over \$11M to UMass Amherst Computer Science Department

Faculty in the department of computer science at UMass Amherst will collaborate on more than \$11 million in grants from the National Science Foundation (NSF) to support four collaborative research projects focusing on marine science, data mining, computer networking, and network measurement infrastructure. The funding was awarded through the highly competitive Information Technology Research (ITR) Program. The computer science faculty also is teaming with the electrical and computer engineering department in the university's recently announced \$40 million Engineering Research Center (ERC). Funded in part by the NSF, the Center for the Collaborative Adaptive Sensing of the Atmosphere is expected to increase the warning time for tornadoes, flash floods, and other severe weather disturbances with far greater accuracy than existing systems. Notes computer science chair Bruce Croft, "Our success with both the ITR and the ERC awards is a clear demonstration of the quality of our faculty and the computer science program at UMass Amherst."

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UMass Medical School Partnering with J&J Wound Management

UMass Medical School (UMMS) is collaborating with Johnson & Johnson Wound Management, a division of Ethicon, Inc., to establish the University of Massachusetts Center for Research in Wound Management. The Center, created with a combined annual investment of \$1 million from the corporation and UMMS, will bring together clinical researchers in the UMMS Division of Plastic Surgery and researchers from Johnson & Johnson Wound Management to focus on the development of emerging wound-care technologies. According to Raymond Dunn, MD, Chief of Plastic Surgery at UMMS, "The collaborative effort of both industry and academic resources will benefit patients by improving the way state-of-the-art medical products are developed and brought to patient care." This arrangement exemplifies the type of technology transfer activities taking place at UMMS, whereby industry/university collaborations promote commercialization of university-developed technologies and generate innovative products and processes.

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UMass Amherst Conducts Groundbreaking Microbe Research

UMass Amherst microbiologist Derek Lovley discovered the microbe *Geobacter* in 1987, and has since developed potential applications for its use in processes ranging from bioremediation to electricity generation. *Geobacter* is a powerful iron-breathing microbe which may someday serve as an alternative energy source. Colleague Barbara Methe's work with *Geobacter* resulted recently in the complete genetic sequencing and

analysis of the microbe. According to Dr. Lovley, the sequencing project "changes the way we do biology [and has] really brought genomics to UMass." Last year, Dr. Lovley was awarded an \$8.9 million, three-year grant to decode and analyze more than 600 pairs of base genes in microbes that have potential for uranium bioremediation of soil and electricity production. UMass Amherst is the only public university in the country to serve as a project leader in this effort. Dr. Lovley's cutting-edge research has recently received national coverage in both *Time* and *Science*.

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New Healing Tools Developed by UMass Lowell

Two UMass Lowell researchers are leading the way in innovative approaches to wound healing. For over two years, biology professor Susan Braunhut has been working with chemistry professor Kenneth Marx of the Center for Intelligent Biomaterials to develop a "Smart Bandage" which can improve the healing rate of a wound by 50%. Their technique involves creating a customized bandage which can treat specific wounds, from lacerations to burns and bites. Beginning with funding from the National Institutes of Health (NIH) and the Lowell campus, the pair recently was awarded a grant from the federal Defense Advanced Research Projects Agency (DARPA). With potential applications across many areas, Professors Braunhut and Marx currently are exploring ways to commercialize Smart Bandage.

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Technology COMMERCIALIZATION & entrepreneurship

UMass Ranks #17 among US Universities in License Income

The most recent survey of the Association of University Technology Managers (AUTM) shows that UMass earned \$14.9 million in technology licensing income for FY '02. As in the past, the lion's share of this income has been generated by the University's Medical Center in Worcester and the Massachusetts Biologics Lab in Boston. This new level of earning ranks UMass as #17 among all American research universities in license income generated, maintaining the same rank it earned in FY '01. Other high-ranking Massachusetts institutions include MIT (#11) and Harvard (#16). UMass has generated \$20.3 million of income in FY '03.

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Record-setting First Quarter for UMass Licensing Office

UMass's Office of Commercial Ventures and Intellectual Property (CVIP) has reported on first-quarter activity for FY '04. This includes: 45 faculty invention disclosures, 46 patent applications, four patents issued, 12 licenses completed, and \$13.8 million in license income. The level of license income is the largest for any single quarter in the university's history. It is largely comprised of two elements

— license of a vaccine technology at the Massachusetts Biologics Lab and a new license for RNAi technology at UMass Worcester.

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State-Wide Tech Transfer Center to be Created at UMass

Under the state's new S&T legislation, UMass is to establish the Massachusetts Technology Transfer Center (MTTC). The purpose of the center is to promote the transfer of technology from Massachusetts public and private universities to Massachusetts industries. The university is consulting with state officials, business leaders, private universities, venture capitalists, and others in designing this new center. The MTTC will develop improved mechanisms to connect the technology assets of the state's universities with the needs of the state's technology-based industries (e.g., medical devices, marine technologies, plastics, and other materials). UMass soon will be selecting an advisory committee as well as recruiting an executive director and small staff to help operate the MTTC.

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CVIP Launches Technology Development Fund

UMass's Office of Commercial Ventures and Intellectual Property (CVIP) has established a new technology development fund to assist university researchers with the commercial development of important technologies discovered on the university's five campuses. The fund is part of the university's science and technology action agenda developed by President Jack Wilson. The grants are intended to support proof of concept, prototyping, or other critical steps necessary to make technologies attractive for licensing or other forms of commercialization. The initial fund for FY '04 is \$100,000, and it is anticipated that this amount will increase in future years as revenue from technology licensing grows. Interested university researchers can learn more about the fund by visiting: <http://www.cvip-umass.net> and clicking on the *What's New* section.

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Future Workforce

UMassOnline Enrollment and Revenues Thriving

After only three years of existence, UMass-Online (www.umassonline.net) has assumed a leading position as an online education provider. With a current enrollment of 13,000, UMassOnline continues to enjoy significant growth. As the online education division of the university, UMassOnline provides students with the opportunity to earn certificates and degrees in 37 programs, ranging from business and IT to nursing and criminal justice. In 2003 UMass-Online won the US Distance Learning Association Excellence in Distance Teaching Award and the Sloan Consortium Award for Effective Practices in Student Satisfaction. Its online programs, which are closely coupled with UMass's accredited, face-to-face programs and taught by the same outstanding faculty, have garnered significant student interest and generated \$11 million in tuition revenue in 2003. Students cite convenience, flexibility, and high caliber professors as UMass Online's greatest strengths. With revenues growing at 40% per year and enrollment increasing by 32%, UMassOnline is well-positioned for continued future success.

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UMass Lowell Launches New Online Homeland Security Program

Since the events of September 11, 2001 the U.S. Department of Labor has been predicting that the threat of terrorism will cause the security management field to grow faster than any other occupations. Recognizing this demand, UMass Lowell is launching their new, online Certificate Program in Security Management and Homeland Security. Offered under the auspices of the UMass Lowell Criminal Justice Department in concert with Continuing Stud-

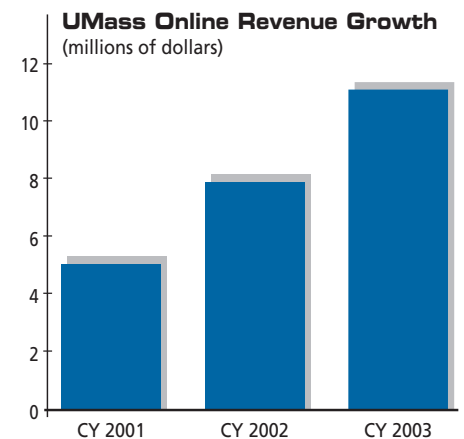
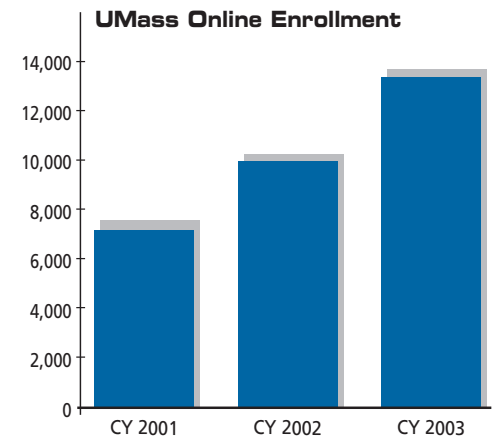
ies, Corporate, and Distance Education, this part-time certificate program is designed for those working in the areas of public safety, security management, and law enforcement as well as IT professionals and corporate executives responsible for overseeing in-house security programs. It also will benefit criminal justice students interested in enhancing their future career prospects by broadening their studies to encompass security within private industry.

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Amherst and Lowell Campuses Join to Train Science Teachers Online

The National Science Foundation has awarded a three-year, \$1.2 million grant for a collaboration between the Schools of Education at UMass Amherst and UMass Lowell to support the development, implementation, and assessment of a model, Web-based licensing program for middle-school science teachers. The project will provide an online master-of-education degree with a concentration in science education. The program meets national and Massachusetts standards and leads to professional licensure for general science teachers (grades 5-8) who live in the state. It will serve both urban and rural middle-school teachers by enabling them to study science content and pedagogy in depth, and to research and assess distance-learning technologies and teaching methodologies, all online. The program fills a vital need given the state's shortage of classroom teachers licensed in science education.

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ECONOMIC ANALYSIS for the COMMONWEALTH

UMass Donahue Institute and MassINC Study State Migration

The Commonwealth is losing the national competition for skilled workers, according to new research conducted by the UMass Donahue Institute's Economic and Public Policy Research Unit in collaboration with faculty from UMass Amherst and the Massachusetts Institute for a New Commonwealth (MassINC). The report, entitled *MASS.Migration*, is a joint project of the Institute and MassINC and was underwritten by MassHousing. Key findings from the report indicate that: the Commonwealth has lost more people than it has attracted over the last 12 years; the state is exporting a substantial number of residents to the rest of New England, particularly native-born, middle-class families; and the state is narrowly winning its fight to attract young, highly educated talent from competitor states. Since its release, this report has garnered an extraordinary level of media attention from newspapers, radio and television stations, and editorial boards across New England.

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UMass Boston Professor Leads Study of the Medical Device Industry

In partnership with the Massachusetts Medical Device Industry Council (MassMEDIC) and UMass Donahue Institute's Economic and Public Policy Research Unit, UMass Boston Professor Alan Clayton-Matthews is conducting a comprehensive study of the critical and rapidly changing Massachusetts medical-device industry. A full report based on the results of the study is scheduled to be released next May at MassMEDIC's annual meeting. This is the second time that MassMEDIC has turned to the University of Massachusetts for industry analysis and insight. The first report was released three years ago and has had a significant impact. According to MassMEDIC President Tom Sommer, data culled from the UMass report was used by Phillips Medical Systems, one of the largest medical device employers in Massachusetts, in making its decision to locate operations in Andover. This site is now home to several thousand employees.

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Comprehensive Housing Study Released

The state's inability to keep pace with housing demand is forcing more than 600,000 households to spend more than 30% of their income on housing. Approximately 250,000 of those are spending more than 50% of their income on housing, a burden felt most by lower-income families and young adults. The study, conducted by the UMass Donahue Institute's Economic and Public Policy Research Unit, uses the 2000 census and other data to quantify the state's housing shortfall and its impact on the population and land-use patterns. The study concludes that the state's failure to meet housing demands has created a three-class system of "haves," "have nots," and "hidden homeless," a growing third class of people who live with relatives or friends because they can't find affordable housing. Co-sponsored by the Citizens Housing and Planning Association and the Massachusetts Housing Partnership, the study concludes that the state's failure to keep up with housing demand, especially in multi-family and high-density housing, has driven costs of existing housing to unmanageable levels. The study urges the construction of more multi-family and more densely built single-family units, thus relieving the pressure on those with low incomes or who are new to the housing market.

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can be found on the Web at
www.umassp.edu/econdev/inbrief

The University of Massachusetts is pleased to announce the formation of the
UMass High Technology Executive Council,
a 17-member panel of high-tech industry experts who will advise the president
and UMass leaders on ways that the university's five campuses can help
strengthen the Commonwealth's technology-based economy.

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