

CHANCELLOR'S MESSAGE

FROM JAY A. PERMAN



What Makes Us Strong

It's clear that higher education drives strong and sustained prosperity. After all, we produce the graduates who fill the jobs that power the knowledge economy. We conduct the research that's translated into marketable technologies. We partner with agencies, business, and industry to create a culture of innovation.

All of this has an undeniable impact on economic growth. But if we leverage our assets in the right way, we can do even more.

Let's start with our biggest asset: our students, 170,000 of them. The University System of Maryland (USM) awards eight in every 10 bachelor's degrees in the state. And 80 percent of our undergrads are from Maryland, meaning they're more likely to stay here after graduation. These alumni make Maryland what it is—perennially in the U.S. top 5 for household income, four-year degrees, STEM workers, PhDs and engineers, technology and innovation.

Plus, fully half of our students graduate with no loan debt whatsoever. This comes from years of limiting tuition hikes and expanding financial aid. And it's important, because a workforce that's not debt-constrained is one that puts down roots more quickly: buying a home, getting married, having kids. People who have money are people who *invest* it—in themselves, and their families, and their communities.

We can make this dream possible for more Marylanders. We're working with academic leaders at all levels—elementary, secondary, postsecondary—to make an education pipeline that doesn't "leak" students along the way. We're working with community colleges to streamline credit transfer and facilitate the transition from a two-year to a four-year degree. We're focused on retaining the students we already enroll, improving the academic, advising, and financial support that puts them over the degree finish line.

We're serving Maryland's adult learners who want to finish college, or improve their skills, or change careers. We're building flexibility into when, where, and how they learn. We're expanding the portfolio of credentials we offer them, like certificates and badges, and securing commitments from employers to recognize and reward these credentials.

The point isn't only to give every learner every opportunity to succeed, but to succeed in *Maryland*.

MARCH 2021

The USM Means Business

Maryland Momentum Fund: Equity Investments Supporting Maryland Companies and Jobs

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If our students are the USM's biggest asset, the community we surround them with is a close second—a community where ideas matter, where discovery is transformational, where “open” is the goal, because there’s no power in knowledge that never leaves our campuses.



Featured Video: Discover how the USM is preparing the state's workforce for high-tech careers, generating new companies, and driving Maryland's innovation economy.

We’ve long modeled openness in our research and scholarship, translating our work into products, practices, and policies that have a material effect on our well-being and our world. But now we’re getting bolder. We’re creating more companies from our own intellectual property, and licensing our IP to others who can run with it. We’re building communities of entrepreneurs (aspiring and established) committed to innovation and risk-taking—to learning with and from one another. We’re making it easier for industry to do business with us, and accelerating how fast they’ll see commercial and financial returns.

And after years of persuading others to invest in the USM’s incredible people and ideas, we’re investing in them ourselves. In one year, our Maryland Momentum Fund has nearly doubled its number of portfolio companies, and external co-investment has nearly tripled. But support is often just as important to these companies as money. Eighty percent of startups *remain* in the communities where they first received significant mentoring or investment. And so we’re growing the resources we offer these early-stage companies—and others still younger in their development—so we can keep the best talent and innovation right here in Maryland.

We’re investing, too, in the power of place, reaching into our communities with spaces for creativity and collaboration: research parks, co-working labs, incubators and accelerators, innovation districts. There’s an accumulating power that comes from working elbow to elbow in spaces dense with ideas—bringing together science, business, and capital, and seeing an ecosystem take shape.

But these spaces aren’t just about quantum, or cyber, or biotech, or any other sector. They bring jobs and job training, they bring partners and investment, they bring follow-on development—restaurants, retail, offices. They bring the infrastructure that supports it, and the transportation that makes it all move. If done right, they create community and spread wealth.

And this is key, because economic growth means nothing without economic *inclusion*. Our USM universities are inextricably tied to their communities and their neighbors. We rise and fall together. And, together, we’re rising.

Sincerely,

A handwritten signature in black ink that reads "Jay A. Perman". The signature is fluid and cursive.

Jay A. Perman
Chancellor, University System of Maryland



AROUND THE USM

The USM Means Business

The USM has always been about education, invention, and economic impact.

Our institutions enroll more than 170,000 students and award 42,000 degrees every year, accounting for roughly 80 percent of all bachelor’s degrees and 80 percent of all STEM degrees awarded in Maryland. And last year, the USM concluded its three-year, \$33 million

workforce development partnership with the state—an effort that should ultimately generate 3,000 new degrees and other credentials every year in cybersecurity, health care, engineering, and other critical and emerging fields.

A soon-to-be-released report from the University of Baltimore's Jacob France Institute (JFI) looks closely at this USM investment in human capital. Isolating specific cohorts of students (those earning degrees in 1986, 1989, and 1996), the JFI found that each USM graduate will earn about \$2.5–\$3.3 million dollars more over his or her lifetime than a Maryland resident with only a high school diploma. These higher earnings yield a direct benefit to Maryland, as USM graduates collectively provide \$750 million–\$1 billion in state sales and income taxes over their lifetimes. And that means Maryland receives \$4.70–\$6.70 in taxes for every \$1 the state invests in the USM.

Of course, the system's economic impact is driven by far more than the graduates our universities produce. The USM attracts \$1.5 billion in external grants and contracts annually. It's home to three research parks supporting nearly 300 tenants and 10,000 jobs. It houses 10 business incubators and co-working facilities with 175 corporate tenants.

These numbers are the direct result of deliberate decisions made to leverage the USM's strength in discovery, innovation, and business/industry collaboration. The system established an Economic Development and Technology Commercialization Committee within the Board of Regents and created the position of vice chancellor for economic development to ramp up tech transfer and entrepreneurial support across the USM. Here's just one indicator of success: Since 2012, more than 100 startups have been launched based on technology coming out of USM universities. That accounts for more than half of all university-affiliated startups formed in Maryland over that same time.

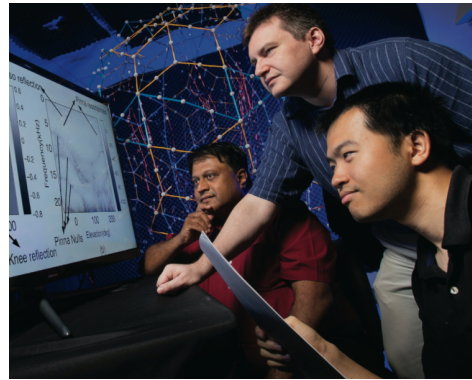


Photo: John T. Consoli / UMCP

One of the newest companies in the Maryland Momentum Fund's portfolio, VisiSonics develops spatial audio solutions and acoustic visualization hardware based on technology developed at the University of Maryland, College Park.

In 2017, the USM launched a \$10 million early-stage investment fund, marking the first time the system became an equity investor in university-affiliated startups. The Maryland Momentum Fund has invested in 20 USM-affiliated companies to date, with total internal investment at \$6.9 million. Those USM and university funds are supported by more than \$43 million from external co-investors.

In 2016, the University of Maryland Strategic Partnership Act codified the structured alliance between the University of Maryland, College Park and the University of Maryland, Baltimore—an alliance established to advance academic collaboration, grow interdisciplinary research, and commercialize university innovations. Last fiscal year alone, the two universities disclosed 333 inventions, licensed 48 technologies, and launched 13 startups. Additionally, the two institutions are now recognized as one research enterprise. And with \$1.1 billion in R&D expenditures, that single enterprise—the University of Maryland—ranks 8th among the nation's public research universities and 14th overall.

The University System of Maryland has always been an important contributor to state-level economic growth. But by focusing our efforts and attention on workforce development, discovery, and technology commercialization, our impact is greater than it's ever been. The system is a key driver of the state's innovation economy—steering it, strengthening it, and investing ourselves in keeping Maryland out in front.

Maryland Momentum Fund: Equity Investments Supporting Maryland Companies and Jobs

Created as an early-stage investment fund to support the most promising USM technologies and people, the Maryland Momentum Fund (MMF) has two goals: 1) Make money to reinvest

in additional USM-affiliated startups; and 2) support the growth of Maryland's entrepreneurial ecosystem.

Since November 2017, when the fund made its first investment, MMF has backed 20 USM-affiliated companies, supporting them as they form, grow, and bring new jobs to Maryland.

The need for an early-stage fund was clear: While there are numerous initial-stage seed capital investors and significant downstream investors, the sources of capital in between are scarce. That's the gap the Momentum Fund bridges, allowing young businesses to mature to a point where they can raise additional funding or be acquired. To help the companies meet either outcome, MMF staff and institutional partners foster connections that provide these early-stage entrepreneurs with advice and support from industry experts and leaders.

Momentum Fund portfolio companies must be based in Maryland and are affiliated with a USM institution in at least one of three ways: the company is based on university-owned intellectual property; it was founded by a university faculty or staff member, student, or alumnus/alumna; or it's located in a university-affiliated research park or incubator. The fund's first investment was \$200,000 in MF Fire, a company producing eco-friendly wood stoves, which was founded by two graduate students in the University of Maryland, College Park's Department of Fire Protection and Engineering.

With the appointment of career entrepreneurial executive Claire Broido Johnson as MMF's managing director in 2019, the pace of investment activity has accelerated. Total internal investment to date—that's the MMF investment, plus that of the parent universities—stands at \$6.9 million, which has been supported by more than \$43 million from co-investors.

Among the fund's most exciting portfolio companies is Veralox Therapeutics, a biotechnology company co-founded by a University of Maryland, Baltimore alumnus that's developing first-in-class small molecule therapeutics to treat patients with rare blood disorders. In 2019, the Momentum Fund announced a \$500,000 investment in Veralox, as part of the company's \$5.4 million seed round, which included pharmaceutical giant Sanofi as a co-investor. The FDA recently granted Orphan Drug Designation—a special status for pharmaceutical agents that treat exceptionally rare medical conditions—to Veralox's VLX-1005. MMF recently followed on with an additional \$250,000 investment in a bridge round.

With the Momentum Fund firmly established, efforts are underway to broaden its reach—to “widen the top of the funnel,” in the words of Broido Johnson—and take full advantage of the diverse strengths and talent of all 12 USM institutions.

A \$150,000 investment (in a \$600,000 round) made a year ago in Minnowtech illustrates this push. Minnowtech is an aquaculture technology company co-founded by University of Maryland Center for Environmental Science graduate Suzan Shahrestani. It was MMF's first investment in a female-led company and the first in a company not affiliated with one of the USM's three major research universities.

Shortly thereafter, InferCabulary, an ed-tech startup created to deepen vocabulary skills, became the first Momentum Fund investment (\$250,000) connected to Towson University's TU Incubator, with its founder also a Towson grad.

As a rule, venture-backed tech startups take seven years to mature to an exit, meaning the Maryland Momentum Fund is still a few years away from generating long-term financial returns. But other indicators of success—creating and retaining jobs, developing the USM's innovation ecosystem, commercializing USM intellectual property—are positive. And with potential financial gains being reinvested in future startups, the fund's impact will only grow.



As a doctoral student at the Chesapeake Biological Laboratory at the University of Maryland Center for Environmental Science, Minnowtech CEO Suzan Shahrestani developed an imaging tool being used to help shrimp farmers optimize their yields.



USM Research Parks: Instruments for Innovation, Job Creation, and Economic Growth

While academia and industry have long worked together in close collaboration, today they're inextricably linked. And when moving together, public higher education and private enterprise form a powerful economic tandem.

The USM's research parks deepen this connection: They facilitate the flow of ideas between universities and companies, accelerating the transfer of technology from the academy to the private sector. They foster innovation, create jobs, and attract investment in their tenant companies and in the communities in which they reside. The USM is home to three research parks affiliated with the system's three research universities: the University of Maryland, College Park (UMCP), the University of Maryland, Baltimore (UMB), and the University of Maryland, Baltimore County (UMBC).

Encompassing 2 million square feet and employing 6,500 people, UMCP's Discovery District is Maryland's largest research park. The district leverages public-private partnerships—with faculty, students, researchers, and businesses working together to advance discovery, commercialize technology, and generate jobs. Most recently, IonQ, a quantum computing hardware and software company headquartered in the Discovery District, became the first-ever quantum computer company to go public, doing so with a \$2 billion valuation.

The first university-based research park in Maryland—bwtech@UMBC—has expanded to 525,000 square feet, supporting some 130 companies and 1,800 employees. Through the Cyber Incubator, a partnership with Northrop Grumman, and other efforts, the park has a particularly strong emphasis on cybersecurity. bwtech@UMBC also prides itself on building business relationships with faculty and students, and 95 percent of the companies have a link to UMBC through a faculty member or student intern.



At the University of Maryland, Baltimore's BioPark, life science companies and academic research centers come together to commercialize new drugs, diagnostics, and biomedical devices.

The UM BioPark at UMB is Baltimore's largest biotech cluster, fueling the translation of research and the commercialization of new drugs, diagnostics, and devices. At full build-out, the 14-acre park will boast 2 million square feet of lab and office space and employ about 2,000 people. In 2019, BioPark tenant Paragon Bioservices was acquired by contract drug manufacturer Catalent for \$1.2 billion. Following the acquisition, Paragon's founder affirmed his BioPark loyalty, basing his new venture in the same park.

While these three universities are unquestionably leaders in research park development, by no means are they the only system universities operating in this space. Institutions across the USM are now—or will soon be—home to incubators, accelerators, and innovation and entrepreneurship centers that allow university faculty and staff to work shoulder to shoulder with business and industry partners.

On the Eastern Shore, the Salisbury University Downtown Center for Entrepreneurship—slated to open later this year—will support, mentor, and launch community businesses. The center will offer shared co-working space, a wet lab, and a makerspace for robotics and other technology-enhanced products.

Towson University's TU Incubator supports venture creation and small business growth. And opening later this year, Towson's accelerator—StarTUup at the Armory—will connect the TU campus with the Greater Baltimore business community.

Also opening later this year, the Entrepreneurship Living Learning Community at Bowie State University (BSU) will serve as a real-world innovation hub. The community will house 500+ students, along with the BSU Entrepreneurship Academy and the Bowie Business Innovation Center—the very first business accelerator at a Maryland HBCU.

There's an energy in working across sectors, moving ideas and technologies from the lab to the marketplace, growing companies whose products benefit humanity and whose success stokes economic growth. Research parks and innovation districts, incubators and accelerators, connect the USM to business, building a collaborative culture of innovation that powers the state.



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