2023 ANNUAL REPORT

UWM RESEARCH FOUNDATION

Guiding Innovation. Fostering Partnerships.

BOARD CHAIR WELCOME

UWM is at a critical point in rethinking how to best serve students and train talent for the future of Wisconsin. As the new UWMRF Board of Directors Chair, I am committed to the team as they develop new strategies that will reinforce the profile of UWM while providing even more value to innovators and corporate partners. I encourage you to connect with the UWMRF Board of Directors to learn more about how we can drive continued growth in the UWM research enterprise. The support from regional foundations and generous donors has been essential to the success of the innovations and startups shared in this report, and I am excited to be a part of their efforts.

Craig Rigby
Vice President of Technology, Clarios
UWMRF Board Chair 2023

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CHANCELLOR'S WELCOME

These are complicated times for higher education: Demography challenges enrollments and budgets, states' decreased funding of higher education contributes to higher student debt and concerns about value, and a host of other challenges exist nationally and locally. Despite these complexities, the UWM Research Foundation continues to contribute to our research mission and evolve to meet the dynamic times in which we live. As part of that evolution, it's my pleasure to welcome our new UWMRF President, Dr. Jessica Silvaggi. Dr. Silvaggi has been a long-time veteran of the Foundation and most recently served as its vice president. I'm grateful for her leadership and that of our board and the firms they represent, for contributing to our continued ascent in rankings and accomplishments.

The UWMRF team works on innovative avenues of technology transfer that focus on industry partnerships, corporate relations, and support of UWM startup companies. As we work to strengthen our R1 research institution status from the Carnegie Classification of Institutions of Higher Education, UWM must grow its levels of industry-sponsored research and federal funding. UWMRF offerings such as Panther Partnering for companies and the startup express license for UWM innovators make it easier to license intellectual property created at our university and to do so quickly, transparently, and collaboratively.

An expanded culture of care for students and employees is critical to our campus, and the UWMRF team is a key example of a concierge service providing commercialization education and support to faculty, staff, and student innovators.

I look forward to great achievements ahead.

Best regards,

Mark A. Mone, PhD

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UWMRF KEY STRATEGIC PLAN

Guiding Innovation, Fostering Partnerships

The UWM Research Foundation was formed to serve and support UWM faculty and student research through corporate research partnerships; igniting UWM-founded startups; and leveraging our intellectual property expertise to further support innovation, entrepreneurship, and collaboration with our community and worldwide.

Our vision is to attract funding and industry/corporate partners to advance and develop innovation at UWM.

UWM RESEARCH FOUNDATION

2024 KEY PRIORITIES

01

GROW RESEARCH DOLLARS
Increasing capital spurs innovation.

02

IGNITE UWM STARTUPS WITH FUNDING
Funding support is fuel to the fire.

03

ENHANCE BRAND AWARENESS
Uplevel the public profile for the UWMRF.

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UWM'S INNOVATION ENGINE

Generous funding from organizations like the Wisconsin Economic Development Corporation (WEDC) provide financial support of entrepreneurs and innovative programming. These grants and donations allow UWMRF-supported faculty, students and staff to continue to make an impact on the world around us.

- **190** Issued Patents
- **100** Patents Pending
- **45** License/Option Agreements
- **15** UWMRF Startups

THE STATE SUPPORTS UWM ENTREPRENEURS

To date $400,000 in Bridge Grants have been awarded to ten unique UWMRF startups, thanks to a WEDC grant of $200,000 that was matched 1:1 by individual donors, Bader Philanthropies, and Clarios. These startups have gone on to obtain an additional $9.9M in grant and investment funding. We are grateful for a new grant of $100,000 from the WEDC to continue this fruitful program and are currently seeking matching funds from supporters. In addition, funding from WEDC allowed for a new program to provide small awards to new startups that participated in the Milwaukee I-Corps training program. Fifteen startups received funds to hire consultants or work on developing their prototypes.

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CONCRETOLOGY LLC
KONSTANTIN SOBOLEV

Dr. Konstantin Sobolev's startup, Concretology, aims to commercialize a long-lasting water repellent coating that can be sprayed on concrete, ceramic, metal, and wood surfaces. The team is using its funds to supply larger volumes for industrial trials and conduct a long-term field stability study.

FREYJA LLC
AKKENEEL TALSMA

Dr. AkkeNeel Talsma and Freyja LLC's MaternityMetrix web app support healthy pregnancies, births, and early infant care by putting clinically approved guidance at the fingertips of expectant families and caregivers. The team is using the funds for pilot testing with care workers, marketing, and tech upgrades.

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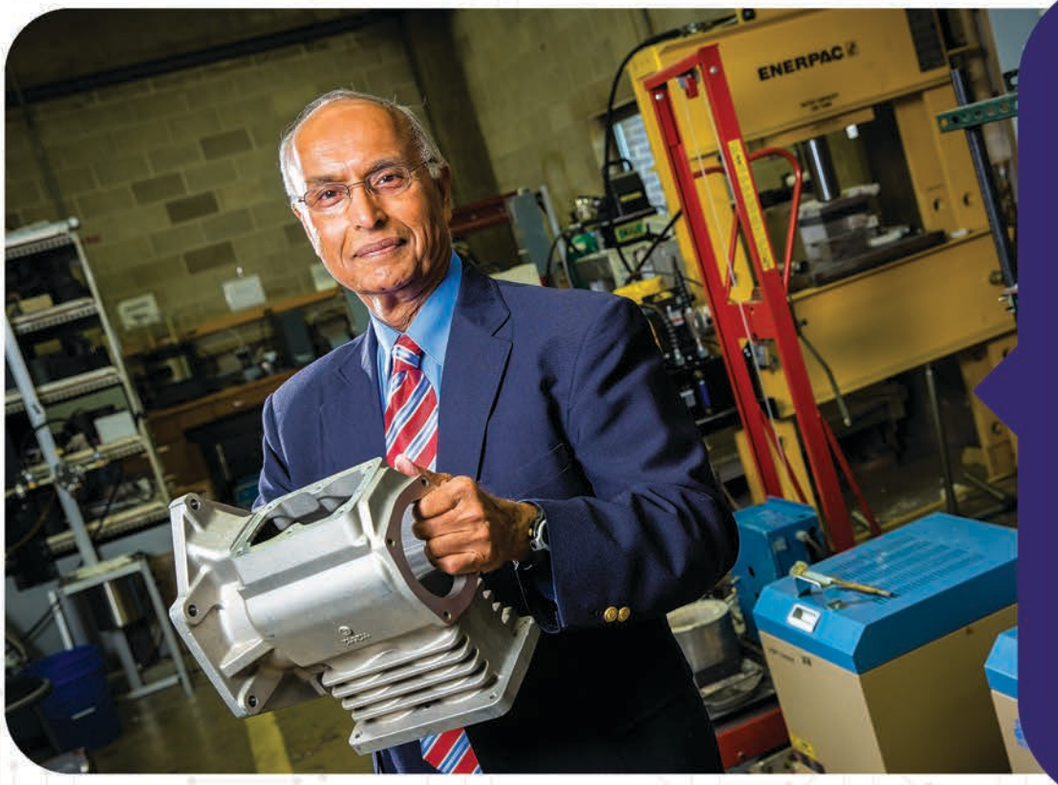

INTELLIGENT COMPOSITES LLC
PRADEEP ROHATGI

Dr. Pradeep Rohatgi and Intelligent Composites LLC are developing metal matrix composites that make aluminum stronger. Among other applications, this could extend the range of drones and improve internal combustion engines. The team is testing their composites and is using funds to fabricate liners and pistons for military testing.

NANOAFFIX SCIENCE LLC
JUNHONG CHEN

NanoAffix, founded by former UWM professor Dr. Junhong Chen, is developing a handheld device to test for lead and harmful compounds in drinking water. The company is using the Bridge Grant for manufacturing, marketing, customer outreach and business development.

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STARTUP NEWS

T3 BioScience developed a versatile and naturally derived agricultural product that can protect nine common crops from 11 diseases as effectively as current products but without being an antibiotic. Unlike current products, RejuAgro won't lead to antibiotic-resistant bacteria living on our fruit, making it a superior product. T3 BioScience has begun EPA-required environmental and toxicological testing to get RejuAgro submitted for approval in 2024.

T3BIOSCIENCE
Innovation and Science

TCARE

Caring for a loved one presents challenges, impacting the caregiver emotionally, physically, mentally, and financially. TCARE, an evidence-based program, combats caregiver burnout through personalized care plans that connects families to resources for stress reduction. In 2023, TCARE expanded into several states, initiated a Veterans support program in collaboration with Disabled American Veterans, and launched the nation's first caregiver insurance product.

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COnovate

COnovate developed a remarkable advanced composite material, eCOphite, that allows lithium batteries to operate more safely, perform better, and charge faster. This year the company scaled up production for testing purposes and demonstrated that its patented material can be made from biological source materials, improving sustainability and making it more possible for a US company to compete with overseas producers that currently dominate the market.

After almost losing one of her patients in the ICU, Lindsey Roddy, RN, developed the patented SecureMove-TLC®, a wearable, single-use medical device designed to secure and manage medical tubes, lines, and cords, vastly improving IV medication safety and efficiency. To date RoddyMedical has raised more than $2M, has had two patents issued, and has passed all FDA standards for sales. The SecureMove-TLC was officially launched in 2022, and RoddyMedical now has customers in Wisconsin, Ohio, and California.

RoddyMedical

SecureMove-TLC™

Confidence in Safety & Mobility

RoddyMedical

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CATALYST GRANT PROGRAM

To grow new ideas, the Catalyst Grant Program seeds UWM research with commercial potential. In 2023, the foundation awarded its 16th round of the grants, which were supported by the Lynde and Harry Bradley Foundation and a new energy track sponsored by Clarios. Established in 2007, the program has helped projects to attract further investment.

109

TOTAL GRANTS AWARDED

$5.76m

TOTAL AMOUNT AWARDED

$38.3m

ADDITIONAL FUNDS OBTAINED BY AWARDEES

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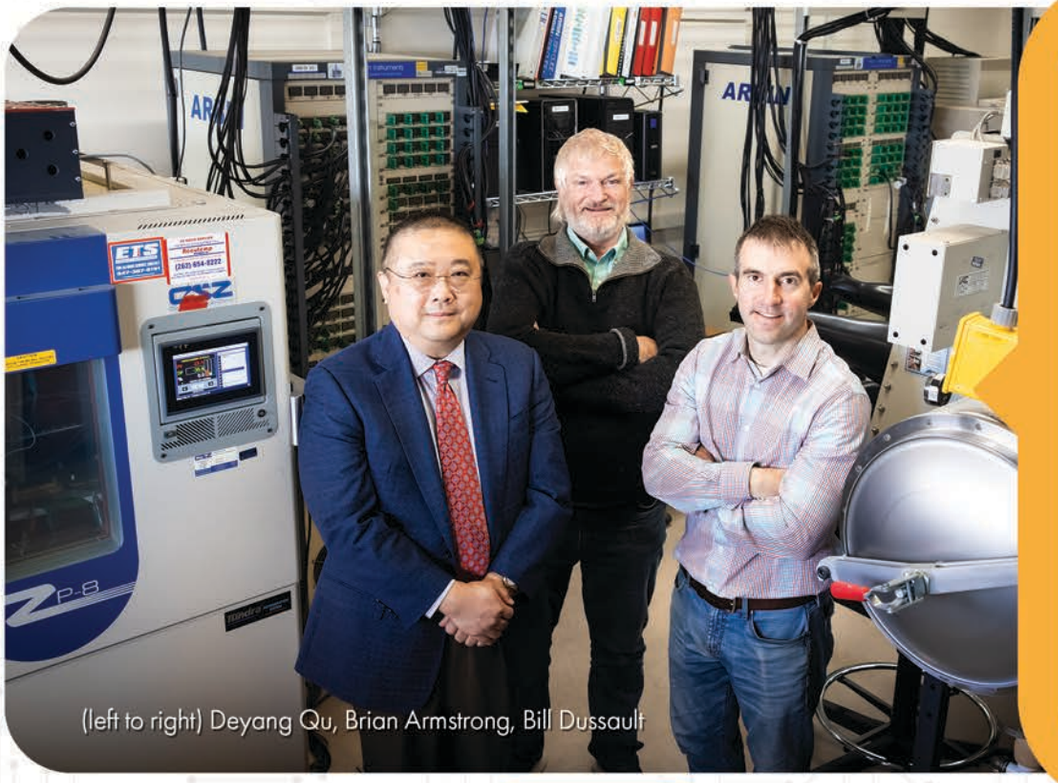

(left to right) Deyang Qu, Brian Armstrong, Bill Dussault

MAKING ELECTRIC VEHICLE BATTERIES SAFER

Drs. Brian Armstrong, Deyang Qu, and William Dussault are on a mission to make electric vehicle batteries safer. Their novel approach monitors the health of internal batteries, allows continued operation while bypassing faulty components and greatly reduces the size of batteries. This system could be used in aerospace, military, and next generation vehicles. The team is building a prototype to gather data needed for additional funding.

A ONE-TWO PUNCH AGAINST BREAST CANCER

Drs. Xiaohua Peng and Alexander Arnold are working to treat the most aggressive form of breast cancer by combining patented new anti-cancer compounds with high dose vitamin C. The lead compounds are 20-30 times more potent than a currently used cancer drug with the potential for fewer toxic side effects. The team is testing the therapy in mice, an essential step for attracting future pharmaceutical or startup partners.

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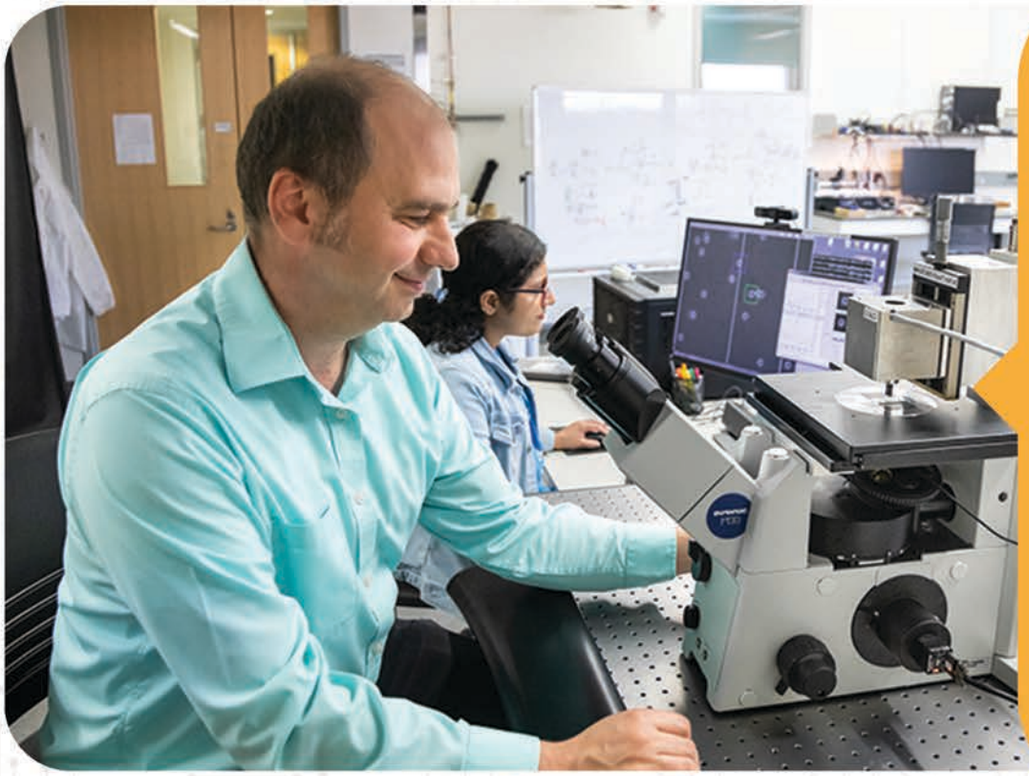

ANTIBODY CAPTURE MATERIAL FOR RESEARCH AND THERAPEUTICS

Dr. Ionel Popa has developed an efficient method of purifying antibodies that will significantly increase the yield for research in medical fields including immunology and oncology. Dr. Popa will use Catalyst Grant funds to conduct side-by-side tests against known competitors, test variations for specific research applications, and optimize the synthesis method to increase yields.

ACCESSING LITHIUM CLOSER TO HOME

This collaborative research team comprising Drs. Ying Wang, Xiaoli Ma, and Shangping Xu is developing a two-step process that extracts lithium from currently untapped sources. With this innovative technology, the United States could be a bigger player in meeting the exploding global demand for lithium. Grant funds will be used to test new materials for potential harvesting.

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WHY YOU SHOULD PARTNER WITH UWMRF

WE ARE:

- A top tier research institution
- World class faculty investigators and facilities
- Experienced catalysts for inventors
- A hub for intellectural property/copyrights

WE WILL:

- Provide expertise
- Provide R&D facilities & equipment
- Feed you talent
- Save you time and money

UWM Key Areas of Expertise:

Energy & Power Solutions

Infrastructure & Transportation

Water & Environment

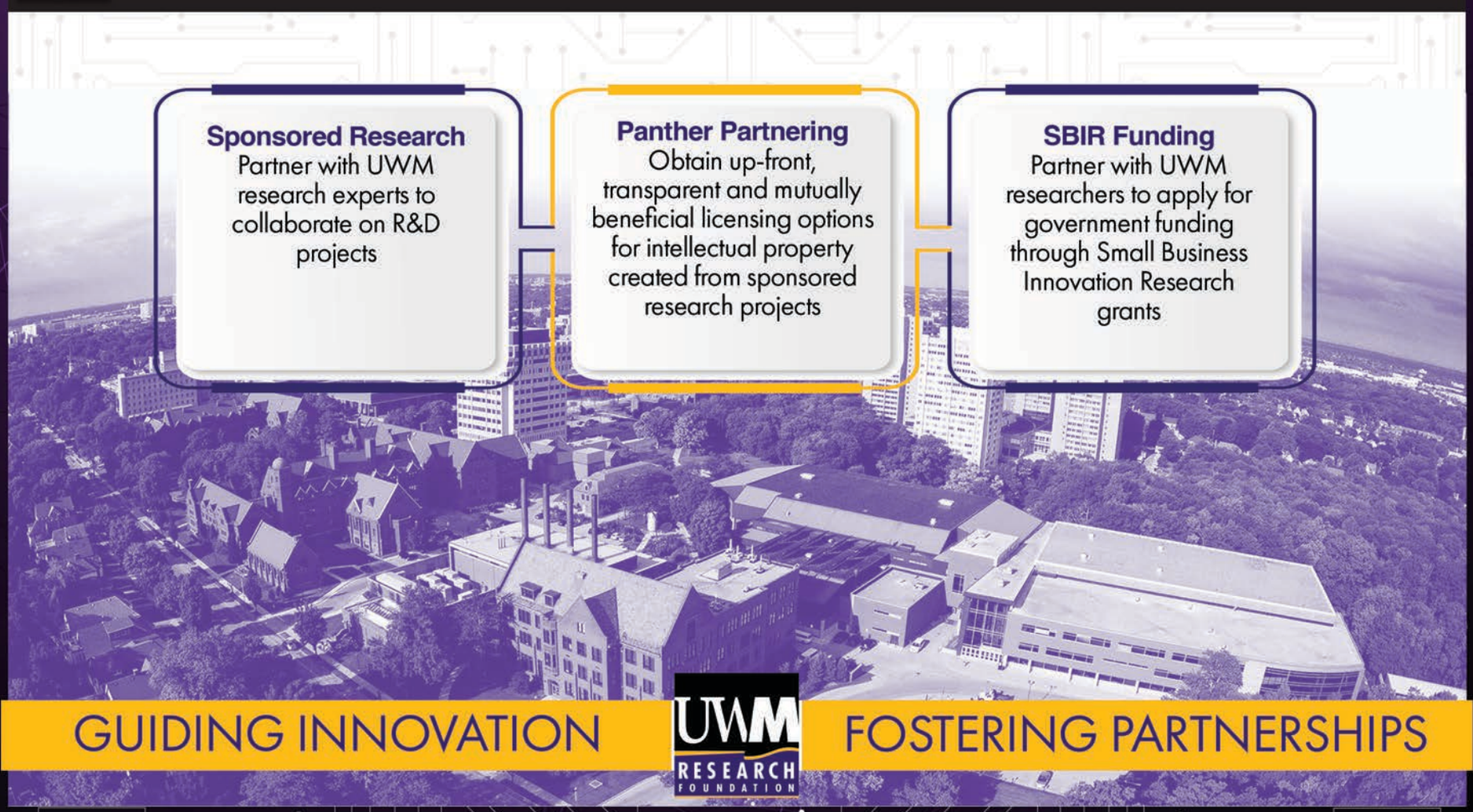
Manufacturing & Artificial Intelligence

Drug Discovery & Biomedical

Sponsored Research
Partner with UWM research experts to collaborate on R&D projects

Panther Partnering
Obtain up-front, transparent and mutually beneficial licensing options for intellectual property created from sponsored research projects

SBIR Funding
Partner with UWM researchers to apply for government funding through Small Business Innovation Research grants



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NEW TECHNOLOGIES

POWERING UP POWER SYSTEMS

Dr. Chanyeop Park is making waves with a patent-pending material that reduces aging and improves performance of electronic devices involved in energy infrastructure. In 2023 Dr. Park received more than $1.5M to find a similar solution for shipboard power systems.

ADVANCING LASER SCIENCE

Drs. Nikolai Kouklin and Konstantin Sobolev devised a novel process to fabricate a water-based semiconductor that could advance the science of lasers, light waves, and medical diagnostics by making their electronic components smaller, faster, and more reliable.

PUTTING INDEPENDENCE WITHIN REACH

Dr. Roger Smith and the HESTIA team have created a multi-faceted software tool designed to perform home evaluations and help provide customized solutions for people with disabilities and seniors who want to live independently and age in place.

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NEW STAFF MEMBERS STREAMLINE PROGRAMS AND EVENTS

Dena Foster joined UWMRF to coordinate the marketing of our many patented technologies. Dena shares UWMRF's exciting advances through LinkedIn, Facebook, and X (formerly Twitter), and provides updates through stakeholder communications and monthly newsletters. She brings valuable teaching, problem-solving, and technical writing expertise to the organization, greatly advancing our external communications and market research efforts.

UWM alum Robin Kroyer-Kubicek joined UWMRF in August of 2023 as the Events and Programs Coordinator. Before joining our team, Robin worked as a healthcare laboratory technologist and quality assurance specialist in pharmaceutical manufacturing and later taught high school science. She brings a wealth of experience from her roles at the Wisconsin Department of Workforce Development and Department of Public Instruction and as a Director of Research, where she coordinated a national State Leaders of Career Development network.

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NSF ENGINES AWARD IN SUSTAINABLE AGRICULTURE

Since 2019, Dr. Jessica Silvaggi has participated in a joint effort between the three technology commercialization offices that serve the Universities of Wisconsin. This project, named the Bicentennial Innovation Challenges (BIC), investigated major challenges facing our state. The team formed a winning proposal for a National Science Foundation (NSF) Engines Development Award for Advancing Sustainable Agriculture in Wisconsin. This two-year Phase I award of $1M offers the opportunity for a Phase II award of $160M over 10 years to establish Wisconsin as a hub for agricultural sustainability by strengthening research partnerships, improving workforce training, informing policy decisions, supporting startups, and advancing technology development and adoption.

Innovation collaboration across the Universities of Wisconsin

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LUBAR ENTREPRENEURSHIP CENTER NEWS

The Lubar Entrepreneurship Center continues its work as an innovation hub at UWM by offering a dynamic array of workshops, pop-ups, and engaging events designed to immerse both students and faculty in the world of entrepreneurship. Through these initiatives, the Center fosters a collaborative ecosystem that empowers the university community to explore, test and embrace the entrepreneurial mindset.

4009
ENGAGEMENTS TO DATE

55
POP-UPS

25
CAMPUS CONNECTIONS

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STARTUP CHALLENGE

The Startup Challenge, LEC's longest running program, is now in its 12th year. The program offers workshops for emerging startups and, for the first time, will be offered to students as a credit-earning course in 2024. Core to the LEC is Design Thinking that embraces customer values, finding testable hypothesis and seizing opportunities. The Startup Challenge offers ways to apply these principles to life and teaches students how to think proactively and navigate challenges within entrepreneurship.

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The LEC advances students' understanding of entrepreneurship by cultivating meaningful connections with community partners. The LEC has forged partnerships with local businesses, industry leaders, and trailblazers that extend beyond the classroom, allowing students to engage with real-world entrepreneurs, gain insights into diverse industries, and witness practical application of entrepreneurial principles. With support from the Baird Fresh Ideas fund, the LEC has established 25 relationships with community partners and is able to equip students with a valuable support system as they embark on their own entrepreneurial journey.

NEWLY RENAMED NICHOLAS INNOVATION COMMONS SERVES AS THE CONNECTION POINT FOR LEC-HOSTED EVENTS.

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MILWAUKEE I-CORPS

The Milwaukee I-Corps Program is now in its 8th year under the guidance of Dr. Ilya Avdeev and is part of the Great Lakes I-Corps Hub. In 2023, the program guided 30 teams through the intricacies of customer discovery and market research, fostering entrepreneurship and strategic thinking. The Program supports not only UWM, but other academic institutions including the Medical College of Wisconsin, Marquette University, the Milwaukee School of Engineering, and Concordia University.

Additionally, the I-Corps program partnered with the UWMRF to host workshops to help aspiring innovators strengthen their Catalyst Grant proposals by conducting interviews to assess their research ideas with potential real-world customers.

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LEC ANNOUNCED NEW DIRECTOR ILYA AVDEEV

Dr. Ilya Avdeev first joined UWM's Mechanical Engineering Department in 2009, where he led multiple sponsored research projects and secured more than $1.6M in research funding for the Department's Advanced Manufacturing and Design Lab. In 2012, Dr. Avdeev co-founded the UWM Startup Challenge and what is now the NSF I-Corps Hub of the Great Lakes Region.

Dr. Avdeev has served as Director of Innovation and Associate Director of the Lubar Entrepreneurship Center since 2018, spearheading the development of foundational innovation curriculum and human-centered design at UWM. As Director, he will continue leading innovation and discovery for entrepreneurs, researchers, and communities through programs provided by the LEC.

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LEC SCHOLARSHIPS

Through support from their donors, since its inception, the Lubar Entrepreneurship Center has allocated $92,700 in scholarships and pitch competition awards, alleviating the financial burden on students and encouraging them to pursue their innovative ideas with confidence. These funds also open doors to additional opportunities.

With support from the Lubar Entrepreneurship Center, members of the student organization, Collegiate Entrepreneurs Organization (CEO) were able to participate in the 40th Global Conference & Pitch Competition in Tampa, Florida.

"Our interactions with the Lubar Entrepreneurship Center have been nothing short of transformative, inspiring us to embark on a journey to start our own business and providing the guidance necessary to scale, achieve milestones, and explore the possibilities we didn't know were within reach - especially for college students."

- CEO President, Kayla Lokker

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THANK YOU TO OUR DONORS!

The UWMRF is grateful to all of our individual donors, board members, and foundations whose gifts and grants have helped to support the mission of guiding innovation and fostering partnerships to advance ideas to commercialization. Thank you to the Bradley Foundation, Bader Philanthropies, Clarios, Schoenleber Foundation, Alvin & Marion Birnschein Foundation, Marjorie Siebert Aylen Foundation, Holz Foundation, Chris & Tessa Myers, and Dennis & Sue Webb.

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Attorney & Shareholder, Lichtsinn & Haensel, S.C.

Dennis Webb
Engineer & President, Sage Water

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Erin Puro, Brian Walsh,
Jessica Silvaggi (l to r)

THE UWM RESEARCH FOUNDATION THANKS YOU

I extend a sincere thank you to the UWM faculty, students, and colleagues who have supported me in my fourteen years at the UWMRF. I couldn't have picked a more perfect job at the interface of science, research, innovation, and helping bring new products and services to mankind. We have an amazing team at the UWMRF here to serve you in your journey from idea to commercialization. Without your drive, perseverance, and expertise we would not have made such significant strides in commercialization at UWM. I am excited and passionate about leading the UWMRF as the new president and we look forward to serving you as you advance your ideas and services to the marketplace.

Jessica Silvaggi, PhD
UWMRF President

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