



MSU INNOVATION CENTER

2024 ANNUAL REPORT

Dear Innovators, Collaborators, and Friends of MSU,

The MSU Innovation Center works at the intersection of university research & creativity with the private sector, translating ideas into solutions that serve the public good, generate new economic opportunities, and redefine industries.

In 2024, we celebrated numerous milestones that underscore our commitment to uniting researchers, entrepreneurs, students, and industry leaders to address some of society's most pressing challenges.

Collaboration remains at the heart of our work. In 2024, we deepened partnerships with many industry leaders, resulting in more than \$25 million in corporate-supported programs at MSU. These alliances provide faculty with insights informed by the real-world challenges that corporations are grappling with in their product development. In this Annual Report, we highlight one such partnership between AGC Vinythai, allnex, and MSU, where those companies provide our faculty innovators with insight, as well as essential sources of raw materials and industry feedback to ensure the technology MSU develops is both effective and economically viable.

This year also saw continued success in economic development through entrepreneurship. From startup companies like Earthmetric, who are utilizing technologies developed at MSU for sustainable agriculture, to Redoxblox, whose MSU-developed clean energy innovation hopes to spark a green energy revolution, MSU researchers have demonstrated the power innovation has when it leaves the lab and enters the world of product development and sales.

This annual report highlights only a fraction of the past year's achievements, offering a glimpse into the stories and successes that make the MSU Innovation Center a cornerstone of progress. It also outlines our vision for the future, where we aim to expand our impact, embrace new opportunities, and continue to empower Spartans to lead the way in innovation.

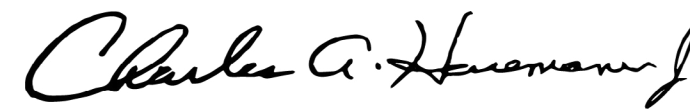
This year's achievements were possible because of the talented and dedicated individuals who make up the MSU Innovation Center. Through these efforts, the Innovation Center has expanded our corporate partner landscape, secured new patents, accomplished technology transfer, and launched entrepreneurial ventures that are already impacting the market.

I am continually inspired by our researchers, who approach every challenge with curiosity and resolve, and by our students, whose creativity and determination know no bounds. I am equally grateful for our industry partners, alums, and supporters who share our vision for a more innovative and impactful future.

As we look to 2025 and beyond, our mission remains clear: to amplify the impact of MSU's research and creativity, foster economic growth, and contribute to a better world. We are committed to scaling our efforts, embracing bold ideas, and ensuring that our work reflects the values of innovation, integrity, and inclusivity that define MSU.

Thank you for being a vital part of this journey. I invite you to explore this report and celebrate the milestones we have achieved together in 2024.

With gratitude and anticipation for what lies ahead,



CHARLES A. HASEMANN, PHD
Associate VP for Innovation & Economic Development





Unlocking Nature's Secret: The Lignin Revolution

BY KEITH ROUSE

A quiet revolution is taking place in bustling laboratories. Dr. Mojgan Nejad, an Associate Professor at MSU with a joint appointment in the Department of Forestry and Department of Chemical Engineering and Material Sciences, is leading a team that's turning what was once considered waste into a valuable resource that could transform multiple industries.

The hero of this story? Lignin - a complex organic polymer found in the cell walls of many plants that form key structural materials in their support tissues, allowing plants to grow tall and strong.

"Lignin is the second most abundant natural polymer on Earth, after cellulose," explains Dr. Nejad. "It comprises almost one-third of a plant's dry mass and provides structural support, impermeability, and resistance against microbial attack and oxidative stress."

For years, lignin has been seen as little more than a waste product, often burned as low-value fuel in paper mills and biorefineries. But Dr. Nejad and her team are changing that perception, unveiling its potential beyond fuel applications one step at a time. Her group has made significant strides in this area, resulting in

numerous patents and collaborative partnerships with industry giants such as AGC Vinythai and allnex, further accelerating these developments.

Lignin's properties make it suitable for various applications, including as a biofuel, biodegradable plastic, eco-friendly packaging material, or even as an additive to concrete to improve strength and reduce environmental impact. Its inherent properties, such as antibacterial and microbial resistance, fire retardant, antioxidant properties, add to its versatility.

"Lignin has potential for so many applications," says Dr. Nejad. "We're replacing polyol, phenol, and bisphenol A with technical lignins in polyurethane, phenolic, and epoxy resin formulations, which are used to make bio-based adhesives, coatings, foams, and composites."

One of the most promising applications is bio-based resins and coatings, which could positively impact numerous industries.

The benefits of bio-based epoxy resins and coatings are manifold, including being safer for the environment and human health. Current bio-based options often face limitations due to their performance and cost.

"Many researchers have previously focused on using vegetable oils, tannins, and fractionated lignins. However, the wide availability of lignin makes the use of unfractionated technical lignin more interesting for many scientists and industries," explains Dr. Nejad.

Dr. Nejad's team is pioneering the use of unmodified, commercially available lignins to replace bisphenol A (BPA) in epoxy resin formulations.

"BPA is known to be an endocrine disruptor and is banned in baby bottles and canned baby foods," Dr. Nejad says. By developing a lignin-based epoxy resin, Dr. Nejad hopes to eliminate the use of BPA and create more sustainable and safer coatings, which could have far-reaching implications for industries ranging from automotive and aerospace to packaging and construction.

The secret to utilizing lignin as a safe, natural replacement for BPA is due to the inherent phenolic structure of lignin.

"If you look at BPA, it's a compound, which contains two phenolic hydroxyl groups," explains Dr. Nejad. "And if you compare that to the structure of lignin, you will see that lignin inherently has several phenolic hydroxyl groups. We don't need to modify lignin to replace BPA; those structures exist naturally in lignin."

One key to unlocking lignin as a source for bio-based coatings is choosing the right source. The properties of lignin can vary depending on the plant it is derived from and the process used to isolate it from other biomass components.

“ The structure of lignin significantly varies based on the biomass source. The structure is different, whether it comes from softwoods, hardwoods, or agricultural residue.”



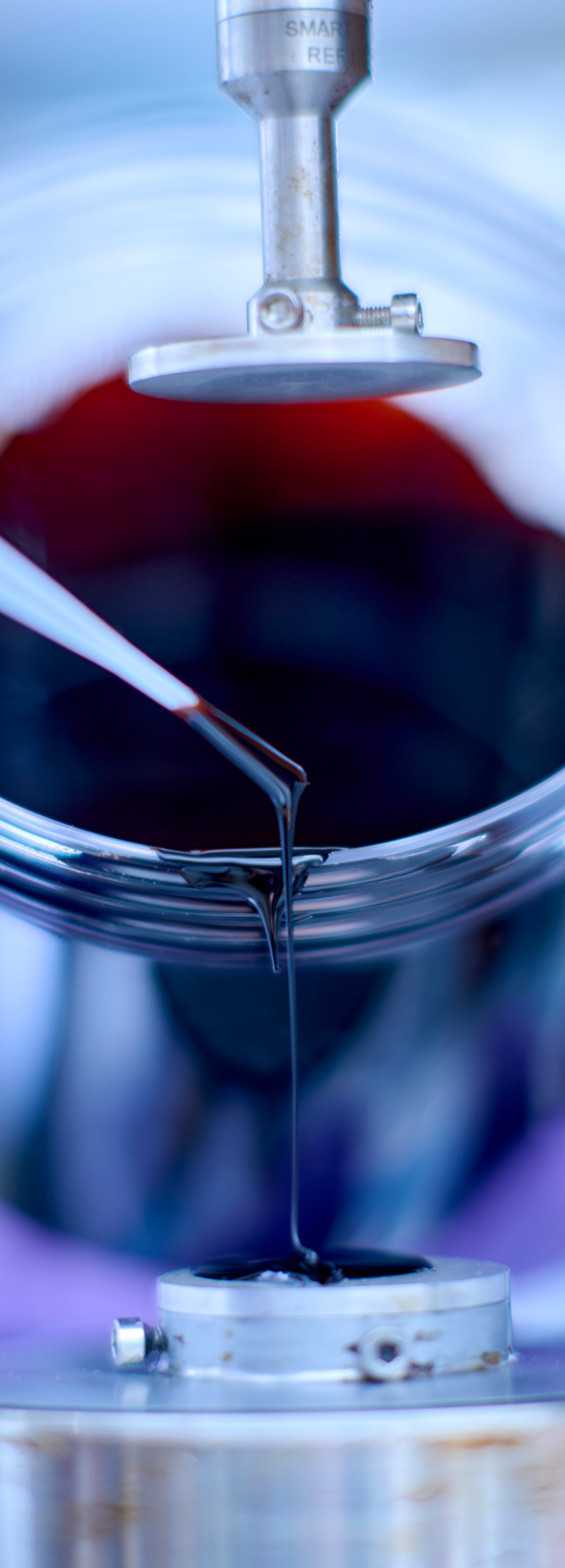
"The structure of lignin significantly varies based on the biomass source. The structure is different, whether it comes from softwoods, hardwoods, or agricultural residue," says Dr. Nejad. "It's not only that, but the process used to isolate lignin from the plant also affects its properties. We currently have over 80 different lignin samples from all over the world. We have characterized them by measuring their chemical, physical, and thermal properties, and based on these measured properties, we can predict which lignin is good for what application."

The potential of this technology has not gone unnoticed. AGC Vinythai, a company producing bio-based epichlorohydrin, and allnex, a global leader in industrial resins, have partnered with MSU to develop and scale up the production of lignin-based epoxy resins.

Mr. Masayoshi Namba, Business Director at AGC Vinythai, said, "Innovation and sustainability are key values for AGC Vinythai, and EPINITY® is a leading example in our product portfolio. By working with partners, we are continuously improving the sustainability of our products."

DR. MOJGAN NEJAD





Creating a Research Partnership

Business Connect, MSU's corporate engagement office and part of MSU's Innovation Center, plays a crucial role in fostering these types of collaborations between academia and industry. The benefits of such collaborations include accelerated innovation, enhanced problem-solving capabilities, and increased potential for commercial applications. Over the years, Business Connect has facilitated numerous collaborations between industry and Dr. Nejad. Industry partners like AGC Vinythai, allnex and others contribute significantly to research like that of Dr. Nejad and her team, bringing valuable insights and resources to the table.

"This was an especially complex negotiation" stated Jeff Myers, Director of Corporate Partnerships for Business Connect. "It involved three organizations and several pieces of intellectual property. Our office worked closely with Tom Herlache at MSU Technologies to successfully negotiate the agreements to help move this partnership forward."

"Engaging with industry partners is an important part of the innovation process and can contribute crucial aspects to accelerating research," says Myers. "This includes resources such as funding and raw materials while also providing direct feedback on the results and tests needed to determine how the process can be changed or adapted for industry needs to ensure the technology is effective and economically viable."

"Research partnerships such as this are likely to result in meaningful commercial outcomes benefitting the partners," says Tom Herlache, Senior Technology Manager at MSU Technologies. "In this particular case, much more sustainable 'green' industrial and consumer products could be the ultimate outcome," Herlache adds.

"Other groups end up adding so many steps, chemicals, and costs to fractionate lignin that, in the end, the bio-based coating is not economically feasible. Or when they attempt to develop a bio-based BPA replacement that ends up with no reduction in toxicity because now they're making similar molecules to those toxic petrochemicals," says Dr. Nejad.



However, Dr. Nejad's team has unique expertise in using unmodified lignin to meet industry needs. She believes that by working closely with industry partners, her team will be able to develop processes to utilize lignin in bio-based coatings that are scalable and economically viable—using industrially relevant reaction times, temperatures, and catalysts to make resins and coatings that incorporate a sustainable, abundant resource.

Florian Lunzer, Director of Strategic Research at allnex, said, "As a leader of industrial coating resins, allnex focuses on innovative chemistry to meet the needs of our customers and advance sustainability. We are pleased to collaborate with MSU and AGC Vinythai to bring lower carbon footprint and Bisphenol A-free epoxy solutions to the markets we serve."

“ Seeing our inventions make a real-world impact. It's an amazing experience to be so close to seeing our technology used in the next generation of sustainable vehicles or safer earth-friendly food packaging.”

Dr. Nejad's current project with industry partners AGC Vinythai and allnex, set to run until October 2026, represents a significant step towards 100% bio-based coatings. It's a testament to the power of collaboration between academia and industry, bringing together MSU's research expertise with the industrial know-how of AGC Vinythai and allnex.

"We are thrilled to share this exciting collaboration," says Dr. Nejad. "By completely replacing Bisphenol A with technical lignins and using bio-based epichlorohydrin from AGC Vinythai, we're paving the way for greener, more sustainable coatings."

As the world grapples with the need for more sustainable materials, Dr. Nejad's work offers a glimpse of a greener future. From the cars we drive to the packaging that wraps our food, lignin-based materials could soon be a part of our everyday lives, turning a widely available, underutilized material into high-value products.

As the project progresses, Dr. Nejad and her team continue to unlock the potential of lignin, creating new materials and helping to craft a more sustainable future for us all.

The importance of lignin's versatility in various industries as a sustainable alternative cannot be overstated. As the world grapples with environmental challenges, these solutions promise a more sustainable future.

"This is the main motivation for my work," Dr. Nejad concludes. "Seeing our inventions make a real-world impact. It's an amazing experience to be so close to seeing our technology used in the next generation of sustainable vehicles or safer earth-friendly food packaging."

Earthmetric: Revolutionizing Farming Through Technology and Sustainability

BY KEITH ROUSE



The origin of EarthMetric Innovation's Bluewise System is in the fields of farmers. "Engineers develop tangible solutions to what society needs.

I guess that was kind of always my motto for my career," says Younsuk Dong, Ph.D., EarthMetric co-founder and Assistant Professor of Biosystems and Agricultural Engineering at Michigan State University's (MSU) College of Engineering. Dong has spent countless hours engaging with producers and growers to understand the growing challenges that climate change and an increasing focus on sustainable water management has had on farmers. "The motivation for this technology was the farmers themselves," Dong explains. "They told us what they needed, and we set out to create it."

The idea behind the Bluewise system is simple: provide growers with real-time, continuous monitoring of soil moisture, leaf wetness, field temperature, and humidity with data collected at the field level. Based on technology developed at MSU in 2020 called LOCOMOS (Low-Cost Monitoring System) with Dr. Dong and colleagues Steve Miller and Lyndon Kelley, the technology aimed to help farmers determine optimal crop watering patterns, deciding when crops need water and how much water to use. Combining advanced sensors, machine learning algorithms, and hyper-local weather data, LOCOMOS was developed to help growers optimize their irrigation and crop management practices, ultimately reducing water waste and the use of harmful chemicals.

"We realized that LOCOMOS was already showing utility on farms growing corn and soybeans and recognized the broader potential for a range of fruits and vegetables across the United States," explained Jon Debling, Technology Manager at MSU Technologies.

Dong admits that commercializing his technology wasn't something he had ever considered. However, after hearing the overwhelmingly positive feedback from growers, Dong realized that commercialization of the LOCOMOS technology would be the best avenue to get his solution into the hands of the growers who need it most.

"A key step in commercializing the technology was recognizing what technical work was required to bring the LOCOMOS technology closer to a viable product.

We identified the steps needed and worked towards developing a more commercially ready prototype," said Debling.

With the assistance of the MSU Innovation Center, Dong was able to leverage the extensive network of resources available to faculty inventors through MSU's Innovation Ecosystem. Utilizing translational research funding from the Michigan Translational Research and Commercialization (MTRAC) program, supported by the Michigan Economic Development Corporation (MEDC), Dong was able to develop an app in collaboration with Dr. Zhichao Cao in Computer Science and Engineering at MSU that allows users to check moisture conditions, see recommended watering and pesticide spray timings, and make watering decisions from a grower's smartphone.

“Engineers develop some tangible solutions to what society needs. I guess that was kind of always my motto for my career.”

"The development of the Bluewise technology illustrates how MTRAC AgBio funding can catalyze the successful commercialization of technology developed by university researchers across the state," says Joe Affholter, Commercialization Program Director for the MTRAC AgBio Innovation Hub at the MSU Innovation Center. "In this case, Dr. Dong and his colleagues used an initial tranche of MTRAC AgBio funding to conduct exploratory trials with farmers using an early version of the technology and then used a larger, second tranche to develop a field prototype that was responsive to the needs their customers expressed. That prototype has now led to the development of an industry altering product and the launch of a new business. The team has done a marvelous job stewarding the funds and meeting a real need through well-targeted innovation."

Dong also received additional funds through the MSU Targeted Support Grants for Technology Development program (TSGTD) to develop electronic diagrams for prototype hardware.

Support from translational grants such as MTRAC and TSGTD provided Dong's team with the necessary



• **MATT HENRY**
EARTHMETRIC FOUNDER & CEO



• **YOUNSUK DONG**
EARTHMETRIC FOUNDER & CTO

funding to move LOCOMOS from the lab to becoming a real-world commercial product. “Many other research grants do not allow you to spend funding on developing circuit boards. There are not many grants out there that do. MTRAC helped us with funding for prototype development, which was really helpful,” says Dong.

MSU’s Innovation Ecosystem Provides Crucial Startup Resources

MSU Technologies, working in partnership with the MSU Research Foundation’s venture creation entity, Spartan Innovations, continued to work closely with Dong through the initial stage of startup formation. With assistance from the NSF Regional and National I-Corps programs, Dong’s team interviewed more than 100 farmers to further explore the market potential for the LOCOMOS technology and begin forming a business plan.

“Understanding how technology solves problems in the market is critical to starting a business,” says Brad Fingland, Director of Venture Creation at the MSU Research Foundation. “The support of the Foundation, the Innovation Center, and the NSF I-Corps program helped guide EarthMetric to a commercially viable product.”

The MSU Research Foundation also paired Dong with Mentor-in-Residence (MIR) Matt Rudd, who served as a business consultant for the fledgling startup. Rudd reached out to Matt Henry, who had 25 years of experience in manufacturing and 3D printing, to assist with bringing LOCOMOS to market.

Henry quickly hit it off with Dong and discovered they both shared a passion for the LOCOMOS technology’s ability to make a positive impact on climate change and agriculture. “After just two weeks of starting my consulting with them and trying to get the business up and running, we were discussing the need to find a CEO and founder, and I said, ‘What about me?’” Henry recounts.

With Henry now at the helm as CEO, the MSU Research Foundation continued to provide assistance and support to the team as they prepared to enter the market by providing the first pre-seed investment through its venture investment subsidiary, Red Cedar Ventures.

“The Foundation provides a lot of different areas to support. When I have questions or need extra resources, they have a network of people in all different areas that can help me and give me some guidance or introduce me to somebody else,” says Henry.

With the final pieces in place, the startup was ready to launch. In 2023, EarthMetric was founded to help people and the environment. Based on the LOCOMOS technology, now called Bluewise, EarthMetric wants to see its platform in fields across the US and globally to increase crop yield, reduce chemical use, and sustainably manage water use.

“We were able to move from incorporating a company to market in six months. Even coming from a pre-existing company going from prototype to commercial product in six months would be pretty phenomenal.

“The Foundation provides a lot of different areas to support. When I have questions or need extra resources, they have a network of people in all different areas that can help me and give me some guidance or introduce me to somebody else.”

But we weren’t taking a variant of another product and saying we have a new product. This was going from idea to startup in just six months. I think that’s been a testament to MSU Technology’s help with the development of Yoonsuk’s technology and to what the Foundation laid out for us, from their processes and the support they gave us,” says Henry.

Since its launch, Bluewise has been met with enthusiasm from growers, with more than 80 units in the field. Some of Bluewise’s success is due to its low cost compared to other competing technologies.

“So many of our competitors are much higher cost, which often prices those technologies out of reach of many farmers since farming can be a low margin, high volume business. So, farmers are watching every penny, and they want to see a quick return on investment,” explains Henry.

Helping Growers Save Water and Save the Environment

The Bluewise system helps farmers save money by helping to reduce water and chemical usage. “I think this is where the technology really shines,” says Dong. He continues, “Farmers always wonder how much rain they receive to determine whether the leaves are dry enough for fungicide or pesticide application. And if they get some rain, they want to be able to factor that rain amount into their irrigation management plan. Bluewise is more of an all-in-one technology that helps irrigation and other farm management practices



like fungicide application timing. There are other technologies that can do irrigation, but Bluewise can do both irrigation and fungicide application management and provide a measurement of all the other pertinent weather data on an individual field level.”

“Other systems track weather, but they don’t do it to the same level that we’re doing it, right there on each unit in the field. Some competing solutions are not even using weather stations; they’re tapping into weather networks,” adds Henry. “But what’s more is that we’re also analyzing the data, providing farmers answers and we’re presenting it in a format that is easily readable for them. Now they can glance at their phone through our app and see actionable recommendations instead of trying to interpret what the raw data is saying.”

Both Dong and Henry are looking forward to the prospect of making a difference through EarthMetric. “We’re more than just an agricultural company. That’s why the name is EarthMetric. It’s all about what we can do that’s associated with the climate, helping with climate change, helping with the environment, everything from agriculture through the environmental stages of the earth. By reducing fungicide and fertilizer usage and optimizing those with sustainable water use, you’re making a better environment for everybody. Also, by increasing the crop yield or the output per acre, we can help growers produce more food from a global food supply chain. Saving the planet, feeding the people,” says Henry.



MSU Startup of the Year Drives Transition to Sustainable Energy Solutions

BY LYNN WALDSMITH & KEITH ROUSE

A new, fast-growing company based on Michigan State University (MSU) technology is tackling the urgent need for sustainable energy and grid reliability. RedoxBlox, recently named the 2024 MSU Startup of the Year, is leading the way in energy storage technology, creating groundbreaking solutions for power generation and industrial heat applications.

RedoxBlox's innovative technology was developed by MSU Research Foundation Professor James F. Klausner, Ph.D., and his team. It harnesses excess renewable electricity or generated heat, storing it efficiently and releasing it as high-temperature air or electricity when needed.

"To decarbonize is the major driving impetus for our technology and why we exist as a company," said Klausner, co-founder and executive chairman of RedoxBlox. "We're targeting industrial heat and grid storage. If we decarbonize both those industries, that addresses about half of all carbon emissions worldwide, so that has a huge impact. But we do not rely on the goodwill of others wanting to decarbonize. We rely on being competitive against natural gas. We rely on a good business proposition to decarbonize."

Renewable sources such as solar, wind, and hydropower provide clean alternatives to fossil fuels but are often intermittent, presenting a challenge for consistent energy supply. RedoxBlox's technology addresses this limitation, expanding renewable energy's potential, enhancing grid stability, and fostering a more resilient energy infrastructure.

The RedoxBlox storage module is a marvel of engineering, using metal oxide-based storage modules that are non-toxic, non-flammable, and fully recyclable. Through both conventional simple heat and a reversible chemical reaction, the system converts electricity to heat and stores it. The storage modules reach temperatures up to 1500°C, emulating the output of a natural gas combustor.

“Decarbonization has to be a natural side effect of utilizing cost-competitive technologies to meet the world's energy needs.”

The technology allows for retrofitting existing equipment that burns natural gas, enabling users to switch to renewable energy stored in the RedoxBlox system.

"Decarbonization has to be a natural side effect of utilizing cost-competitive technologies to meet the world's energy needs," said RedoxBlox CEO Pasquale Romano.

The innovation lies in a reversible redox cycle, a breakthrough researchers have pursued for decades. "People have been working on trying to make redox cycles reversible for half a century, and the team from MSU solved that for the class of materials that we utilize," Romano said. "It is the next best thing to being able to reverse the process of burning fossil fuels. We like to call it 'reversible combustion.'"

MSU Technologies Moves Groundbreaking Technology from the Lab to the Marketplace

The metal oxide core material that powers RedoxBlox's technology was first discovered in 2018 when Klausner was at the University of Florida. Later, with support from MSU's College of Engineering and government grants, Klausner brought his team to Michigan State University, where they continued developing the technology.



PASQUALE ROMANO
REDOXBLOX CEO



JAMES KLAUSNER
REDOXBLOX CO-FOUNDER
& EXECUTIVE CHAIRMAN

Recognizing the commercial potential of this discovery, the company recruited Romano, an experienced entrepreneur in clean technology, to lead the company's commercialization in 2024. RedoxBlox benefited from MSU's entrepreneurial ecosystem, including support from Spartan Innovations, a subsidiary of the MSU Research Foundation, which provided talent connections, campus space, and seed funding.

"We had Ph.D. students and postdocs who worked on the research who eventually became co-founders. The core talent for the technology came out of MSU. This business is also very capital-intensive and could not have been created without significant venture capital funding," said Klausner.



In 2020, RedoxBlox embarked on a multi-million-dollar seed funding round. Red Cedar Ventures, an early-stage investment subsidiary of the MSU Research Foundation, became a primary investor.

“We were one of the first investors, and we’ve made multiple investments in RedoxBlox over the last few years,” said Jeff Wesley, Executive Director of Ventures at the MSU Research Foundation. “So that says a lot for our support of them and what they’re doing because we don’t do that with everyone. The company has also done a fabulous job of getting non-dilutive capital,” he added, “which is mostly grants on their way to commercialization. You don’t always see that with startups. This is a company that’s on a really good trajectory.”

Now headquartered in San Diego, RedoxBlox is set to make a significant impact in the energy sector.

“The MSU Research Foundation is great to work with,” Klausner said. “Their resources and willingness to support our team has definitely made life easier in terms of getting things started. It’s nice to have a friendly investor-partner in your corner.”

“ People have been working on trying to make redox cycles reversible for half a century, and the team from MSU solved that for the class of materials that we utilize.”

Bringing Renewable Energy Solutions to Market

For its heat applications, RedoxBlox is targeting heavy industries such as chemicals, steel, cement, and food and beverage. It aims to provide storage solutions for the grid by partnering with utility companies and large energy consumers.

“To put things in perspective, an industrial boiler demands about a megawatt of thermal energy,” Klausner explained. “To get into the industrial heat market, we can have a unit the size of 20-megawatt hours to give a good quantity of energy storage. To get into the electric power market, we probably need on the order of gigawatt hours. It takes power plant-size storage to get into that market. Industrial heat is likely to be the first scale market for the technology, with long-duration grid-scale storage applications following.”

Dow Chemical Company is RedoxBlox’s first major customer. As part of a Department of Energy demonstration project, a 20-megawatt-hour unit is slated for installation at Dow’s West Virginia chemical plant.

“One of the biggest challenges is just the time it takes to develop large-scale physical things,” Romano noted. “Silicon Valley investors are biased to software companies where all you need is a few pizzas and some laptops. What we do is much more capital-intensive and takes much more time to get to a minimum viable product. When you start a company like RedoxBlox, you start a time clock. That really is our biggest challenge, time.”

Despite these challenges, the investment community remains optimistic about RedoxBlox and its mission to drive renewable energy adoption. “When you have venture groups coming in who are interested in a startup in the very early stages, they know it’s a risk, but if they feel the potential reward is higher than the risk, then they’re willing to take it,” said Anne DiSante, Executive Director of MSU Technologies. “We’re really excited about their future.”



redoxblox

Jogi Katende and Duy Nguyen Named 2024 James Ian Gray Scholars in Entrepreneurial Studies

BY ERIN TIMMERMAN

Jogi Katende and Duy Nguyen are far from being average college students. While they are committed to the success of their academic studies, they are also the co-founders of an innovative startup venture, Apprese. This commitment to their business partnership, their shared entrepreneurial mindset, and their vision for Apprese's success is why they are 2024's James Ian Gray Scholars in Entrepreneurial Studies.

Katende is a junior within the Broad College of Business, the College of Social Science, and the Honors College, pursuing a dual degree in Finance and Economics, supplemented by minors in Entrepreneurship and Innovation and Quantitative Data Analytics. Meanwhile, Nguyen, also a junior, is affiliated with the Broad College of Business and the Honors College, majoring in Supply Chain Management with double minors in Entrepreneurship and Innovation and Real Estate. Their collaborative success exemplifies the fusion of academic excellence and entrepreneurial ambition.

Katende grew up on a rural farm in Uganda, East Africa. He attended school in Kampala, Uganda's capital city. Nearly 7,500 miles away from family, Katende has made MSU feel like home, becoming involved in as many campus activities beyond the Burgess Institute.

"In my spare time at MSU, I am a member of the Uganda National Taekwondo Team and the MSU Taekwondo Team. I am also an avid researcher who recently presented at the National Conference for

Undergraduate Research in California. Subsequently, I am also a resident assistant," said Katende.

Nguyen has also traveled worldwide from Ho Chi Minh City, Vietnam. At 14, he left his home country to study abroad in the United States, believing it would give him an edge in educational and employment prospects.

"I was raised in a family of five, including my parents and two younger brothers," Nguyen said. "I was born during a time when my parents did not have many resources or opportunities, and seeing my parents work hard to care for the entire family has inspired my hardworking personality."

Instilling The Entrepreneurial Mindset

Katende's entrepreneurial spirit was sparked in his youth, inspired by his grandmother's supermarket ownership. He learned valuable business lessons by watching her manage the store, from interacting with customers to keeping operations smooth. This early exposure laid the foundation for his entrepreneurial mindset, shaping his understanding of what it takes to succeed.

"Although she was in her 70s, she still got up early every morning to ensure the shelves were fully stocked and ready for the day. I spent most of my time working beside her while she spoke with her customers. She learned everyone's names and spoke with an energetic smile, planting the seeds for a happy day in everyone's hearts."

Nguyen's exceptionally creative parents ignited his passion for entrepreneurship. As a child, they consistently shared their innovative ideas with him. His determination to succeed as an entrepreneur stems from the realization that many of his parents' ideas never materialized.

"My parents enjoyed discussing such ideas over dinner, and listening to them increased my exposure to the world of entrepreneurship. However, there is one problem: they did not have time to work on those ideas, which fueled my entrepreneurial desire even more because I knew I had the time to accomplish amazing things to solve problems."

Creating Through Design

Katende and Nguyen identify as entrepreneurs, driven by their shared ethos of embracing innovation and navigating unconventional avenues to address challenges. Their commitment to problem-solving underscores their entrepreneurial spirit as they continually seek novel solutions and opportunities for growth.

Nguyen states, "I firmly believe that everybody can be an entrepreneur. For me, an entrepreneur seeks to understand the difficulties that others have and then develops solutions to those problems. Entrepreneurs must be hungry, open to new experiences, and eager to improve."

A Community of Like-Minded Individuals

For Katende and Nguyen, joining the Burgess Institute represented more than just excelling in a venture or creating one; it was an encounter with like-minded individuals. For them, the Burgess Institute quickly became a community where they no longer felt alone on their entrepreneurial journey but instead found a place where they belonged.

"The Burgess Institute provides a hub where entrepreneurs can gather with each other in a close community of innovators," said Katende. "Furthermore, the Burgess Institute provides experienced, expert advice and support throughout the entrepreneurship journey."



JOGI KATENDE



DUY NGUYEN

A Scholarship and Dedication

The James Ian Gray Scholarship in Entrepreneurial Studies is profoundly significant to Katende and Nguyen. This prestigious accolade validates their dedicated efforts within the Burgess Institute. It is a powerful motivator propelling them towards their individual and collective business aspirations. They perceive this award as a testament to their unwavering work ethic and substantial contributions to the entrepreneurial landscape.

Nguyen reflects on their selection for the scholarship: "I feel we were both picked for this honor because of our positive work ethic and significant contributions to the Burgess Institute and the community. It means a lot to us since we believe the scholarship will motivate us to work harder and be more active in the entrepreneurial path."

“My objective is to create an impact and enhance people’s lives wherever I go like I have done since I started my business.”

DUY NGUYEN

Anticipating the Future

Katende is eager for the entrepreneurial opportunities ahead and anticipates playing a pivotal role in shaping the future. He looks forward to harnessing his knowledge and experiences to contribute to an African entrepreneurial revolution, aiming to be at the forefront of positive change.

"Since childhood, I have been impressed with America's pioneer attitude toward solving problems," shared Katende, reflecting on his aspirations. "I want to fully experience how this entrepreneurial attitude benefits America and then return to Africa to improve the daily lives of my fellow citizens."

Nguyen has always been more focused on the present impact of his work than on predicting the future. His driving force is believing his efforts today will shape a better tomorrow for others.

"All I know is that I wanted to build our business to serve as many people as possible," said Nguyen. "My objective is to create an impact and enhance people's lives wherever I go like I have done since I started my business."

Each year, the MSU Innovation Center awards the James Ian Gray Scholarship in Entrepreneurial Studies to an MSU student exhibiting the exceptional qualities of an entrepreneur. Named after Dr. James Ian Gray, who spearheaded the creation of the Innovation Center and served as vice president for Research and Graduate Studies at MSU for nearly a decade, this scholarship honors Jogi and Duy's determination as young, motivated creators. James Ian Gray Scholars in Entrepreneurial Studies receive \$2,000 per semester to help cover tuition or student expenses.

BY THE NUMBERS

CORPORATE SUPPORTED PROGRAMS
\$25,252,247

178 INVENTION DISCLOSURES

72 NEW PATENT APPLICATIONS

47 US PATENTS ISSUES

35 EXECUTED LICENSE/OPTION AGREEMENTS

ROYALTIES RECEIVED
\$4,630,743

PRODUCT DEVELOPMENT GRANTS FOR MSU RESEARCHERS

3

ADVANCE
(Advance Grant Program)

11

MTRAC
(Translational Research & Commercialization)

7

TSGTD
(Targeted Support Grant for Technology Development)



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