

# BUILDING A CULTURE OF INNOVATION

## MARQUETTE UNIVERSITY'S EXPLORER CHALLENGE

Submitted to:  
The Honor Society of Phi Kappa Phi  
2018 Excellence in Innovation Award Competition



Submitted by:  
Jeanne M. Hossenlopp, Ph.D.  
Vice President for Research and Innovation  
Marquette University



## TABLE OF CONTENTS

<b>Narrative</b>	<b>2-11</b>
Explorer Challenge Overview	2
707 HUB: Marquette's Innovation Incubator	5
Developing Cold-Tolerant Rice for Commercial Production in Wisconsin	7
Catalyzing a Research Program at the Stroke Rehabilitation Center of Southeastern Wisconsin	8
MARVL: The Marquette Visualization Laboratory	9
Environmental and Water Quality Projects	10
Community Impact Projects	11
Summary	11
<b>Supplementary Materials</b>	<b>12-25</b>
1. Beyond Boundaries: Marquette Strategic Plan	12
2. Interdisciplinary Review of Proposals	13
3. Explorer Challenge Annual Process	14
4. Additional Information about the Explorer Challenge	15
5. Interactive Map of Explorer Challenge Projects	16
6. 707 Hub Planning	
7. 707 Hub Today	18
8. Cold-Tolerant Rice Production in the News	19
9. Additional Health and Well-Being Projects	20
10. Additional Information about the Marquette Visualization Laboratory (MARVL)	21
11. Water and Environmental Projects and People	22
12. Near West Side Projects	24
13. Additional Community Impact Projects	25

## EXPLORER CHALLENGE OVERVIEW

Marquette University's Explorer Challenge is a transformational approach to creating a campus-wide culture of innovation. The Challenge, originally known as the Strategic Innovation Fund, was created in 2014 based on the vision of Marquette's new president, Dr. Michael Lovell. President Lovell had observed during his transition to the University that there seemed to be many people in the Marquette community who had creative ideas but were unsure how to get started to bring these ideas to life. President Lovell brought a strong commitment to innovation from his roots as an engineer and was eager to strengthen this culture at Marquette. During the Fall 2014 semester, the campus community created and endorsed a set of Guiding Values that included *"embody a spirit of interdisciplinary curiosity, research, innovation, and entrepreneurship and application to change and improve ourselves, our community, and our world."* During that same semester, a group of students, faculty, and staff from across campus was convened as the inaugural University Innovation Council to develop a new campus grant program under the leadership of the vice provost for research/dean of the Graduate School, Dr. Jeanne Hossenlopp. A few months later, Hossenlopp was further charged to create a new office as Marquette's first vice president of research and innovation to support this and other related endeavors.

The Innovation Council understood that this new campus-wide competition that they were charged to create would need to have some unique characteristics and that it would need to evolve as the campus innovation culture advanced. One critical lesson that the Council learned over the first few years of the competition was that the language of innovation and entrepreneurial mindset resonated well with some parts of campus, such as engineering, but appeared to people from some other areas on campus as unrelated to their own work, leading to uneven participation. Calling upon the legacy of Marquette's namesake, a 17<sup>th</sup> century Jesuit explorer, the competition was renamed the Explorer Challenge in 2017 to reflect the broader potential of what it means to create and innovate on a university campus. We will refer to the competition as the Explorer Challenge throughout the rest of the narrative.

Held as an annual competition, the Explorer Challenge is unique in that it is open to *all* members of Marquette’s community—students, faculty, and staff—and is not restricted to a narrow band of faculty already experienced with securing internal or external funding. The Challenge encourages interdisciplinary collaboration across campus, as well as community-based partnerships, by supporting the early stage development of projects that support goals of the university’s strategic plan, *Beyond Boundaries* (Attachment 1).

From the start, providing an inclusive process that supported all members of the university community was the primary goal of the Innovation Council. They created an open platform for the Challenge where sharing of ideas and development of collaborative teams is a critical element of the competition. The Challenge employs multiple levels of feedback from all participants to improve the quality of both the projects and the Challenge processes, thereby demonstrating the importance of continuous adaptation and improvement in innovation. Implementation of each year’s Challenge is led by the Innovation Council, supported by the University Leadership Council (deans, vice presidents, and vice provosts) who assist in the final review process (Attachment 2).

The Explorer Challenge kicks off its annual cycle in early fall by bringing the campus together to showcase the current awardees and to introduce the new year’s challenge. After the kick-off, members of the campus community are encouraged to submit preliminary interests online to help structure discussions at *Ideas Fest*, a gathering where emerging concepts are exchanged in a lively setting. It is at these Ideas Fests where faculty, staff, and students often first hear of the exciting work being done elsewhere on campus.

Interested parties next submit two-page pre-proposals for projects that can be led by any member of the current Marquette community. The summary of each pre-proposal is posted online in a searchable database so that individuals have a chance to see what others are doing, and perhaps to realign themselves with others on collaborative projects. In some cases, project teams have merged following the pre-proposal stage to develop larger collaborations involving a single final proposal from independently submitted pre-proposals. The Innovation Council reviews the pre-proposals and returns them with feedback designed to help improve project

ideas. All pre-proposals are eligible to continue to the final proposal stage and major reformulations of ideas are allowed. A series of workshops on proposal writing and budget preparation are held to help further refine ideas. The supporting workshops have been designed to help novice proposal writers develop their ideas and learn how to craft a supporting budget, as well as to help seasoned grant writers present their ideas for a much broader audience than they may typically target. Projects are evaluated based on their level of innovation, potential for impact, and extent to which they help move the strategic plan forward. Community engagement and interdisciplinary collaboration are also deemed positive factors in the holistic review. For the final review of proposals, the Innovation Council is joined by the Leadership Council in providing feedback to the president and provost who make the final funding decisions. Engaging the Leadership Council also has helped move some projects or ideas forward outside of the Explorer Challenge mechanism—each year the Leadership Council is challenged to find additional ways to support worthy ideas that are not funded. A schematic of the annual Explorer Challenge process is shown in Attachment 3.

The Explorer Challenge has supported 72 projects over its first three years, with the fourth year of the competition now in progress. During these three years, a total of just over seven million dollars from internal and donor sources was awarded to 48 faculty-led projects, 13 staff member-led projects, and 11 student-led projects. Faculty-led projects were awarded 67 percent of the total dollars. Staff member-led projects were awarded 20 percent of the total. Student-led projects were awarded 13 percent of the total. Each student-led project has a faculty or staff mentor who advises on the project and provides financial oversight – budgets are loaded in the mentor’s department. Over \$650,000 in funding supported students directly regardless of category of lead person on the project. During the initial three years of the Challenge, nearly 300 people participated in the 72 awarded projects, and 484 pre-proposals were submitted.

As noted above, the process of the Explorer Challenge continues to evolve based on what is learned. Early on it was clear that part of the magic of the process was the interest in people sharing their ideas: we found, for example, at a budget workshop held the first-year, participants stayed long past the end of the formal

program to learn about ideas from other teams. After a few informal meetings with current awardees and getting feedback from them in their annual reports, more regular gatherings of the recipients were established. This has resulted in a new series of workshops being piloted to help our growing community of innovators learn from one another and address some common challenges: this year we are focusing on effective story-telling, building and managing diverse teams, and planning for sustainability.

The remainder of the narrative highlights a few selected projects and summarizes some of the key outcomes of the Explorer Challenge process. Additional information about the Explorer Challenge can be found in the links provided in Attachment 4 and an interactive map of projects housed in the Milwaukee region is included in Attachment 5. The remaining attachments provide additional information about some of the funded projects.

## **707 HUB: MARQUETTE’S INNOVATION INCUBATOR**

Proposed and developed by students, the 707 Hub is a creative new campus space designed to foster collaboration and innovation. The original idea was proposed during the 2014-15 Challenge by two students who applied with the idea of creating what they initially called the “Co-Lab” – a space where entrepreneurially-minded students from across campus could meet and learn from each other. Their proposal was one of the highest rated applications that year and two important aspects were funded. The first was a small operating budget that supported a student-led planning process that was facilitated by staff from the Kohler Center for Entrepreneurship and the Social Innovation Initiative and the office of the university architect. The Kohler Center was located in an under-utilized and less-than-functional space on campus and the Social Innovation Initiative at that time had no permanent location other than a staff office. The student and staff collaborative design team made trips to see other regional innovation spaces, tested out different types of furniture loaned by local suppliers, held pop-up events around campus to get student input, and even tried out their ideas in the existing Kohler Center space (tearing out some of the existing structure and repainting).

The major budget commitment funded renovation of a campus space that would house the Kohler Center, which supports student and faculty entrepreneurship and innovation activities, and the Social Innovation Initiative, which assists campus and community members create just and sustainable solutions to social problems. The space is designed to provide a location for the activities envisioned by the original Co-Lab proposers and is enriched by the synergistic programming offered by the two initiatives housed there. As part of the planning process, the students decided to name the space the 707 Hub as it is housed on the first floor of the 707 Building. The facility offers a variety of workspaces for both individuals and groups, a “pitch stage” to present ideas, and workshop spaces that feature computers, design software, 3D printers, sewing machines, hand tools, GoPro cameras, and VR headsets.

The new space opened in March 2017 and has rapidly become a popular gathering spot for students and a location that faculty and staff utilize for a wide range of events. There has been a 400% increase in Kohler Center participation since the new space has opened. Over twenty-five startup businesses and social ventures are working in the space. Several additional Explorer Challenge projects are supported or housed in the 707 Hub, including work on last year’s Grocery Challenge where students teamed with community members in Marquette’s Near West Side neighborhood to identify solutions to the need for better sources of affordable and nutritious food, resulting in establishment of a local farmers market. MUnchMates, an app being developed by students to help create community through shared meals in campus dining halls is also supported by the 707 Hub staff and students. At the recent one-year anniversary celebration of the opening of the 707 Hub, a panel of student innovators uniformly noted the excitement of being able to learn from each other, the importance of having the Kohler Center and Social Innovation staff as mentors, and how the activities there helped “push them out of their comfort zones to try new things.” Additional information about the 707 Hub can be found in Attachment 6 and 7.

## **DEVELOPING COLD-TOLERANT RICE FOR COMMERCIAL PRODUCTION IN WISCONSIN**

Recognizing the deleterious effects of drought and climate change on rice production in the United States—California and Arkansas account for 80 percent of U.S. production—and a demand for locally sourced food, associate professor of biology Michael Schläppi has been studying the genetics of cold-tolerant rice for over six years. With support from the Explorer Challenge he has succeeded in planting and harvesting Wisconsin's first commercial rice crop. This faculty-led project includes significant student and community participation and has drawn significant local and national media attention. The Explorer Challenge funding has enabled Schläppi to extend his scientific research into a business plan and endeavor that engages a variety of community partners.

Schläppi had experimented with over 200 rice varieties from around the globe in his research program. He started his experiments in climate-controlled chambers in his lab, then built small, raised bed rice paddies on the roof of the Life Sciences building. After this, he added small rice paddies with community partners Alice's Garden Urban Farm and the Fondy Farm, a cooperative of small-scale urban farmers, many of whom are Hmong.

In this inaugural commercial venture, Schläppi planted a short-grain rice from southern Russia (Krasnodarky 3352) on a one-acre parcel rented from the Fondy Farm. For planting and harvesting, Schläppi relied upon both mechanical and human labor. Explorer Challenge funds helped pay for the equipment and the hiring of workers, many from the same Hmong community that grow food through the Fondy Farm. For many of the Hmong, this turned out to be a quite nostalgic and moving experience since they felt that once they had immigrated to the United States that they had lost forever a piece of their heritage—rice cultivation.

In October 2017, Schläppi had his first commercial harvest: 1,200 pounds of rice, just slightly above his original estimate. He is planning on producing 7,000 pounds per acre within the next three years, making the endeavor economically self-sustaining. Over the winter of 2017-18, the rice was sold under the Red Stone Rice label at the Fondy Food Center's Winter Farmers' Market and at Outpost Natural Foods. The Explorer Challenge funded eight student interns, six of whom helped in the lab and in the field, and two who worked in the 707 Hub

on developing a business plan and market analysis, as well as product design. See Attachment 8 for selected news items about Dr. Schläppi's project.

## **CATALYZING A RESEARCH PROGRAM AT THE STROKE REHABILITATION CENTER OF SOUTHEASTERN WISCONSIN**

One of the major themes that emerged among the funded projects is work that promotes human health and well-being. For example, funding from the Explorer Challenge was used to develop a core research program for the emerging Stroke Rehabilitation Center of Southeastern Wisconsin, a joint venture between Marquette and the Medical College of Wisconsin (MCW). The seed funding supported two pilot research projects that included Marquette graduate students working with Biomedical Engineering and Physical Therapy faculty from Marquette and physicians from MCW. In addition to the scientific outcomes from these pilots, the Challenge funding helped catalyze development of a stronger partnership between the two academic institutions. MCW faculty applied for internal support through their Advancing a Healthier Wisconsin endowment that enabled the formation of the Stroke Rehabilitation Center of Southeastern Wisconsin. The joint center includes research staff, a faculty hire through MCW, the establishment of additional research space at Froedtert Hospital (affiliated with MCW), and the development of a database for screening stroke subjects for research studies. The goal of the Center is to enhance the care of stroke survivors, support their families, and provide a better quality of care through translational research. Additional human health and well-being projects are noted in Attachment 9.

## **MARVL: THE MARQUETTE VISUALIZATION LABORATORY**

Experiences that allow for motion within a realistic environment promote active learning, critical thinking, decision making, and improved performance. This is the basis for the MARquette Visualization Laboratory (MARVL), directed by Dr. John LaDisa, associate professor of biomedical engineering.

The lab is a state-of-the-art 1,700 square foot space with computers, software, projectors, surround sound, and other components that produce three-dimensional (3D), immersive (i.e., >180° field of view) virtual reality environments. The immersive environment itself consists of four display surfaces, including an extra wide front wall and floor, two side walls, and seating for over thirty people. Also on-site are a content development lounge, a holographic rear projection screen, and head-mounted virtual reality devices to deliver portable versions of MARVL-generated content. MARVL was created using alumni donations, but did not have annual operating or maintenance budgets, so Explorer Challenge funding was crucial to its startup phase, allowing the group to develop partnerships and secure funding through public and private industry. The MARVL team identified key commercial and industrial sectors to which their content could be tailored: architecture, computational fluid dynamics (CFD), hazard and risk resilience, health care simulation, performance arts, visual arts, infrastructure visualization, and wellness and athletics. The Explorer Challenge funding was utilized to create test-cases that could be utilized to market to potential users and secure revenue to support on-going operations.

During Year 1 of funding (2015-16), MARVL generated \$9,500 in revenue via content developed for partners in the CFD, performing arts, and wellness and athletics sectors. Although sustainability efforts focused on external partnerships, education outcomes were also important: by the end of Year 1, MARVL had worked with over 1,000 students in fifteen different classes from ten academic disciplines across campus.

Year 2 (2016-17) saw \$32,000 in revenue generated, partly by the addition of new interest from the visual arts and healthcare simulation and visualization sectors. In the wellness and athletics sector, MARVL content was licensed by the University to a startup company, Surround Fit & Wellness (SFW), which is selling their immersive experiences to fitness centers and corporate wellness programs. SFW recently partnered with Balance Fitness in Whitefish Bay, a Milwaukee suburb, to bring an immersive approach to group fitness and wellness classes to the public.

Additionally, portable displays (delivered via head-mounted devices) of Marquette's forthcoming Athletic and Human Performance Research Center and proposed renovations to Marquette's Haggerty Museum of Art have garnered interest in the MARVL technology from several architectural firms. Based on a long running collaboration with Marquette's performing arts, MARVL hosted a series of three plays and one dance performance during 2016-17. By the end of Year 2, over 1,500 students in seventeen different classes from twelve academic disciplines were using MARVL facilities, and a graduate class in immersive visualization of biomedical data was taught in the lab. Finally, Dr. LaDisa has also been serving as a mentor for a student-led Explore Challenge project (ALIVE) that is exploring how to create a portable immersive visualization system for a target audience of residents of assisted living facilities. See Attachment 10 for further information on MARVL.

## **ENVIRONMENTAL AND WATER QUALITY PROJECTS**

Over the last decade, Milwaukee has transformed itself into an international hub for water research and technology. Much of this activity takes place at Milwaukee's Global Water Center (GWC), which houses water-related research facilities for universities, existing water-related companies, and accelerator space for emerging companies. The Explorer Challenge has supported interdisciplinary work in Marquette's space in the GWC as well as other environmentally-focused projects led by students, faculty, and staff. The Challenge has helped expand Marquette's Water Law and Policy Program, created partnerships with local water technology companies and start-ups, supported student and faculty research projects, and created opportunities for economically disadvantaged high school students from Milwaukee to engage in water-related curricula, research, and mentoring from the GWC community. The Explorer Challenge also helped artist Mary Miss, in collaboration with our Haggerty Museum of Art, initiate WaterMarks, a public art project designed to engage the Milwaukee community in better understanding of the water systems that impact their lives. Attachment 11 highlights some of these projects.

## **COMMUNITY IMPACT PROJECTS**

As a Jesuit university, Marquette strives to develop men and women who will dedicate their lives to the service of others, actively entering into the struggle for a more just society. Many of the Challenge projects involve our neighborhood initiative, Near West Side Partners, that was created by Marquette and other anchor institutions—Aurora Health Care, Harley-Davidson, MillerCoors, and the Potawatomi Business Development Corporation—to revitalize and sustain this historic neighborhood. Appendix 12 highlights some of the Near West Side Partners Projects and Appendix 13 includes some additional examples of community partnerships.

## **SUMMARY**

The Explorer Challenge has truly transformed Marquette University and our community. The individual projects highlighted here provide examples of some of the tangible outcomes of the individual projects. However, it is the collective effect on our university – providing opportunities for people to dream, collaborate and learn from one another, and to try out new ideas – that is building a vibrant innovation culture where everyone is welcome and encouraged to participate!

# BEYOND BOUNDARIES: MARQUETTE STRATEGIC PLAN



## BEYOND BOUNDARIES

To be recognized among the most innovative and accomplished Catholic, Jesuit universities in the world, it takes a plan.

A plan that pushes Marquette University Beyond Boundaries.

Grounded by our Guiding Values, Beyond Boundaries sets in motion a clear strategy for Marquette’s future — where we want to be, how we will get there and what we can do to go further, to Be The Difference for our students.

Beyond Boundaries is inextricably tied to the university’s mission and vision — it is informed by who we are, and it will inform everything we do to move forward as a transformational university that delivers a transformational education.

### STRATEGIC PLAN GOAL THEMES

#### Pursuit of Academic Excellence for Human Well-being

Advance Marquette as a highly ranked destination university, renowned for academic rigor, high-impact educational experiences, innovation in teaching and learning and achievement of its community of scholars.

#### Research in Action

Advance Marquette as a university committed to research and scholarship with a distinctive emphasis on excellence in strategically defined areas, including innovation.

#### A Culture of Inclusion

Foster a diverse teaching and learning environment and a culture that values, respects, welcomes and promotes a sense of belonging for members of our campus and our community.

#### Social Responsibility through Community Engagement

Distinguished by our ethics, service and promotion of justice, we will position Marquette as a pivotal partner and resource to address issues within our community and beyond its boundaries.

#### Formation of Minds and Hearts

Define the Marquette experience as personally transformative, grounded in Jesuit spirituality and pedagogy, informed by/in dialogue with the Catholic intellectual tradition and Catholic social teaching, and formative in developing men and women of faith and service for and with others.

#### Sustainability of Valuable Resources

Continuously improve university operations to increase efficiencies, sustain shared resources and thrive in tomorrow’s competitive higher education landscape.



[marquette.edu/beyond-boundaries](http://marquette.edu/beyond-boundaries)

## Attachment 2

# INTERDISCIPLINARY REVIEW OF PROPOSALS

Explorer Challenge proposals are reviewed by two groups: the University Innovation Council and the University Leadership Council. Both groups make recommendations to the president and provost who make the final funding decisions.

### University Innovation Council

The [University Innovation Council](#) is charged with developing and implementing the application process for the Explorer Challenge. The cross-campus, interdisciplinary group initially reviews and provides feedback on project pre-proposals, and works with the University Leadership Council in reviewing final proposals. Membership has rotated during the four years of the Challenge and the current Council has the following participants.

Tara Baillargeon, Raynor Memorial Libraries	Katelin Krenzke, Graduate Student
Kathleen Clark, College of Education	Sherri Lex, Graduate School
Ryan Flynn, Graduate Student	Shelly Malin, College of Nursing
Erin Folstad, Research and Sponsored Programs	John Peterson, College of Business Administration
Jay Goldberg, Opus College of Engineering	Jennique Radde, University Advancement
Nathan Hammons, Law School	Kristen Sale, Undergraduate Student
Jeff Janz, Division of Student Affairs	Nic Schmidt, Undergraduate Student
Daria Kempka, Marketing and Communication	Eric Waters, Communication Studies

### University Leadership Council

The [University Leadership Council](#) (ULC) represents all academic and administrative units of Marquette, and comprises the university's senior administrators and deans. The ULC serves as an advisory board for the president.

Attachment 3

# EXPLORER CHALLENGE ANNUAL PROCESS

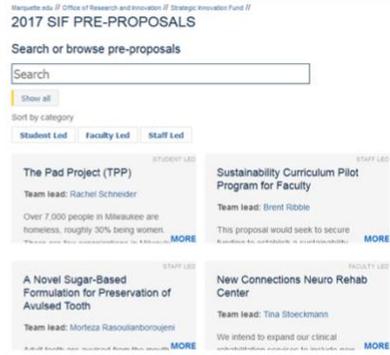
## Fall Semester



Campus Kick-off Celebration



Ideas Fest



Pre-proposals – abstracts posted and feedback provided by Innovation Council

## Spring Semester



Workshops

Final Proposals

Review by University Innovation Council and University Leadership Council

President and Provost make final funding decisions

## Attachment 4

# ADDITIONAL INFORMATION ABOUT THE EXPLORER CHALLENGE

Further details about the [Explorer Challenge](#) can be accessed on the Marquette website. Download samples of this year's [application materials](#) or browse the examples of [project posters](#) displayed during Explorer Challenge kickoff events.

Learn more about every awarded project with our [online searchable database](#) of every awardee. The database provides access to project names, primary contacts, abstracts, and project posters.

Pre-proposals from [2016](#), [2017](#), and [2018](#) are also accessible from the website.



[Difference Makers | Innovation Fund \[Explorer Challenge\], 2016 \(Video\)](#)



A video overview to the Explorer Challenge, originally named the Strategic Innovation Fund

[2015 Ideas Fest \(Video\)](#)

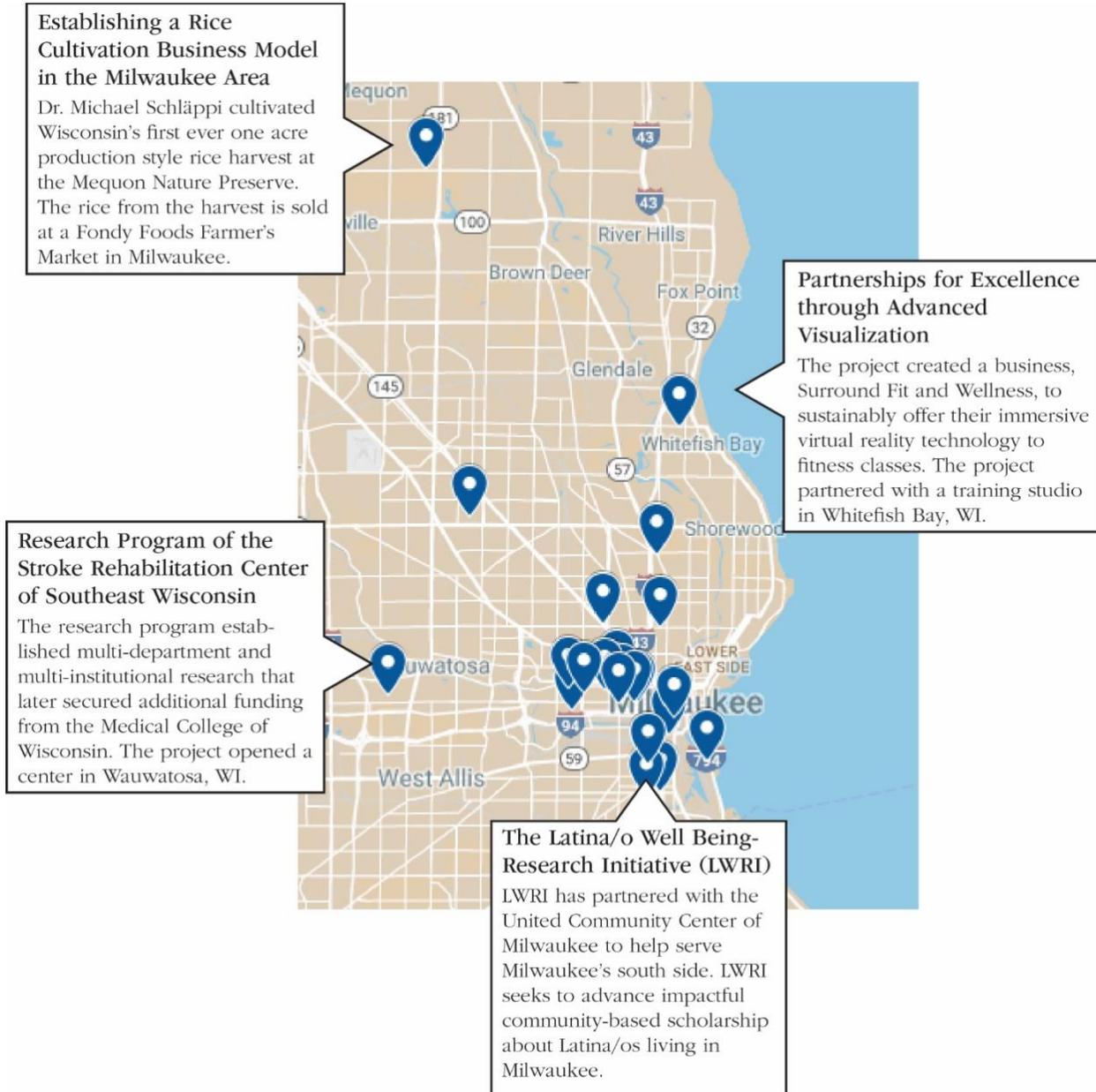


A video featuring participants in the 2015 Ideas Fest

**Attachment 5**

**INTERACTIVE MAP OF EXPLORER CHALLENGE PROJECTS**

Projects funded by the Explorer Challenge are making an impact across the greater Milwaukee area. View the full interactive map online at <http://www.marquette.edu/innovation/explorer-challenge-map.php>.



Attachment 6

707 HUB PLANNING



Sam & Creighton propose a new co-working space for student entrepreneurs: the Co-Lab



Their project evolves to create new space for the Kohler Center, located in the 707 Building



Existing 4<sup>th</sup> floor space used as laboratory to try out ideas



Stakeholder input is used to explore design for the new space. Students, faculty, staff, alumni, and community members participate in the planning process.



## Attachment 7

### 707 HUB TODAY

Proposed and developed by Marquette students, the 707 Hub is a space designed to foster collaboration and innovation, and houses the Kohler Center for Entrepreneurship and its Social Innovation Initiative. The 707 Hub is open to all students, and it encourages a cross-disciplinary approach to solving problems. Learn more at [www.marquette.edu/707-hub/](http://www.marquette.edu/707-hub/).



[Take an online, 3D virtual tour of the 707 Hub](#)

The tour is created by a student entrepreneur whose startup company, Virtuell Space, is developing a software platform for immersive 3D and virtual reality experiences for the senior living



[707 Hub 2016-17 Annual Report](#)

The 707 Hub annual report provides insightful data on innovative and entrepreneurial engagement within the space.



[“Collaboration Station,” Discover Marquette magazine, 2017](#)

Discover Marquette is Marquette’s annual magazine of Research, Scholarship, and Innovation. The 707 Hub is featured on pages 30-31.

## Attachment 8

### COLD-TOLERANT RICE PRODUCTION IN THE NEWS

News items on Dr. Michael Schläppi's cold-tolerant rice cultivation project.



[Professor leads harvest of first rice paddy in Wisconsin](#)

*Marquette Wire*, November 24, 2017

[Trying to give farmers a new option, MU prof harvests state's first commercial rice crop](#)

*Milwaukee Journal Sentinel*, November 2, 2017

[Marquette professor leads history-making harvest: "There could be a bright future for rice farming" \(Video\)](#)

Fox 6 News, October 30, 2017

[Rice planting in Mequon is historic first for Wisconsin](#)

*Milwaukee Journal Sentinel*, June 30, 2017

[Why A Scientist Is Growing Rice On A Marquette University Rooftop](#)

WUWM 89.7, April 24, 2015 (Some of the stories in the WUWM series have been also picked up by the National Public Radio.)

## Attachment 9

### ADDITIONAL HEALTH AND WELL-BEING PROJECTS



#### **Non-Electric Oxygen Concentrator for Developing Countries: Ghana**

A new kind of oxygen system for electricity-limited rural clinics that produces and stores oxygen locally, driven principally by renewable energy sources. Funding supports the building of a prototype for field testing in Ghana.



#### **Applications of Adult Human Stem Cells from Dental Pulp**

Collaborative experimentation with adult stem cells purified from human dental pulp, with particular attention directed to the combined use of 3D printing and stem cells to generate new tissue, or potentially entire new organs.



#### **Milwaukee Trauma Outcomes Project (MTO)**

Advancing interdisciplinary research and community prevention efforts pertaining to trauma and Posttraumatic Stress Disorder (PTSD), particularly among racial and ethnic minorities in Milwaukee.

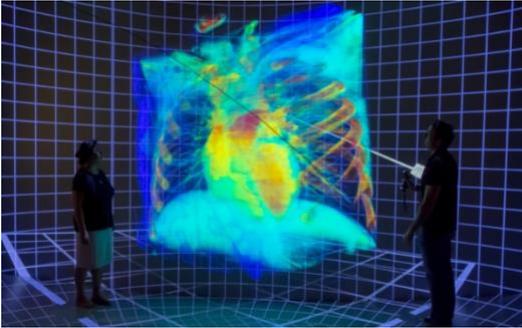


#### **MU Cell Sorting Facility**

The establishment of a next-generation cell-sorting facility, featuring technology that better enables the isolation of cells from complex environments, thereby making it easier to distinguish healthy cells from pathological events.

Attachment 10

## ADDITIONAL INFORMATION ABOUT THE MARQUETTE VISUALIZATION LABORATORY (MARVL)



To learn more about the MARquette Visualization Laboratory (MARVL), its resources, contributors, and a gallery of photos, visit their website at <http://www.eng.mu.edu/vizlab/>.



[Marquette Wellness Immersive Spinning Class with MARVL](#)

[Technology \(Video\)](#)

A video of MARVL technology being used in an immersive spinning class at Marquette



[Surround Fit & Wellness \(SFW\)](#)

A startup company that has licensed MARVL technology.



[Balance Fitness](#)

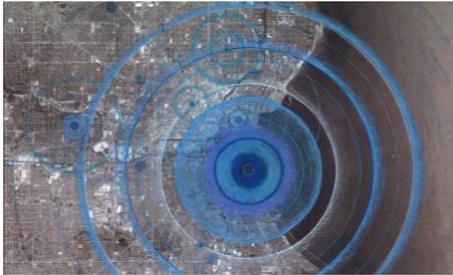
An article from OnMilwaukee on a training studio using MARVL technology through Surround Fit & Wellness.

**Attachment 11**

**WATER AND ENVIRONMENTAL PROJECTS AND PEOPLE**



The Great Lakes Environmental Film Festival was organized by a Joe Brown, a documentary film maker and Marquette faculty member. Festival screenings took place at the Global Water Center.



WaterMarks: An Atlas of Water and the City of Milwaukee launched by visiting artist Mary Miss in collaboration with Marquette’s Haggerty Museum of Art.



High school students explore water science and engineering. Marquette’s Upward Bound TRIO program developed project Freshwater with Explorer Challenge funds.



Dr. Kyana Young, postdoctoral associate supported by Explorer Challenge grant to Dr. Daniel Zitomer, director of Marquette’s Water Quality Lab. Dr. Young has received additional Explorer Challenge funds to create a internship and research program for students from Marshall High School.



Dr. Brooke Mayer received Explorer Challenge funds to collaborate with a water technology start-up in the Global Water Center and has collaborated with Dr. Young on a NSF RAPID grant to create new ways to disinfect water-borne pathogens. Dr. Mayer is also an NSF CAREER recipient.

## Attachment 11 Continued



David Striffling leads Marquette's Water Law and Policy Program which was expanded with support from the Explorer Challenge. The expanded Initiative draws the Law School together with other groups inside and outside the University, promoting scholarly collaboration and demonstrating Marquette's commitment to making Milwaukee a destination for solving water problems.



Dr. Patrick McNamara leads a collaboration with a start-up company and the Milwaukee Metropolitan Sewerage District designed to develop biochars for wastewater treatment.

Additional water-related projects include:

- A student-led exploration of new technologies for desalination.
- A collaborative project involving engineering, chemistry, and biology faculty and students who are developing sensor technologies for detection of trace contaminants.
- A collaborative project involving education and biology faculty and students who are looking at the impact of agricultural run-off on well water quality in rural Kewaunee County in Wisconsin. The project seeks to explore community understanding of their water issues.

## Attachment 12

### NEAR WEST SIDE PROJECTS



#### PARC

Marquette’s Center for Peacemaking partners with the Near West Side Partners on PARC (Promoting our Assets and Reducing Crime) initiative. The project involves the Near West Side anchor institutions, city leadership, and community members working together to revitalize the neighborhood.



#### Rescuing At-Risk Toddlers and Preschoolers from Abuse and Neglect

The development of a professional training program based on the Behavior Clinic’s evidence-based treatment “Early Pathways” program for children under age 5. The Behavior Clinic is a collaboration between Marquette and Penfield Children’s Center, a large community-based agency serving central-city families with young children with developmental disabilities. Successful implementation of the training program allowed the team to be awarded a \$2 million grant from SAMHSA’s National Child Traumatic Stress Network over a five-year period.

#### Marquette Society of Women Engineers Beyond the University Boundaries

A student-led project that provides “near peer” mentoring to middle school students in order to promote STEM careers. The project has collaborated with another Explorer Challenge supported program, STEM HERO.

## Attachment 13

### ADDITIONAL COMMUNITY IMPACT PROJECTS



#### Marquette Democracy Lab

The Marquette Democracy Lab brings together faculty, students, and stakeholders to evaluate local policies, programs, and practices. The lab designed and analyzed two surveys of residents and Marquette students as part of a Near West Side revitalization initiative. They also developed community partnerships with Red Arrow Labs and Milwaukee Public Schools to test a new curricular tool for tracking the health and well-being of students, and with the community organization Common Ground to evaluate their “get-out-the-vote” campaign.



#### Latina/o Well-Being Research Initiative

The Latina/o Well-Being Research Initiative seeks to advance impactful, community-based scholarship about Latina/os living in Milwaukee. Funds allowed the team to establish an action group with community partners; to synthesize existing reports and epidemiological data on the health of Latina/os in Milwaukee; and to increase visibility of the initiative in the community.



STEM HERO

Marquette partnered with start-up STEM HERO to develop programing for students who learn to collect utility data at home that their families can utilize and learn from.

**Engendering Dignity in Philosophy:** A program led by graduate students that creates opportunities for Marquette students and faculty to teach and learn with women in local prisons and domestic violence resource centers. The program provides access to educational opportunity in a way that engenders respect and dignity for all participants.