

UW SYSTEM REGENT SCHOLAR REQUEST FOR PROPOSALS (RFP) (FY 2021-2022)

OVERVIEW

The Regent Scholar program provides **prestigious awards to individual faculty or campus programs** representing the highest level of UW System recognition for faculty innovation, entrepreneurship and business engagement. This **recognition effort** was developed with inputs from faculty and staff research associates, business partners and other outside experts. The program was **introduced formally in 2014**. Eligibility traditionally has been open to all UW System campuses, with awards of up to \$50,000.

This program will continue for FY 2021-20212 and three Regent Scholars will be recognized. Grant funds awarded will be available for faculty working with undergraduate students, graduate students, and other collaborative business and community partners. The program includes a November submission deadline with project evaluations to occur in early December and recipients honored in early 2022.

Regent Scholar awards are **designed to encourage and recognize faculty** who desire to work with undergraduate students and other collaborative partners. The program supports entrepreneurial ideas and innovative projects by accomplishing the following goals:

1. Promoting stellar research experiences for undergraduate students, thus preparing a high-quality workforce;
2. Stimulating research across all UW System campuses, ultimately driving regional economic development; and
3. Recognizing superior undergraduate research in all majors and areas of academic discipline including but not limited to STEM and creative arts fields at the Board of Regents level.

Funding may be used to support these goals including summer support for faculty to engage in research and other scholarly activities. Institutions awarded funds are required to demonstrate measurable outcomes. Awards made will be competitive and based on recommendations by a selection committee made up of both public and private sector experts. **WiSys will manage and administer the program and reporting process.** Each application should indicate plans will go through the IRB or IACUC approval process as appropriate. Awardees will be recognized by the UW System Board of Regents as Regent Scholars.

APPLICATION REQUIREMENTS AND PROCESS

Through a competitive process, Regent Scholar awards will be available for faculty **to explore with undergraduate students, graduate students, and other collaborative partners, entrepreneurial ideas and innovative projects that aim to expand the boundaries of knowledge, enhance research, stimulate new technologies, inspire start-up activity, fuel product development, better prepare the future workforce, and create or retain jobs in Wisconsin.**

To be considered for funding, a proposal must complete all of the following application requirements outlined below. Selection committee members will evaluate each proposal and score it using a possible total of 100 points. Possible point totals for each application section are outlined below. Awards will be made based upon cumulative point totals.

To be considered, applicants must submit the following required documents using the online submission form found [here](#):

1. **Cover Page.** Please use the blank form available on the [Regent Scholar application website](#). The signed

Cover Page should be submitted as a PDF document.

2. **Structured Template for Proposal Narrative containing the following sections** (the Structured Template should be submitted as a Word document and applicants are requested to use the blank form available on the [Regent Scholar application website](#)):
 - a. **Abstract.** Maximum length: One page, double-spaced 12-point font.
 - b. **Description of the project and its innovativeness (*see program description above) (35 points).** Maximum length: Three pages, double-spaced 12-point font.
 - Nature of the research
 - Innovative aspects/intellectual property
 - Entrepreneurial aspects/start-up potential
 - New technologies/product development
 - c. **Project significance and impact (*see program description above) (30 points).** Maximum length: Three pages, double-spaced 12-point font.
 - Job creation or retention, workforce development
 - Student undergraduate research opportunities/involvement
 - Other collaborators/sponsors
 - Business involvement/match grants
 - Organizations/agencies/economic development
 - d. **Roles and responsibilities of faculty investigator and students and collaborators, if any. (20 points).** Maximum length: One page, double-spaced 12-point font.
 - e. **Budget Narrative (15 points).** Maximum length: One page, double-spaced 12-point font.
 - f. **Scientific References.** Maximum length: One page, single-spaced 12-point font.
3. **Budget Spreadsheet** (The Budget Spreadsheet should be submitted as an Excel document and applicants are requested to use the blank form available on the [Regent Scholar application website](#)).
4. **Appendix** (Applicants are requested to use this section to upload a combined PDF document containing the primary faculty investigators CV (3-page limit), if submitted, any letters of reference from individuals within the business community and/or letters of commitment from collaborators.)

Budget Requirements and Guidelines

The detailed budget shown in the budget spreadsheet should itemize proposed expenses along the lines of salary, student stipends, equipment, and travel, along with other eligible expenses. Funds may be used for many purposes, such as salaries (including course release with institutional approval), wages, consultants, equipment, materials, supplies, and travel. Fringe Benefits are provided for UW System employees listed in the budget spreadsheet. If awarded, Fringe Benefits will be covered by the GPR Fringe Benefit Pool and will be automatically transferred by UW System directly. Therefore, funds for Fringe Benefits should NOT be included in the salary requested column nor should they be included within the \$50,000 budget. It is expected that students will be compensated to a level that allows them to participate fully in the summer project. Indirect costs are not allowed. Funding is for FY 2021-2022 and FY 2022-2023. All projects should be completed no later than August 31, 2023.

Additional Documentation

Letters of reference from individuals within the business community and/or letters of commitment from collaborators are welcomed, though not required. These should be included in the Appendix as outlined above.

Universities may submit multiple bids, though each university is limited to a maximum of two (including applications from its branch campuses). The awards application process will need to be managed on each campus, per university norms, but is likely to include submission by the institution's research grants office. Submissions through the institution's research grants office should be made using the online submission form found [here](#). Each application should be submitted using separate new form.

KEY DATES AND TIMELINE

1. For the 2021 program, the application deadline is **November 5**.
2. Applications will be reviewed upon submission to ensure completeness. Completed applications will be forwarded to the selection committee for review by **November 12**.
3. The selection committee will review and discuss (in-person and/or via teleconference) applications in early December.
4. The selection committee will make final award decisions **before year end**.
5. UW System will distribute award funding to recipients beginning **in January, 2022**.

SELECTION COMMITTEE AND PROCESS

The selection committee includes individuals from both the public and private sectors. One of the members will be a Regent or Regent Emeritus; two members will be employees of UW System; and three non-UW System members will be from Wisconsin businesses and organizations experienced with economic development, workforce development, STEM, and arts and humanities education.

Selection committee members will evaluate each grant proposal and score it using a possible total of 100 points. Possible point totals and guidelines for each application section are outlined below.

Awards will be made based upon cumulative point totals.

1. **Description of the project and its innovativeness (35 points)**
2. **Project significance and impact (30 points)**
3. **Roles and responsibilities of faculty and students (20 points)**
4. **Detailed Budget and Budget Narrative (15 points)**

AWARD TERMS AND REQUIREMENTS

In early 2022, the UW System Board of Regents will formally recognize faculty and students involved in the project as Regent Scholars. Recipients will be encouraged to disseminate the results of their work in local, national, and international venues as appropriate.

It is expected Regent Scholars will work with the UW System to document the education, economic and workforce outcomes of the Regent Scholar Program over time.

All award recipients shall provide reports to the UW System. For projects with end dates of August 31, 2023, a progress report shall be due on or before December 31, 2022. A final report is due by September 30, 2023. UW System has partnered with WiSys to monitor the project progress and milestone achievements. All reports should be submitted to grants@wisy.org by or before the above referenced deadlines. A progress and final report template will be provided with an applicant's award letter and should be used to supply data to capture:

- The impact of undergraduate research experiences on student learning, workforce readiness, preparation and professional success, including, if appropriate, postgraduate placement and success;
- Expansion of research activities and scholarship outputs at four-year and two-year campuses;
- Economic development contributions of UW System universities to the State of Wisconsin.

AWARD RECIPIENT HISTORY (2015-2019):

UW System Regent 2015 Scholars to be honored for research, innovation, entrepreneurship

MADISON – Five recipients of the new Regent Scholar awards were honored by the Research, Economic Development, and Innovation (REDI) Committee at the University of Wisconsin Board of Regents' February 5, 2016 meeting in Madison.

The UW System Regent Scholar program was introduced last fall to recognize and reward innovative faculty-student research and to provide support for collaborative UW project initiatives with Wisconsin business and industry.

"These grants **recognize and honor outside-the-box thinking by UW faculty and undergraduates** across Wisconsin. The awards provide recognition at the highest level for work done by our dedicated and talented faculty to prepare a high-quality workforce for the 21st-century economy and ultimately to accelerate business and community development statewide," said UW System President Ray Cross.

Regent Tim Higgins, chair of the REDI Committee, added, "The Regent Scholar program was developed and designed to encourage cutting-edge undergraduate research projects that have the potential to lead to job creation and foster entrepreneurship. These first recipients are shining examples of the innovative and exciting work that is being done on our UW campuses."

Key objectives of the new Regent Scholar program include providing summer funding support for faculty to engage in research and other scholarly activities while stimulating innovation and industry outreach at UW System campuses across a wide spectrum of academic pursuits.

UW System Regent Scholar recipients for 2015 included the following:

UW-Eau Claire, Dr. Jennifer Dahl. \$50,000 grant

Janus nanoparticles: A practical pathway toward functional materials for efficient photovoltaics, optical circuits, and nanomedicine

- **Project description:** Working with undergraduate researchers, this project will focus on the creation of cross-linked Janus nanoparticle networks that will foster multiple new technologies and applications. These include nanoparticle-based films that increase the efficiency of inexpensive solar-cell materials and the usefulness of integrated optoelectronic circuits, and which also support the development of customized, anti-cancer treatments.

UW-La Crosse, Dr. Heather Schenck. \$36,706 grant

Rotation barriers in hydroxamic acids: Optimization of metal-binding molecules for medical and industrial applications

- **Project description:** Hydroxamic acids are small chemical structures used in medicine and industry. These materials bind metals and are used for processing of ores and for removing excess iron from blood. They are also used in cancer chemotherapy and contemplated for use in the treatment of viral and bacterial infections. Undergraduate researchers will focus on activities that involve chemical synthesis and nuclear magnetic resonance spectroscopy. Both skills are essential for chemical professionals.

UW-Milwaukee, Dr. Junhong Chen. \$50,000 grant

Smart phone-supported sensors for real-time monitoring of heavy metal ions in water

- **Project description:** The project focuses on engaging undergraduate students in developing a prototype smart phone-supported sensor for low-cost, real-time monitoring of heavy metal ions in water. The project will also benefit water industries and smart phone makers by enabling additional real-time sensing capabilities with smart phones to increase product performance, market share, and most importantly, to create or retain jobs in Wisconsin.

UW-River Falls, Dr. Tim Lyden. \$50,000 grant

Development and testing of a new miniature bioreactor system prototype as an enabling technology for the "Living Biopsy" approach to cancer research and diagnosis

- **Project description:** The project combines scientific insights from 3-D artificial tissue generation research done with undergraduate researchers at the UW-River Falls Tissue and Cellular Innovation Center with an existing technology from industrial partner Microscopy Innovations, LLC of Marshfield, Wis. This technology will facilitate screening and testing of therapeutic approaches to cancerous tumors. The initiative additionally supports biotechnology start-up company Artificial Tissue Systems, LLC, in western Wisconsin.

UW-Stevens Point, Dr. Christopher Hartleb. \$50,000 grant

Aquaponics innovation through undergraduate education and discovery

- **Project description:** Aquaponics, or integrated fish and soil-less plant production, represents a transformational global business opportunity for small- and large-scale food production. The goal of the project is to provide research experience for undergraduates while preparing a high-quality workforce for the growing aquaponics industry, focused on food safety, locally grown products, and sustainable harvesting practices. Private-sector partners include Northside Enterprises, which has developed a fast growing, hybrid walleye for Wisconsin's aquaponics industry, and Nelson and Pade, Inc.[®], a national leader in aquaponics.

Grants were awarded competitively based on recommendations by a selection committee made up of both public and private sector experts: Kris Andrews, UW System Associate Vice President for Federal and Corporate Relations; Reed Hall, Secretary/CEO of the Wisconsin Economic Development Corporation; Stephen Kolison, UW System Associate Vice President for Academic, Faculty, and Global Programs; Jim Ladwig, Racine County Executive; John Oathout, Executive Vice President and Trust Officer for American National Bank of Beaver Dam; and committee chair Mark Tyler, President/CEO of OEM Fabricators and UW System Regent Emeritus.

UW System 2016 Regent Scholar recipients included:

UW-Eau Claire, Associate Professor Joseph Hupy, \$50,000 grant

Lowering overhead inventory costs within the industrial aggregate and sand mining industry using Unmanned Aerial System (UAS) technology

- **Project description:** The purpose of this student/faculty collaborative research is to stimulate innovative applications of Unmanned Aerial Systems (UAS) that directly connect to growing demand in the geospatial workforce and to foster regional economic development. The proposal specifically targets lowering overhead costs for volumetric analysis within the industrial sand and aggregate mining industry using UAS technology.

UW-Platteville, Assistant Professor Mohammad Rabbani, \$50,000 grant

Design and Synthesis of Nitrogen-Rich Porous Organic Polymers with Ultra-Small Pores and Their Uses in Construction of Porous Membranes for Gas Separation Application

- **Project description:** Landfill gas, which is produced from municipal solid waste at landfills, has been long touted as a promising energy source in Wisconsin and the Tri-State (Wisconsin, Illinois, Iowa) area. However, landfill gas is approximately 50% carbon dioxide (CO₂), and CO₂ removal remains a big hurdle to make this a potent, money-making energy source. This project outlines research designed to prepare porous membrane composites using nitrogen-rich and ultra-porous organic polymers to separate CO₂ from gas mixtures which could provide significant value to CO₂ gas separation technology. The project also serves as an opportunity for undergraduate students and faculty at UW-Platteville to work together in a cutting-edge technology, collaborating with industry partners in Wisconsin and the Tri-State area.

UW-Oshkosh, Professor Toivo Kallas, \$50,000 grant

Rotation barriers in hydroxamic acids: Optimization of metal-binding molecules for medical and industrial applications

- **Project description:** Mitigation of carbon emissions is a global economic and ecological imperative. Microalgae can help address the issue through its very high photosynthetic efficiency. This project will enable undergraduate students to engineer and characterize an ultra-fast-growing cyanobacterium (blue-

green alga) for efficient carbon conversion to isoprene, a precursor for synthetic rubber, pharmaceuticals, and biofuels. Additionally, the project will jump-start an initiative to enable commercially viable industrial CO2 capture through accelerated processes.

Regent Scholar Grants were awarded competitively based on recommendations by a 2016 selection committee including both public and private sector experts from a variety of sectors:

- Mark Tyler, President/CEO of OEM Fabricators; UW System Regent
- Frank Cannella, Founder of Cannella Response Television
- Aaron Hagar, Vice President of Entrepreneurship and Innovation, Wisconsin Economic Development Corporation
- Bob Jokisch, UW System Special Assistant to the Vice President for Academic and Student Affairs
- Mark Pioli, Policy and Planning Analyst, UW System Office of Policy Analysis and Research
- John Russell, CEO/President of Columbus Community Hospital

UW System 2018 Regent Scholar recipients included:

UW Oshkosh, Associate Professor Yijun Tang, \$50,000 grant

Enzyme-Free Glucose Sensors Composed of Molecularly Imprinted Polymers and Nanosized Metal Particles

- **Project description:** Dr. Tang's new glucose sensors have greater stability and effectiveness than the standard enzyme-based blood testing strips. They also last longer, are more accurate and more durable than current strips. Additionally, this product could be used to monitor glucose in other bodily fluids that would be too harsh for enzyme strips, or to test samples in food production.

UW-Platteville, Assistant Professor Gokul Gopalakrishnan, \$50,000 grant

A Rapid Customizable Technique for Pathogen Separation and Biomolecular Detection

- **Project description:** Dr. Gopalakrishnan's work is focused on developing a new technology for the rapid and simultaneous separation and concentration of different types of microscopic biological materials, by size and shape, such as proteins, viruses, and bacteria. Such a system, comprised of multi-filter stacks of silicon porous nanomembranes, could be used for field testing of groundwater contamination as well as separation of nanoscale biological samples in the lab.

UW-Parkside, Assistant Professor Zaid Altahat, \$25,000 grant

UW-Stout, Assistant Professor Saleh Alnaeli, \$25,000 grant

Empirically Examining the Source Code Security and Vulnerabilities in General-purpose Software Systems

- **Collaborative project description:** This collaborative research project helps software instructors better design and plan training courses and curriculum that provides secure coding practices for undergraduate students and software developers. Dr. Alnaeli's research focuses on software security and addresses source code vulnerabilities through the application of automatic parallelization and multicore programming, the Internet of Things, and static analysis approaches. Dr. Altahat's research is focused on embedded software, software engineering, mobile and web apps, and agile methodologies.

Regent Scholar grants are awarded competitively based on recommendations by a selection committee which included entrepreneurs, technical experts and academic specialists in a variety of fields:

- Dr. Tracy Davidson – Director of STEM and Applied Research Initiatives, UW System (Madison)
- Amy Furreness – Field Sales Engineer, Shimadzu Scientific Instruments (Kenosha)
- Aaron Hagar – Vice President of Entrepreneurship & Innovation, Wisconsin Economic Development Corporation (Madison)

- Zach Halmstad – Co-Founder of JAMF and Co-Founder of Pablo (Eau Claire)
- Peter Romenesko – Director, TitleTown Tech Innovation Lab (Green Bay)
- Tom Still – President, Wisconsin Technology Council (Madison)
- Mark Tyler – President/CEO, OEM Fabricators; UW System Regent and selection committee chair (Woodville, Wis.)

UW System 2019 Regent Scholar recipients included:

UW-Eau Claire, Associate Professor Elizabeth Glogowski, \$50,000 grant

New Branched Stimuli Responsive Polymers for Architectural Coating Applications

- **Project description:** Architectural coatings, including paints, primers and stains, require complex formulations that combine pigments, fillers, dispersants, solvents and additional components. New technologies to improve these formulations, particularly materials that improve the dispersion of the pigment titanium dioxide, can decrease cost, decrease need for harmful volatile organic compounds, and enable new advanced applications such as one-coat-hide and paint-and-primer-in-one coatings. This project focuses on the development of novel stimuli-responsive polymer structures for use in architectural coatings such as paints, primers and stains.

UW-Milwaukee, Professor Karyn Frick, \$50,000 grant

Potential Memory-Enhancing Effects of the Novel Estrogen Receptor Beta Agonist EGX358 in a Mouse Model of Alzheimer's Disease

- **Project description:** This project focused on testing the effects of a novel estrogen receptor beta (ERB)-selective agonist on memory formation and brain function in a female mouse model of Alzheimer's disease (AD) that reproduce the genetic and pathological alterations inherent to AD in humans. This agonist, EGX358, is the first of its kind in a novel class of ERB-selective drugs called "A-C" estrogens. Estrogen loss at menopause is associated with elevated risk of age-related memory loss and AD. However, traditional estrogen treatments are not recommended for the prevention or treatment of memory impairment because of risks of cancer (breast, uterine), heart disease, and stroke. In contrast, activation of ERB receptors does not confer these risks and is associated with reduced AD risk.

UW-Whitewater, Professor Prajukti (juk) Bhattacharyya, \$50,000 grant

Developing Prototype Multimodal Sensors and Wireless Network System for Landslide Monitoring and Early Warning

- **Project description:** Landslides, mudslides, and similar large-scale mass movements can be caused by excessive rainfall, steepening of slopes by natural erosion or human actions, moisture in the soil, rocks breaking by weathering, volcanic eruptions, earthquakes, and similar triggers. Such mass movements cause significant damage to property and life worldwide. Given the increased level of road construction and urbanization, changes in precipitation patterns, and increased risk of wildfire and other triggers for landslide due to global climate change, the life and property damages from landslides will steeply increase in future. Landslides are currently monitored by fieldwork, satellite images, and sensors measuring slope movement, rainfall, soil moisture, etc. However, there is no uniform system for landslide monitoring, or an instrument to sense multiple factors leading to landslides, perform risk assessment based on the cumulative effects of different risk factors, and provide early warning via electronic communication for evacuation and mitigation purposes. This project aims to design a prototype for such a multimodal sensing mechanism with a built-in algorithm capable of assessing landslide risk, and generate early warnings via electronic communication as the final deliverable.

Regent Scholar grants are awarded competitively based on recommendations by a selection committee which included entrepreneurs, technical experts and academic specialists in a variety of fields:

- Pehr Anderson – Chairman, Silicon Pastures (Wauwatosa)
- Kelly Berry – Partner, ResourceAbility, LLC (Altoona)
- Dr. Tracy Davidson – Director of STEM and Applied Research Initiatives, UW System (Madison)
- Teresa Esser – Managing Director, Silicon Pastures (Wauwatosa)
- Aaron Hagar – Vice President of Entrepreneurship & Innovation, Wisconsin Economic Development Corporation (Madison)
- Kyle Weatherly– CEO, Frontdesk, LLC (Milwaukee)
- Steve Wilcox – Owner, The Resultants (Minneapolis)
- Mark Tyler – President/CEO, OEM Fabricators; UW System Regent and selection committee chair (Woodville, Wis.)