2016

Discovery: Research Annual Report 2016

Office of Vice President for Research

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Western Michigan University is proud of its long research tradition, a tradition rooted in serving the community and the people around us. Hear ‘community’ as an evolving idea that is geographically determined by local, regional, state, national and global coordinates. In other words, as a national research institution of higher learning, we focus on the challenges we all face and offer solutions in ways that impact us all.

This past fiscal year was a great year. We continued to extend our reach, our imagination, our research and our presence in significant ways.

Locally, we made an indelible mark in the autism arena, helping families who need our expertise, help, and diagnostic assistance. Known internationally as a leader in behavior analysis, funded by the State of Michigan, and reaching children and adults affected and impacted by autism – WMU meets each family as a unit. We are making a difference in lives and in families, and that matters. Today we are training tomorrow’s leaders who will continue to stretch the reach of our discovery efforts in the field of autism. Because of this, tomorrow shines brighter with hope for many families, especially when those trained here in southwest Michigan share their skills around the world.

At a state level, WMU is primed to serve Michigan in visible ways with a $500,000 legislative investment in the Michigan Geological Survey which will be used to map the subsurface of Michigan. The MGS conducts its work as part of the Department of Geosciences. The Survey uses the collection of geological samples at the Michigan Geological Repository for Research and Education in its research and outreach. Our work in mapping the State’s minerals, natural gas, and water resources is a vital part of the sustainability and renewal efforts for natural resources.

Nationally and globally, aviation as a discipline is challenged by a shortage of pilots. WMU is committed to training the best pilots and designing some of the most advanced training tools for others to use in training additional pilots. Indeed, this past year the Federal Aviation Administration selected WMU as a core team member in a new FAA Center for Excellence for Technical Training and Human Performance. Funded by the FAA, this center will forge new paths into the future of aviation technical training practices and research ventures.

Distinguished as a learner centered, discovery driven, and globally engaged University, we are making an impact. We invite you to see the ways we are making a difference in people’s lives – spanning from our local into the global arena. Together we continue to make a difference, and we invite you to join us in celebrating. To learn more about the University and our research endeavors, visit wmich.edu/research.

John M. Dunn, Ed.D.
President

Daniel M. Litynski, Ph.D.
Vice President
Office of the Vice President for Research
Western Michigan University’s Kalamazoo Autism Center, a treatment center for young people diagnosed on the autism spectrum, was formally opened during a grand opening ceremony this fall.

Part of the WMU Autism Center for Excellence, the Kalamazoo Autism Center has major funding from the Michigan Department of Health and Human Services. WMU’s extensive efforts to offer autism services and train professionals in the field attracted a $4 million award approved by the Michigan Legislature in 2014, and some of that funding supported the renovation of the KAC’s new home, which was purchased by the University a year ago.

Special guests and members of the community had a chance to tour the center’s dramatically expanded space at its new location, 4200 S. Westnedge. The former pediatric medical center is located in a neighborhood setting and has been completely renovated, allowing the KAC to ultimately serve up to 40 young people ages 2 to 21 who have been diagnosed on the autism spectrum. Formerly, the KAC had been operating within the Child Development Center, a well-established child care provider on Cork Street and serving about six clients at any given time. The center also will provide parent support services and be a resource on all aspects of autism assessment and treatment.

The Kalamazoo Autism Center was established in 2008 by Dr. Richard Malott, who has been directing the facility and, in conjunction with WMU’s Department of Psychology, has been providing applied behavior analysis services to southwest Michigan children with autism. The program provides advanced practicum training for psychology students from the University.
According to KAC Clinical Director Dr. Kelly Kohler, herself a product of WMU’s renowned training programs for professionals, the KAC staff works one on one and in small groups with the young people it serves, providing intensive behavioral interventions to help them with the development of pre-academic, communication and daily living skills as well as social, play and vocational skills.

“The research shows that 30 to 40 hours per week of applied behavior analysis is the most effective approach, and the earlier the intervention the better,” Kohler says. “Much of that early intervention work is done one on one. We’ll be offering a blend of the classroom experience that is part of a normal school day with one-on-one work to address individual needs.”

The KAC will be self-sustaining, and the center accepts private pay, Medicaid and private insurance for its services. The staff members expect slow, but steady growth in the number of young people served, predicting a client base of about 20 by the end of the year. Ultimately, as stated earlier, as many as 40 young people and their families will be served.

For more information, contact the center at psy-kac@wmich.edu.

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A. Senator Margaret O’Brien joins psychology chair Dr. Stephanie Peterson, Vice Provost Jim Gilchrist, Dean Carla Koretsky, and Dr. Richard Malott in cutting the ceremonial ribbon.

B. Senator Margaret O’Brien and Congressman Fred Upton speak at the dedication ceremony.

C. The community gathers for the opening of the new Autism Center.

D. Dr. Stephanie Peterson, chair of psychology, engages with community supporters during the open house celebration.
WMU’s Geological resources leveraged as an environmental protection and economic development tool
Legislature invests $500,000 in Michigan Geological Survey at WMU

Most recently, a $500,000 investment by the state of Michigan in the Michigan Geological Survey is being used to map the subsurface of Michigan in a way that will dramatically enhance economic development and ensure that vital natural resources are analyzed, protected and used widely.

Area legislators and geoscientists gathered recently on the Western Michigan University campus, which has been home to the state survey since 2011, to announce the funding that is part of the 2017 Michigan budget. They outlined the statewide geological mapping that is vital to Michigan’s future and announced one Kalamazoo-area initiative that will benefit from that mapping.

“This funding will allow us to leverage the skills and resources of our geoscientists and better analyze and protect vital state resources in a way that can make an enormous difference in our state’s future,” said WMU President John M. Dunn at the event. “We’re grateful to our local legislators who championed this funding.”

John Yellich, director of the Michigan Geological Survey, says the state funding will allow the survey to begin to take full advantage of its potential as both an environmental protection and economic development tool. In addition to water, the state’s subsurface natural resources include limestone, minerals, soil, sand, salt, oil, gas and ores. With only 10 percent of the state subsurface mapped to date, Michigan is at an economic disadvantage and has fallen behind neighboring states, he notes.

The four-month survey work in Portage will begin the systematic mapping of 55 square miles of subsurface, using data from 220 stations to produce maps that will both define the size and scope of the valleys and deliver the information needed to protect them.

Since 1982, WMU has been home to an extensive set of one-of-a-kind core samples and well records that have made the University the preeminent source for data on Michigan’s subsurface geologic layers. WMU’s Michigan Geological Repository for Research and Education makes information about those layers available by maintaining online databases and housing a comprehensive archive of Michigan geological samples and data.

More than 500,000 feet of rock cores from oil, gas, water and environmental research wells and from glacial research and Lake Michigan bluff erosion studies are included in the archive. It also contains impressive collections of geologic maps, thousands of drillers’ reports, electrical and mechanical logs, mudlogs, porosity and permeability analyses, and related well data.

The Michigan Geological Survey was relocated to WMU by the state of Michigan in 2011, making WMU Michigan’s designated geoscience agency. This move puts responsibility for mapping and assessing the state’s geological resources – such as minerals, soils and groundwater – in the hands of the University’s Department of Geosciences.

Those federal matching funds for mapping have been available for the past 24 years, but Michigan has used that opportunity at a lower rate than other Midwest states. Ohio, for instance, has used nearly $3 million in federal matching funds to map 80 percent of its priority areas. A recent study shows the data and research that Ohio’s Geological Survey produces has a minimum annual economic impact on that state of $575 million. In Kentucky, state officials say they’ve experienced a $25 to $38 benefit for every dollar spent on geological mapping.
Western Michigan University received three grants totaling $434,690 from the Federal Aviation Administration NextGen Weather Technology in the Cockpit program to study weather information systems to improve general aviation safety and, ultimately, reduce accident risk.

The grants fund three of four Federal Aviation Administration projects aimed at improving the use of weather information in the cockpit. The goal is to use the latest weather technology research to improve pilot decision-making during adverse weather conditions and enhance crew awareness.

“The bottom line is that aviation overall has increased in safety,” says Lori Brown, WMU associate professor of aviation, who is principal investigator for WMU on two of the research projects. “About two-thirds of all general aviation accidents that occur in instrument meteorological conditions are fatal—a rate much higher than the overall fatality rate for general aviation.”

Reducing general aviation fatalities is a top priority of the FAA and similar to commercial aviation, the FAA is focused on reducing general aviation accidents by using a primarily non-regulatory, proactive, and data-driven strategy to get results.

All four of the projects are through the FAA’s Partnership to Enhance General Aviation Safety, Accessibility and Sustainability—PEGASAS—program, whose mission is to enhance general aviation safety, accessibility and sustainability by partnering the FAA with a national network of world-class researchers, educators and industry leaders.

In one project, titled “Visual Flight Rules into Instrument Meteorological Conditions Transition” and funded by a $104,226 grant, Brown and WMU are partnering with Purdue University. In the project’s first phase, researchers surveyed more than 600 pilots and conducted focus groups to identify the gaps in weather-related pilot training.

“We wanted to find out how...aviation safety is improving as a whole,” Brown says, “but general aviation weather-related accidents are still occurring. We’ve been looking to find where the gaps are and what we can do to close the gaps.”

Brown and her WMU colleagues Bill Rantz, Geoff Whitehurst, Dennis McFall, Dominic Nicolai, along with Dr. Beth Seiler, are developing innovative training modules to construct interactive, computer-based decision trees that can be used by a broad demographic to improve decision making in unintentional transition into adverse weather conditions. They evaluated pilots in late July using flight simulators at the FAA’s William J. Hughes Technical Center in Atlantic City, N.J.

Not all pilots are trained in a structured academic program like the WMU College of Aviation as part of a New Center of Excellence

While the WMU College of Aviation remains active as an affiliate and core team member in two FAA Centers of Excellence (see Lori Brown et al’s work in related story on weather-related aviation safety training), WMU has been selected as a core team member in a new FAA Center for Excellence for Technical Training and Human Performance. This COE will conduct research and development on technical training for air traffic controllers, aviation safety inspectors, engineers, pilots and technicians.

The FAA’s Center of Excellence program is a partnership between academia, industry and government. Congress authorized these centers under the Federal Aviation Administration Research, Engineering and Development Authorization Act of 1990. (www.faa.gov)
WMU forms alliance with Florida Southwestern State College to expand its reach in Florida

Officials from Western Michigan University and Florida Southwestern State College recently announced an alliance that will allow WMU to offer several high-profile academic programs at FSW’s Charlotte County, Florida, campus.

"Florida is home to the highest number of WMU alumni outside of the Midwest and presents great opportunity for new research, development and partnerships," Dunn says. "Our alumni and University supporters are thrilled that WMU is partnering with FSW to become an economic and cultural force in the area."

Earlier this year, Florida’s Commission for Independent Education approved two provisional licenses for the University to offer academic programs in Florida. Final approval for WMU program offerings must come from the Higher Learning Commission, which is the University’s accreditation body. Once such approvals are obtained, WMU and FSW will be able to release details regarding various degree programs that will be offered.

WMU, which is known for providing academic programs in aviation, wellness, business and environmental studies, also works with industries and businesses to customize educational offerings and credentialing certifications.

Aviation, Brown adds. “It can be a different experience, based on where you’re getting your training,” she notes. “We’re trying to develop something that could be available through an electronic link—computer-based training to pilots in the entire nation.”

In phase two, researchers are testing pilots who have received enhanced training using events from real accidents, Brown says. Pilots go through training, respond to events, make decisions and then are evaluated and compared with those receiving traditional training.

“In the survey and focus groups we conducted, the pilots themselves, the examiners and the certified flight instructors indicated the gap is the lack of ability of pilots to correlate the weather knowledge that they have,” Brown says. “In other words, they’re learning about weather; they’re learning how to read charts and graphical displays, but it doesn’t really prepare them to have the ability to make sound decisions in-flight, to put decision-making and weather knowledge together. That’s one of the gaps we’re looking at.”

WEATHER TECHNOLOGY IN THE COCKPIT

Brown’s second research project, titled “General Aviation Weather Alerting,” is funded with a $158,906 FAA grant in partnership with Texas A&M University. It will look closely at weather technology in the cockpit and weather devices and functions.

“Pilots can get all their pre-flight weather information, their weather pre-flight briefing, and plan their flight, make their go or no-go decision and start their flight and then the weather can change somewhere along their flight and they may not have the ability to have that information while they’re en route,” Brown says. “We’re testing out new ways to alert the pilot when weather has changed.”

In particular, Brown’s second project is collaborating with Dr. Thomas Ferris at Texas A&M University and such industry partners as Delorme and Lockheed Martin, to come up with innovative ways to alert pilots. One is to use Delorme’s inReach device, which uses the Iridium Constellation Satellite Network to reach pilots anywhere in the world, including in remote areas where they have lost radar. Using the satellite system, researchers are able to send pilots weather updates through Lockheed Martin’s Adverse Condition Alerting System. Another method is to communicate with pilots using a vibrating wristband to let pilots know there is new weather information available. The new information is displayed to the pilot on the Pebble watch, using the vibration to call attention to the new information. This is the first study of its kind to evaluate weather alerting sent to a wrist device. The evaluations took place in Atlantic City at the FAA’s Hughes Technical Center and in-flight in WMU aircraft piloted by College of Aviation instructors.

The College of Aviation is now drafting a proposal for phase three of their research to look at retention of new training modalities in aviation to reduce accident risk for weather-related accidents in general aviation.

THE LATENCY EFFECT

The third WMU project, titled “General Aviation MET Information Optimization,” is also in partnership with Purdue University and funded with a $171,558 FAA grant. Geoff Whitehurst, associate professor of aviation, is WMU’s principal investigator. Whitehurst is overseeing a research team that is investigating the effect of latency or delay due to data transfer rates of NEXRAD information presented to pilots during bad weather.

Radar images can be from seven to up to 12 minutes old. A pilot using only that radar image might see clear skies ahead, when it was actually clear seven to 12 minutes earlier. That latency period has been absent in flight simulation training.

Whitehurst and his fellow researchers have developed a computer-based training aid which replicates NEXRAD radar imagery that has the delay built into it for flight simulation.

“General aviation pilots often believe that the weather images they receive in the cockpit are a true representation of what is occurring in front of them,” Whitehurst says, “when in fact the information can be up to 30 minutes old. They base their decisions on where the weather, possibly thunderstorms, was and not where it is now. The simulation will allow general aviation pilots to experience this delay and the problems associated with basing decisions on ‘old’ information, while safely on the ground.”
GOAL ATTAINMENT SCALING: A MOBILE APP  
Principal Investigator: Dr. Ann Chapleau  
Award amount: $10,000  
With Pay for Performance, hospitals can no longer use the approved days per diagnosis to provide treatment and then discharge the patient when funding ceases; regardless of whether or not the patient/consumer is ready for discharge, hospitals are now financially responsible when a patient/consumer requires re-admission after discharge. As a result, health care organizations are looking for mechanisms to ensure patient improvement is well-documented and substantiated. The Goal Attainment Scaling (GAS) App allows each user in multiple departments, such as a therapist or dietician, to set goal scales, to re-evaluate, and review statistical reports on their assigned clients. Departmental managers and/or administrative staff can have access to all goal setters under their supervision allowing them to generate program and organization-wide reports reflecting changes in levels of goal attainment over time. School systems can also use the GAS App in a similar manner to document and monitor progress toward Individualized Education Plan (IEP) goals.

THE NEOVENT: DEVELOPMENT OF LOW COST, ALTERNATIVE RESPIRATORY CARE DEVICES  
Principal Investigator: Dr. Peter Gustafson  
Award amount: $20,000  
Presently, a large and ongoing need exists in less affluent regions of the world for respiratory devices that help the breathing of premature babies. If left untreated, premature babies have a high risk of developing Respiratory Disease Syndrome, which can progress to chronic lung disease; or worse, it can be fatal. Continuous Positive Airway Pressure (CPAP) therapy can be used for babies with limited Respiratory Distress. However, babies with moderate to severe respiratory distress require dual level air pressure therapy using a device that is expensive and requires an uninterrupted electrical supply. In contrast, NeoVent provides minimally invasive, dual level, positive airway pressure treatments for premature babies without need for a constant electrical supply and costing a fraction of existing dual level, air pressure devices. NeoVent works by attaching to bubble CPAP devices, providing regions that currently only offer CPAP therapy a way to easily expand their services.

THE WIGGLETRON FOR RAPID MEASUREMENT OF BLOODBORNE MICROFILARIA POPULATIONS IN STANDARD BLOOD COLLECTION MICROCAPILLARY TUBES  
Principal Investigator: Dr. Robert Eversole  
Award amount: $10,000  
There are over a billion people in the world who are at risk for filarial disease caused by nematode infections. Mass drug treatment programs to treat filarial diseases exist in almost every endemic area in the world. Program effectiveness is limited by the high cost for clinical monitoring of treatments. Present monitoring, microscopic analysis of nematodes, is expensive and motility measurement of late stage, large worms, is inaccurate. An experimental device, called a Wiggletron, converts the motion of early and late stage nematodes into electrical waveforms. The waveforms can provide an accurate estimate of the number of viable parasites present in the sample. This project will modify the Wiggletron to create a sample testing chamber that can hold and analyze standard blood collection tubes that are used everywhere, making field testing of blood and water samples a one step process using the Wiggletron.

LASER AUGMENTED DIAMOND DRILLING (LADD)  
Principal Investigator: Dr. John Patten  
Award amount: $20,000  
Current materials used in advanced manufacturing need to be lighter and mechanically harder, while being manufactured with high level precision and accuracy. Brittle and hard materials, such as composites, ceramic and semiconductors, are a challenge for drilling without creating fractures, surface damage, cracks and micro-cracks. Use of these materials is limited because of the high cost and low efficiency of current drilling techniques. The Laser Augmented Diamond Drilling (LADD) process utilizes a diamond drill bit tip and laser heating to reduce the hardness and brittleness of the work piece. The laser is focused through the hollow drill bit and diamond tip, increasing the material removal rate, decreasing tool wear, and eliminating surface and sub-surface damage during drilling. This project will create an industrial version of LADD with standard components compatible with industrial drills.
Dr. Jessaca Spybrook is the 2016 recipient of this award. The honor is bestowed on faculty members who are in the first decade of their WMU careers and are among the rising stars in U.S. higher education. It acknowledges the contributions of those who have achieved national recognition and demonstrated outstanding promise to achieve renown in their continuing work.

Spybrook has been a WMU faculty member since 2008. She was chosen from nominees across campus because of her roles as an education researcher, journal editorial board member and reviewer, grant program reviewer, consultant for research projects, and workshop presenter.

She recently received a National Science Foundation grant to head a team of researchers that will mine and analyze a treasure trove of large-scale data sets to come up with ways to inform the design of large evaluations of teacher development initiatives. Spybrook also recently received a fellowship through which she is leading a registry project that will improve the structure and availability of information on impact studies in education.

“Dr. Spybrook is a productive and influential scholar,” wrote a fellow WMU education researcher, noting her work has been published in more than 20 scholarly, peer-reviewed journals and she has served as the principal investigator or co-PI for research projects totaling about $3 million. “As a methodologist in statistics, Dr. Spybrook’s impact goes beyond the discipline to reach the community and society at large.”

Her nomination also was enthusiastically supported from outside WMU, and several nominators stressed that Spybrook has garnered significant international and professional recognition.

“The strength of Jessaca’s scholarship, its impact on the fields of both education research and public policy analysis, and the broad recognition of her contributions to the field among the nation’s top applied statisticians and intervention researchers make Jessaca highly deserving of such an award,” wrote a colleague at the University of Pennsylvania.
The Undergraduate Research Excellence Award provides undergraduates with research experience. Selected students receive $500 toward a stipend, travel, or supplies for a mentored research project or creative activity experience with externally funded faculty. Under the program, faculty subsequently may apply for up to $200 for additional supplies to support the student’s work.

Ajoku, David
Aerospace Engineering
The Magnetic Ternary Phase Diagram of NiMnGa Alloys
Faculty Mentor: Dr. Kristina Ari-Gur

Ajoku, David
Aerospace Engineering
Powering and Actuating Aircraft Wings Using Shape Memory Alloys
Faculty Mentor: Dr. Kristina Ari-Gur

Baines, Tyler
Aerospace Engineering
CubeSat Ground Station
Faculty Mentor: Dr. Jennifer Hudson

Baird, Matthew
Mechanical Engineering
Xenon Injection System for Hall Effect Thruster
Faculty Mentor: Dr. Jennifer Hudson

Barnett, Joseph
Biomedical Sciences
Neolvent: Development of Low Cost Respiratory Equipment
Faculty Mentor: Dr. Peter Gustafson

Beuerle, Steven
Mechanical Engineering
Design of a Tandem Rotor Ground-Effect Vehicle
Faculty Mentor: Dr. Jun-Seok Oh

Blais, Paul
Aerospace Engineering
High-Endurance Helicopter for Towing Capabilities
Faculty Mentor: Dr. Jun-Seok Oh

Brooks, Samuel
Biological Sciences
Optimizing Sample Preparation for Hops Analysis Laboratory
Faculty Mentor: Dr. Andre Venter

Bruinsma, Matthew
Mechanical Engineering
Training of Research Scientists from CMIT, India
Faculty Mentor: Dr. Muralidhar Ghantasala

Buck, Jared
Engineering Design Technology
3D Bone Surgery Simulator with Force Feedback Device
Faculty Mentor: Dr. Pavel Ikonomov

Carson, Cameron
Mechanical Engineering
Balloon Altitude Control Mechanism
Faculty Mentor: Dr. Kristina Lemmer

Chang, Jeremiah
Biomedical Science
Restoring Belowground Soil Microbial Function
Faculty Mentor: Dr. Kathryn Docherty

Conigliaro, Anthony
Civil Engineering
Evaluating Operational Status of the Freeze-thaw Machine
Faculty Mentor: Dr. Ulup Attanayake

Crumm, Ian
Biochemistry
The Identification of Bacteriophages For Use as Phage Therapy
Faculty Mentor: Dr. Silvia Rossbach

Curran, Christopher
Mechanical Engineering
Hydrogen Conversion for Internal Combustion Engines
Faculty Mentor: Dr. Muralidhar Ghantasala

Dixon, De’Lon
Behavioral Science and Criminal Justice
Interview-Based Behavioral Assessment of HIV Drug Users
Faculty Mentor: Dr. Anthony DelFulio

Farhad, Muqeat
Aerospace Engineering
Balloon Altitude Control Mechanism
Faculty Mentor: Dr. Kristina Lemmer

Foster, Michael
Manufacturing Technology
3D Bone Surgery Simulator with Force Feedback Device
Faculty Mentor: Dr. Pavel Ikonomov

Genovese, Weston
Mechanical Engineering
Hydrogen Conversion for Internal Combustion Engines
Faculty Mentor: Dr. Muralidhar Ghantasala

Haji, Maghreth
Aerospace Engineering
Shape Memory Alloys (Nano-Composite)
Faculty Mentor: Dr. Pnina Ari-Gur

Harmon, John
Aerospace Engineering
Validation of the MKV Aeroship through Flight Testing
Faculty Mentor: Dr. William Liou

Harvey, Paul
Civil Engineering
Infrastructure and Technology for Sustainable Livable Cities
Faculty Mentor: Dr. Ulup Attanayake

Hoin, Spencer
Engineering Design Technology
3D Bone Surgery Simulator with Force Feedback Device
Faculty Mentor: Dr. Pavel Ikonomov

Jones, Joshua
Manufacturing Engineering Technology
Western Michigan University’s Hybrid 3D Metal Printer
Faculty Mentor: Dr. Pavel Ikonomov

Kawka, Joseph
Aerospace Engineering
Validation of the MKV Aeroship through Flight Testing
Faculty Mentor: Dr. William Liou

Kostich, Brent
Mechanical Engineering
Tandem Rotor Ground-Effect Flight Vehicle
Faculty Mentor: Dr. Jun-Seok Oh

Lloyd, Nathan
Construction Engineering
Automation of the Autogenous Shankage Test Apparatus
Faculty Mentor: Dr. Ulup Attanayake

Mehdi, Syed
Aerospace Engineering
Altitude Control Mechanism
Faculty Mentor: Dr. Kristina Lemmer

Monaco, Michael
Biomedical Science
Bacteriophage Therapy
Faculty Mentor: Dr. Silvia Rossbach

Murawski, Anthony
Aerospace Engineering
CubeSat Ground Station
Faculty Mentor: Dr. Jennifer Hudson

Pietrowicz, Eric
Electrical Engineering
Smart Canes
Faculty Mentor: Dr. Pavel Ikonomov

Proctor, Christopher
Aerospace Engineering
Development of an Autonomous Proximity Operations Demonstration System
Faculty Mentor: Dr. Jennifer Hudson

Rudell, Nicholas
Biomedical Science
Study of the Unusual Reactivity of 1H-Pyrazole-3-Carboxaldehyde with Activated Pyrazoles and Development of Novel Highly Fluorescent Materials
Faculty Mentor: Dr. Gellert Mezei

Schmidtke, Zachary
Biomedical Science
Bacteriophage Isolation
Faculty Mentor: Dr. Silvia Rossbach

Simmons, Nagual
Mechanical Engineering
Magnetic Lens Configuration and Design
Faculty Mentor: Dr. Kristina Lemmer

Taylor, Timothy
Mechanical Engineering
Balloon Altitude Control Mechanism
Faculty Mentor: Dr. Kristina Lemmer

Thompson, Joel
Mechanical Engineering
Physical Modeling for Hall Effect Thruster
Faculty Mentor: Dr. Kristina Lemmer

Updegraff, Alex
Manufacturing Engineering Technology
Western Michigan University’s Hybrid 3D Metal Printer
Faculty Mentor: Dr. Pavel Ikonomov

Vande Streek, Benson
Manufacturing Engineering Technology
3D Bone Surgery Simulator with Force Feedback Device
Faculty Mentor: Dr. Pavel Ikonomov

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The Graduate Student Research Fund and Travel Grant, fully funded and administered by the Graduate College, supports graduate students engaged in independent scholarly research, scientific inquiry, inventive technology and original artistic activity. The fund is intended to help students pay extraordinary or unusual costs incurred in research projects. Grants range up to $1,000 and students may apply for up to $600 of additional support to defray the cost of international travel.

*Indicates student received additional funding for international travel.

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Abdullah, Osamah A.
Electrical and Computer Engineering
Travel
A Probability-Neural Network-Jensen-Shannon Divergence for a Fingerprint Based Localization

Abu Shattal, Mohammed Ali
Marzoug
Electrical and Computer Engineering
Research
Study of Applicability of Implementing Biological-Social Dynamic Spectrum Access System for Public Health Applications: Internet of Things Perspective

Ahmed, Basil
Mohammed Ahmed
Chemistry
Travel
Green Protection of Pyrazole, Catalytic Thermal Isomerization of Tetrydropropylnylypyrazoles, and Telecoping Synthesis of 3-Alkyl- and 3,5-Dialkylpyrazoles

Al Bayati, Ahmed J.
Civil and Construction Engineering
Research
Safety Challenges in the US Construction Industry: The Hispanic Workforce Perspective

*Al Bayati, Ahmed J.
Civil and Construction Engineering
Travel
Safety Challenges in the Construction Industry: The Hispanic Workforce Perspective

Al Isawi, Wisam
Abdulabss Flayyah
Chemistry
Travel
Effects of Volatile Aromas and Cotons as Spray Solvent Additives on the Desorption Electrospray Ionization-Mass Spectrometry (DESI-MS) Analysis of Proteins

Altay, Bilge Nazli
Chemical and Paper Engineering
Travel
A Sustainable Lignin Based Graphitic Carbon for Printed Electronics Applications

Altay, Bilge Nazli
Chemical and Paper Engineering
Travel
Smart Ink for Flexographic Printing

Al-Zubaidi, Hazim A.
Chemistry
Travel
Facile Design for Bimetallic Nanoparticles for Biomass Conversion

Aminayi, Payam
Chemical and Paper Engineering
Research
Development and Evaluation of Matrix Material Formulations for Potential Integration into Immunodiagnostic Biosensors

*Arnott, Megan Melissa
English
Travel
Female Characters’ Contributions of the Characterizations of Harold Hardrak

Barreto, Monica
Psychology
Travel
Acceptance and Commitment Therapy: Focused Brief Intervention for Health-Related Behavioral Changes

Bauer, Nicole E.
Psychology
Travel
The Effects of Different Methods of Data Collection on Place of Instruction in Behavior Aides in an Early Intensive Behavior Intervention (EIBI) Setting

*Bayne, Tyler W.
Electrical and Computer Engineering
Travel
Virtual Reality 3D Simulation of Concrete Compression Laboratory Experiment

*Beaver, Carol L.
Biological Sciences
Travel
Microbial Communities Associated with High Magnetic Susceptibility in Hydrocarbon-Contaminated Soils

Berkenpas, Joshua R.
Political Science
Travel
The “Behavioral Revolution” and the Great Transformation in Political Science

Black, Roland D.
Medieval Institute
Travel
The Condemned Prince in the Last Judgement Scene of the Bamberg Apocalypse

Boynton, Alicia M.
Biological Sciences
Research
Glial Cell Line Derived Neurotrophic Factor Protein Secretion by Skeletal Muscles is Altered by Activity of L-Type Calcium Channels

Brahma, Dweepobotee
Economics
Research
Housing Market Impact of the 2010 Kalamazoo River Oil Spill

Bre’z, Skylar J.
History
Research
“What We Do About History Matters”: National Women’s History Month and the Marginalization of Women’s History

Brubaker, Thomas C.
Geosciences
Travel
Mystery of Icylces: An Approach Based on Stable Isotope Studies

Bulla, Andrew J.
Psychology
Travel
Religious Discrimination and Inclusion in Los cautivos de Argel

Burke, Andrew L.
Biological Sciences
Research
Investigation of Antibiotic Resistant Bacteria Across Various Land Use Types

Carter, Diana L.
Biological Sciences
Travel
Land use Alters the Microbiome of Wild Birds

Chalhawai, Amer A.
Electrical and Computer Engineering
Research
Printed Flexible Dry ECG Electrode Sensors

*Clay, Andrew C.
Counselor Education and Counseling Psychology
Travel
“I may have closed the door on it.” ADRD Caregiver Grief Following Facility Placement

Deochand, Neil
Psychology
Travel
Lessons Learned from Opening an Intensive Residential Treatment Program for Children With Autism

*Dogras, Javon M.
Psychology
Research
Basic Education and Beyond: The Role of NGOs in Educational Access and Preparation

Egorova, Irina
Physics
Travel
Electric Dipole Excitations in Calcium Isotopes

Emamian, Sepehr
Electrical and Computer Engineering
Travel
Fully Printed and Flexible Piezoelectric Based Touch Sensitive Skin

Fernandez, Alba
Spanish
Travel
Religious Discrimination and Inclusion in Los cautivos de Argel

Ford, Chasse M.
Geosciences
Research
Use of Stable Isotopes of Oxygen and Hydrogen to Characterize Groundwater-Surface Water Oatenation in the Headwater of the White River, Manistee National Forest, Michigan

*Garrett, Jonathan D.
Geosciences
Research, Travel
Use of Persistent Scatterer Interferometry to Assess Land Deformation in the Nile Delta of Egypt and its Controlling Factors

Gebremichael, Esayas G.
Geosciences
Research
Travel
The “Behavioral Revolution” and the Great Transformation in Political Science

Hagge, Marlies
Psychology
Travel
A Look Behind the Curtain of Behavior Based Safety: A True Story About Observations, Behavior Change, and Incident Reductions

Heath, Caroline E.
English
Travel
Sewanee Writers Conference

Herr, Keli A.
Psychology
Research
Sex Differences in Discriminative Stimulus Effects of LSD in Adult Sprague-Dawley Rats

Hodges, Hannah R.
Speech Pathology and Audiology
Research
The Influence of Caffeine on Functional Balance Measures
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The Support for Faculty Scholars Award provides up to $2,000 in support of creative activities and research that may not lead to external funding but that enhance and sustain the scholarship of WMU and faculty investigators.

Beane, Wendy
Biological Sciences
Comparative Analysis of Tissue Remodeling During Planarian Regeneration

Blair, Jeremy
Dance
Sidra Bell Dance New York
Winter Module Choreographic Workshop

Brown, Lori
Flight Science
The Use of Augmented Reality in Technology Driven Training

Burns, Stephanie
Counselor Education and Counseling Psychology
Counselor Educator’s Perceptions of Boundary Crossings with Students

Choudhury, Alamgir
Engineering Design, Manufacturing and Management Systems
Effect of Operating Parameters on Energy Efficiency Of A Hydraulic System

Christian, Sue Ellen
School of Communication
A User’s Guide to Everyday Media Literacy

Cundiff, Patrick
Sociology
Erasing the Mark of a Criminal Record: The Impact of Education On Ex-Offender Employment

Damashek, Amy
Psychology
Evaluation of a Computer-Based Depression Treatment for Pregnant and Postpartum Women

Dichter, Heather
Human Performance and Health Education
Bidding for the 1968 Olympic Games: International Sport’s Cold War Battle with NATO

Docherty, Kathryn
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Long-Term Response of Microbial Communities to Multiple Climate Change Factors

Famiano, Michael
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Finding the Nuclear Equation-of-State Using Stellar Elemental Abundances

Gapova, Elena
Sociology
National Activist Communities in Post-Socialist Belarus in Cyberspace and Beyond

Harkness, Edward
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Bronze Cast Orbs

Levin, Mariana
Mathematics
Characterizing Instructional Approaches to Facilitating the Transition to Proof in Mathematics: A Pilot Study

Linn, Cindy
Biological Sciences
Activation of Nicotinic Acetylcholine Receptors Leads to Proliferation of Adult Mammalian Retinal Neurons

Maury, Nichole
Fratic School of Art
The Archive Project

Miles, Ann
Sociology
Chronicking Illness Over the Life Course

Reeling, Carson
Economics, Environmental and Sustainability Studies
Valuing Natural Resources Allocated by Preference Point Lottery

Roederer, Silvia
School of Music
International Connections 2: CD of New Works Written for the Verdehr Trio

Schroeter, Daniela
School of Public Affairs and Administration
Evaluation Competencies in Public Administration

Smith, Jesse M.
Sociology
Self, Narrative, and Congregation: Worship Services at the LDS Church

Steinke, Jocelyn
School of Communication
Cultural Representations of Gender and Science: Portrayals of STEM Professionals in Popular Films 2002-2014

Suarez, Michelle
Occupational Therapy
Narratives of Women Migrant Farm Workers in West Michigan

Vocke, Karen
English
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Villalobos, Cole
Civil Engineering
Evaluating Operational Status of the Air-Void System Analysis Machine
Faculty Mentor: Dr. Upul Attanayake

Wall, Tyler
Aerospace Engineering
High-Endurance Helicopter for Towing Capabilities
Faculty Mentor: Dr. Jun-Seok Oh

Watza, Spencer
Aerospace Engineering
Development of an Autonomous Proximity Operations Demonstration System
Faculty Mentor: Dr. Jennifer Hudson

Welton, Travis
Mechanical Engineering
Solar Powered Water Filtration System
Faculty Mentor: Dr. Muralidhar Ghantasala

Wewengkang, Patrick
Aerospace Engineering
Validation of the MKV Aeroship through Flight Testing
Faculty Mentor: Dr. William Liou

Wright, Casey
Biochemistry
A Guided Inquiry Approach to Enforce Student Understanding of Thin Layer Chromatography in the Organic Chemistry I Laboratory Course
Faculty Mentor: Dr. Megan Grunert Kowalski

Zeeb, Amanda
Aviation Flight Science
PAA Pegasus WTIC Project C, General Aviation Weather Alerting
Faculty Mentor: Professor Lori Brown
2014-15
7 AWARDS
$310,443 in awards
$374,725 in expenditures

2015-16
18 AWARDS
$3,010,387 in awards
$558,891 in expenditures

All Faculty Publications from July 2010 to June 2015 by Academic year and Publication Type

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med.wmich.edu/research/research-activities/publications
## EXTERNAL AWARDS TO FACULTY AND STAFF  
(JULY 1, 2015 THROUGH JUNE 30, 2016)

Funding provided by government, foundations, and industry to support discovery at the University.

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Garza Mitchell, Regina  
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Center for Research on Instructional Change in Postsecondary Education  
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Sindrome Health Center  
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The Children's Place  
Michigan Department of Education  
$3,699

Grant, Janos L.  
Electrical and Computer Engineering  
Abdel-Qader, Ikhlas  
Electrical and Computer Engineering  
Bazuiu, Bradley J.  
Electrical and Computer Engineering  
Western Michigan University Homer Stryker M.D. School of Medicine  
$28,767

Greene, Timothy J.  
Provoost and Vice President for Academic Affairs  
Fetter, Marcia K.  
Teaching, Learning and Educational Studies  
Mingus, Tabitha Young  
Mathematics  
The Woodrow Wilson National Fellowship Foundation  
$54,000

Grunert, Megan Leanne  
Chemistry  
Stapleton, Susan R.  
The Graduate College  
Steinke, Jocelyn D.  
School of Communication  
National Science Foundation  
$10,262

Gupta, Ajay K.  
Computer Science  
National Science Foundation  
$28,251

Harrison III, William B.  
Geosciences  
U.S. Geological Survey  
$34,879

Hartmann, David J.  
Sociology  
County of Kalamazoo  
$11,378

Hartmann, David J.  
Sociology  
County of Kalamazoo  
$11,378

Hartmann, David J.  
Sociology  
County of Kalamazoo  
$11,378

Hartmann, David J.  
Sociology  
County of Kalamazoo  
$11,378

Hartmann, David J.  
Sociology  
County of Kalamazoo  
$11,378

Hartmann, David J.  
Sociology  
County of Kalamazoo  
$11,378

Hassan, Wafa N.  
World Languages and Literatures  
U.S. Department of Defense  
$82,046

Hassan, Wafa N.  
World Languages and Literatures  
Qatar Foundation International  
$47,162

Henderson, Charles R.  
Center for Research on Instructional Change in Postsecondary Education  
Beach, Andrea L.  
Educational Leadership, Research and Technology  
University of Texas at Austin  
$77,121

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Hudson, Jennifer  
Mechanical and Aerospace Engineering  
U.S. DEPARTMENT OF DEFENSE  
$41,119

Hudson, Jennifer  
Mechanical and Aerospace Engineering  
FORD MOTOR COMPANY  
$40,000

Kayani, Asghar  
Physics  
ARGONNE NATIONAL LABORATORY  
$15,000

Kehew, Alan  
Geosciences  
Thakurta, Joyashish  
Geosciences  
U.S. GEOLOGICAL SURVEY  
$104,576

Kehew, Alan  
Geosciences  
Yellich, John  
Geosciences  
U.S. GEOLOGICAL SURVEY  
$72,499

Kim, Dae Shik  
Blindness and Low Vision Studies  
U.S. DEPARTMENT OF EDUCATION  
$149,584

Kohler, Paula D.  
Vice President for Research  
UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE  
$423,105

Kohler, Paula D.  
Vice President for Research  
CALIFORNIA STATE UNIVERSITY-NORTHridge  
$195,518

Kominsz, Michelle  
Geosciences  
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK  
$68,626

Kominsz, Michelle  
Geosciences  
COLUMBIA UNIVERSITY IN THE CITY OF NEW YORK  
$11,831

Koretzky, Carla M.  
Lee Honors College  
Docherty, Kathryn M.  
Biological Sciences  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
$37,262

Korista, Kirk T.  
Physics  
SPACE TELESCOPE SCIENCE INSTITUTE  
$5,587

Kuersten, Ashlyn K.  
Sociology  
Hurwitz, Mark S.  
Political Science  
U.S. DEPARTMENT OF JUSTICE  
$418,099

Kuwajski, Daniel  
Mechanical and Aerospace Engineering  
OFFICE OF NAVAL RESEARCH  
$76,892

Kwigizile, Valerian  
Civil and Construction Engineering  
Oh, Jun-Seok  
Civil and Construction Engineering  
Sun, Zhanbo  
Civil and Construction Engineering  
MICHIGAN DEPARTMENT OF TRANSPORTATION  
$209,832

Kwigizile, Valerian  
Civil and Construction Engineering  
Oh, Jun-Seok  
Civil and Construction Engineering  
Cho, Hyunkeun  
Statistics  
MICHIGAN DEPARTMENT OF TRANSPORTATION  
$161,802

Kwigizile, Valerian  
Civil and Construction Engineering  
Oh, Jun-Seok  
Civil and Construction Engineering  
MICHIGAN OFFICE OF HIGHWAY SAFETY PLANNING  
$104,015

Kwigizile, Valerian  
Civil and Construction Engineering  
Akamu, Abiola A.  
Civil and Construction Engineering  
Oh, Jun-Seok  
Civil and Construction Engineering  
MICHIGAN OFFICE OF HIGHWAY SAFETY PLANNING  
$99,542

Kwigizile, Valerian  
Civil and Construction Engineering  
Oh, Jun-Seok  
Civil and Construction Engineering  
MICHIGAN DEPARTMENT OF TRANSPORTATION  
$3,500

Lindsey, Kathryn Gilbert  
Parent and Family Programs  
KALAMAZOO REGIONAL EDUCATIONAL SERVICE AGENCY  
$62,010

Ling, Tianshu  
Mechanical and Aerospace Engineering  
INNOVATIVE SCIENTIFIC SOLUTIONS, INC.  
$43,000

Liu, Larry A.  
Engineering Design, Manufacturing and Management Systems  
Lyth, David M.  
Engineering Design, Manufacturing and Management Systems  
STRYKER MEDICAL  
$88,475

Malott, Richard W.  
Psychology  
KALAMAZOO REGIONAL EDUCATIONAL SERVICE AGENCY  
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Family and Consumer Sciences  
Zinser, Richard W.  
Family and Consumer Sciences  
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$10,000

Mansberger, Nancy B.  
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Burt, Walter L.  
Educational Leadership, Research and Technology  
U.S. DEPARTMENT OF EDUCATION  
$1,033,974

McGrew, Timothy  
Philosophy  
UNIVERSITY OF OXFORD  
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Meade, David J.  
Industrial and Entrepreneurial Engineering and Engineering Management  
Patten, John A.  
Industrial and Entrepreneurial Engineering and Engineering Management  
VARIOUS INDUSTRIES  
$25,000

Meade, David J.  
Industrial and Entrepreneurial Engineering and Engineering Management  
Patten, John A.  
Industrial and Entrepreneurial Engineering and Engineering Management  
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$25,000

Means, Stephanie N.  
The Evaluation Center  
$4,782

Meyer, Donald J.  
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$6,000

Meyer, Richard T.  
Mechanical and Aerospace Engineering  
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Human Performance and Health Education  
BRONSON ORTHOPEDIC AND SPORTS MEDICINE  
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Miller, Michael G.  
Human Performance and Health Education  
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Miller, Michael G.  
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Miller, Michael G.  
Human Performance and Health Education  
ALLEGAN GENERAL HOSPITAL  
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Auxiliary Enterprises  
VARIOUS INDUSTRIES  
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Mr. Shawn Mortimore  
Auxiliary Enterprises  
VARIOUS INDUSTRIES  
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VARIOUS INDUSTRIES  
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VARIOUS INDUSTRIES  
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VARIOUS INDUSTRIES  
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Mr. Shawn Mortimore  
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VARIOUS INDUSTRIES  
$2,310

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Oh, Jun-Seok  
Civil and Construction Engineering

Abudayyeh, Osama  
Civil and Construction Engineering

Kwigizile, Valerian  
Civil and Construction Engineering

Kim, Dae Shik  
Blindness and Low Vision Studies

Ofori-Amoah, Benjamin  
Geography

Van Houten, Ron  
Psychology

U.S. DEPARTMENT OF TRANSPORTATION

$469,600

Oh, Jun-Seok  
Civil and Construction Engineering

Kwigizile, Valerian  
Civil and Construction Engineering

Patten, John A.  
Mechanical Engineering Design, Manufacturing

Bennett, David Clark  
Vice President for Research

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Peterson, Stephen M.  
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PETERSON, STEPHEN M.

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KALAMAZOO COMMUNITY MENTAL HEALTH SERVICES

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KALAMAZOO COMMUNITY MENTAL HEALTH SERVICES

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Special Education and Literacy

SUMMARY, SARAH

$30,280

Poling, Alan D.  
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U.S. DEPARTMENT OF DEFENSE

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Prieto, Diana M.  
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Saged, Fahad  
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Biological Sciences

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Spybrook, Jessaca K.  
Educational Leadership, Research and Technology

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Stapleton, Susan R.  
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Stapleton, Susan R.  
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Sydlik, Mary Anne  
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$15,000

Sydlik, Maryanne  
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Sayed, Fahad  
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Computer Science

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$90,596

Sayed, Fahad  
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Ruhf, Robert J.  
Mallinson Institute for Science Education  
MICHIGAN TECHNOLOGICAL UNIVERSITY  
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Sydlik, Maryanne  
SAIMPI  
Ruhf, Robert J.  
SAIMPI  
MICHIGAN STATE UNIVERSITY  
$6,074

Tanis, John A.  
Physics  
Kayani, Asghar  
Physics  
NATIONAL SCIENCE FOUNDATION  
$48,304

Tenney, Shawn L.  
Center for Academic Success Programs  
Gogan, Brian James  
English  
MICHIGAN CAMPUS COMPACT  
$4,968

Thompson, Raymond  
College of Aviation  
Nicolai, Dominic  
College of Aviation  
GENERAL ELECTRIC COMPANY-GE AVIATION  
$11,336

Unrau, Yvonne  
Center for Fostering Success  
THE KRESGE FOUNDATION  
$700,000

Van Houten, Ron  
Psychology  
MICHIGAN DEPARTMENT OF TRANSPORTATION  
$24,000

Van Houten, Ron  
Psychology  
UNIVERSITY OF MINNESOTA  
$24,000

Van Houten, Ron  
Psychology  
UNIVERSITY OF MINNESOTA  
$16,740

VanZoest, Laura R.  
Mathematics  
KALAMAZOO REGIONAL EDUCATIONAL SERVICE AGENCY  
$6,368

Venter, Andre  
Chemistry  
NATIONAL SCIENCE FOUNDATION  
$298,602

Wall Emerson, Robert  
Shawn  
Blindness and Low Vision Studies  
Anderson, Dawn  
Blindness and Low Vision Studies  
U.S. DEPARTMENT OF EDUCATION  
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Wartfield, Martha B.  
Vice President for Diversity and Inclusion  
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Watts, Bradley  
The Evaluation Center  
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Watts, Bradley  
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Way, Ineke F.  
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RESEARCH FOUNDATION OF THE CITY UNIVERSITY OF NEW YORK  
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Wertkin, Robert A.  
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Wertkin, Robert A.  
School of Interdisciplinary Health Programs  
WAYNE STATE UNIVERSITY  
$22,487

Wertkin, Robert A.  
School of Interdisciplinary Health Programs  
WAYNE STATE UNIVERSITY  
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Wingate, Lori A.  
The Evaluation Center  
UNIVERSITY OF WISCONSIN-MADISON INSTITUTE FOR RESEARCH ON POVERTY  
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Wingate, Lori A.  
The Evaluation Center  
CENTERS FOR DISEASE CONTROL AND PREVENTION  
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Harrison III, William B.  
Geosciences  
Kehew, Alan  
Geosciences  
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
$121,800

Yellich, John  
Geosciences  
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Geosciences  
The Importance of Geologic Study for the Application of Carbon Capture and Storage (CCS) in Otsego County, Michigan

Mark Webster  
Sponsor: Dr. Silvia Rossbach  
Biological Sciences  
Proliferation of Retinal Neurons in a Mammalian Model

Abduljaleel Al-Hasnawi  
Sponsor: Dr. Steven Carr  
Computer Science  
The Level of Polyanaromatic Hydrocarbon Contamination on the Kalamazoo River Shoreline Remains High Following the 2010 Enbridge Oil Spill

Wisam Al-Isawi  
Sponsor: Dr. Sherine Obare  
Chemistry  
The Impact of a Story-Based Lesson on Student Learning and Attitudes

Joshua Teo Lee Kuok  
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Geosciences  
Evidence for Recent Spring Activity on Mars

Janice Marie Fulford  
Sponsor: Dr. David Rudge  
Science Education  
The Impact of a Story-Based Lesson on Student Learning and Attitudes

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Science Education  
The Impact of a Story-Based Lesson on Student Learning and Attitudes

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Economics  
Returns to Global Human Capital: Evidence from the US Labor Market

Tai-Hsien Wu  
Sponsor: Dr. William Rantz  
Chemical and Paper Engineering  
A Numerical Approach to Investigate the Influence of Deformable Blockages on Blood Flow in an Elastic Vessel

The Technology Development Fund is an internal grant program to provide funding to further develop faculty inventions. As such, it represents the significant investment WMU has made to enhance the impact of WMU’s research through commercialization. The WMU IP Management and Commercialization Faculty Advisory Committee awarded four proposals for 2016.

Chapleau, Ann  
Occupational Therapy  
Goal Attainment Scaling: A Mobile App  
$10,000

Eversole, Rob  
Biological Sciences  
$10,000

Gustafson, Peter  
Mechanical and Aerospace Engineering  
The NeoVent: Development of Low Cost, Alternative Respiratory Care Devices  
$20,000

Patten, John  
Industrial and Manufacturing Engineering  
Laster Augmented Diamond Drilling (LADD)  
$20,000
The purpose of the Faculty Research and Creative Activities Award is to encourage and support faculty in significant research, rigorous scientific inquiry, original artistic activity, and inventive technology. Awards are made for up to $10,000 and require submission of an external funding proposal.

* Recipients were named in Jan. 2016; period of award funding is July 2016 through June 30, 2017.
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To learn more about WMU research or how to expand your participation, visit wmich.edu/research or contact us directly. Or for information on commercialization opportunities, visit wmfurf.org.

Daniel M. Litynski  
Vice President for Research  
(269) 387-8284  
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Associate Vice President for Research  
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sherine.obare@wmich.edu

While every effort has been made for accuracy, there is still the possibility for errors or omissions. We apologize for any that might occur. Please contact us with any corrections for our next issue.

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