



Spring 2008

Inquiry, Spring 2008

Office of Vice President for Research

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INQUIRY

OFFICE OF VICE PRESIDENT FOR RESEARCH

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OVPR MISSION

THE OFFICE OF THE VICE PRESIDENT FOR RESEARCH EXISTS TO SUPPORT THE EXTERNAL FUNDING INITIATIVES OF WMU FACULTY, STUDENTS, AND STAFF; TO ASSURE COMPLIANCE WITH ALL APPROPRIATE FEDERAL AND STATE REGULATIONS; AND TO ADVANCE THE OVERALL RESEARCH AGENDA OF THE UNIVERSITY.

WWW.WMICH.EDU/RESEARCH

SMART RESEARCH INTO RFID TAGS

Margaret Joyce, a professor in the department of Paper Engineering, Chemical Engineering and Imaging, with a multidisciplinary team of research engineers, gather together bi-weekly to discuss ways to print RFIDs (radio frequency identification) antennae and integrated circuits directly onto packages. Rather than using labels, the team is seeking an efficient method whereby the electronics are printed directly onto the packages.

Each individual brings his/her own expertise to the table to help find the solution. The team members work collaboratively to pool resources, exchange ideas, and think outside the box.

"Today's technological questions and problems require us to think differently," says Joyce. "Collaborative teams are the way of the future."

Universities are, by nature, multidisciplinary. Unlike businesses that segregate departments, universities openly discuss and share ideas, supporting this collaborative approach to problem-solving. Certainly at WMU, with the diverse faculty in paper engineering, chemical engineering and imaging, the technological expertise and desire is ripe. The applications for the technology are widespread.

Joyce, who brings her expertise on paper coating to the team, sees the RFID technology impacting the inventory management chain. The technology being developed by this team is also attracting attention from companies with interest in developing other printed electronic products such as intelligent packaging, solar cells, security documents, and lighted displays, to name a few applications.

Team members across the disciplines, besides Joyce, include: Drs. Bradley J. Bazuin, ECE; Valery Bliznyuk, PCI; Dan Fleming, PCI; Marian Rebos, Chemical Engineer, post doctorate; Erika



The team gathered before its biweekly planning meeting at CAES building, Parkview Campus.

Hrehorova, Chemical Engineer, post doctorate; Alexandria Sasha Perkarovicova, PCI; Gururaj Neelgurd, Polymer Chemist, post doctorate; and graduate students Abhinay Mahajan (PCI), James Atkins (PCI), and Amrith Ranganathan (CE).

"Printed electronics is forecasted to be the biggest technological revolution ever," says Joyce. "In terms of applications for the technology, the future is bright."

That WMU is poised to lead the way in this industry says a great deal about the quality of research and the caliber of minds working on this technology here on campus.

"Others have printed the antennae and inserted circuits on film, but to print directly on paper itself is key," remarks Joyce. "And that we as a team are working on this challenge means we are covering it from every conceivable angle."

Those interested in learning more about the research into smart products and printing may contact Dr. Margaret Joyce and her team, margaret.joyce@wmich.edu.

OVPR OFFERS GRANT DEVELOPMENT WORKSHOPS THROUGHOUT SPRING SEMESTER

As part of its mission to help faculty and staff launch successful research careers, the OVPR is again offering a series of workshops, open to all interested in the workshop topics, during spring semester.

The recent workshops discussed ways to successfully build a research career and offered proposal writing tips. In January, Dr. Susan Stapleton, associate dean of the CAS, and Dr. William Liou, director of CAViDS, discussed with participants ways to successfully build and maintain a research program.

In February the first of a series of three workshops began which offered participants advice on pro-

positional writing and how to orient them for specific funding agencies like the National Science Foundation, USDA, and the Department of Education.

The Grant Development Workshops take place on Fridays from 11:30 a.m. to 1 p.m. in Walwood Hall, East Campus. Other workshops and topics for the semester include:

- April 18, The Commercialization of Research Discoveries at WMU: An Overview

To register for the workshop session, contact Charlotte Kelley at 387-8205 or go online to register at the OVPR website (www.wmich.edu/research/workshop-registration.html). Check



Stapleton and Liou discuss with RDA participants how to build a research program in recent workshop.

the website periodically for information on workshops to be offered in Fall 2008 and to suggest ideas for topics of interest.

Also look for reminders of workshops to be posted on WMU Today (www.wmich.edu/events).

RESPONSIBILITIES OF A PI: SO YOU RECEIVED YOUR GRANT?

Receiving an external grant or contract is exciting. The project will allow you to advance your career and carry out your project.

When you signed the approval form, you agreed to carry out the project in accordance with the funding agency and WMU's requirements.

The principal investigators are contractually obligated to provide proper stewardship of the sponsored funds, submit technical reports and deliverables in a timely fashion, and disclose to the OVPR all inventions in accordance with federal policy or contractual terms.

In addition, maintenance and retention of data collected is the principal investigator's (PI) obligation. WMU's Intellectual Property policy, available at www.wmich.edu/research/

[forms/dataretention.doc](#) requires that raw data and notebooks be retained for at least 4 years beyond the project's completion. Some funding sources may require an additional retention period.

Records need to be in a form and in a place that the University and funding sources can access the data and interpret the information collected.

As PIs and project participants work on their projects, OVPR staff and Grants and Contracts staff is available to assist you in meeting the requirements of the grant.

Funding for research is an exciting and beneficial tool; care needs to be taken to ensure that the obligations and conditions of the funding contracts are fully followed and carefully met.

TECHNOLOGY DEVELOPMENT FUND AWARDS

The WMU IP Management and Commercialization Faculty Advisory Committee (IPMCC), after reviewing proposal submissions, awarded four faculty for three separate projects. The Technology Development Fund is a new internal grant program to provide funding to further develop faculty inventions.

Winners of the TDF Awards were the following faculty and projects: Dr. David Meade, "Multi-period financial simulator of a manufacturing operation," awarded \$16,500; Dr. Wuwei Shen, "An Eclipse-based Tool Supporting Class Model Development," awarded \$12,000; and Drs. Massood Atashbar and Bruce Bejcek, "Development of hybrid guided shear horizontal S.A.W. sensor instrumentation system for the detection of serum protein biomarkers," awarded \$19,000.

The Technology Development Fund is part of the University's efforts to support faculty research, inventions, and commercialization.

See the www.wmich.edu/research/technology-transfer for information on the Technology Development Fund.

TECHNOLOGY TRANSFER AND COMMERCIALIZATION AT WMU GROWING

Designated a high research institution by the Carnegie Foundation, WMU has an active faculty involved in research and commercialization. Research serves to enhance the quality of classroom teaching and student engagement in research projects of an applied nature. One example is the research of Dr. Mitchel Keil, a professor in the industrial and manufacturing engineering department within the College of Engineering and Applied Sciences. He is the inventor of the multi-channel fiber-optic rotary joint.

Keil's invention makes it possible to pass high volume information over optical fibers that, bundled on one end with a rotary joint, can be rotated to optimize signal strength and transmission to the other bundled optics thereby increasing from one to seven-fold the data transmitted along the fiber. Dr. Keil has been a member of WMU's faculty for over 10 years, contributing to the research community approximately 38 original publications. However, it was his prior working relationship with Moog Components Group that led to this invention. Moog contacted Dr. Keil after his departure from the company and asked him to work on the concept of a multi-channel fiber-optic rotary joint. It was a challenge that confounded the researchers at Moog, but they knew Keil understood how to approach the problem of aligning the fibers for the rotary joints so all the fibers would line up optimally in all conditions, and Moog wanted him to maximize the volume of data transmitted.

Keil's invention involves packing the fibers very precisely into ceramic tubes with precision lenses. The success of the rotary joint rested on figuring out how to align the center axis so as to keep the fibers at each end of the joint speaking to each other. The technology Keil uses builds off the technology used in submarine periscopes – where the periscope rotates to scan the surface as the observer stands still – and gets the fibers talking to each other. The key to this invention is that there is no loss of communication or data when the fibers on each end of the joint rotate. Patented in 2001 as US 6,301,405, these joints rotate and are linked in such a fashion as to bring the fiber optic strands into optimal signal strength at all times. This technology is used in ships, submarines, cars, aircrafts [MK1] and anywhere there is need to pass high volumes of information efficiently in a small space between a fixed object and a rotating object. In short, the multi-channel fiber-optic rotary joint increases the amount of information that can pass through a physically small space.

Dr. Keil's invention is sold currently by Moog Components Group. Based on a commercialization arrangement with Moog, Western Michigan University and Dr. Keil receive royalties from the sale of this product which can be used to support more research at the University. It is the goal of WMU's OVPR, through its Intellectual Property management and commercialization arm, to help create more of these kinds of relationships with industry.

OVPR OFFERS UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM

University students today expect to gain much from their undergraduate education, including the opportunity to research and partner with faculty mentors. Western Michigan University, as a designated high research institution by the Carnegie Foundation, has recently centralized undergraduate research opportunities through a new program in the Office for the Vice President for Research.

The new Undergraduate Research Opportunity Program website (UROP) has a list of programs across campus that support undergraduate research.

"We have many wonderful opportunities for undergraduates here at WMU," says Dr. Leonard Ginsberg, interim vice president for research. "One of these opportunities is to work with faculty members who have received external funding for their project. To be eligible for the award, the faculty member must currently have external funding."

As a way to encourage faculty in their efforts to mentor students in research projects, the OVPR has launched the *Undergraduate Research Excellence Award* with a two-fold goal of offering students mentored research and creative activities related experience and to provide individual students with \$500 for use as a stipend, or for travel or supplies/expenses for a semester or

two term experience.

It is recommended that currently funded faculty seek out undergraduates for the program. In addition to getting support for students and some help with their project, faculty may request up to \$200 for additional supplies needed to support the student. Details on the application process is available online at www.wmich.edu/research/undergraduate.

The Lee Honors College also offers a variety of research opportunities and, through the online site listed above, students may find details related to the Dean's Summer Research Thesis Grant and to the Seibert WMU Undergraduate Research and Creative Activities Award, which is open to all undergraduates with a GPA above 3.25.

The focus of the UROP is to underscore the importance that WMU places on student success, as evidenced in the University's *Western Edge*, and on faculty research.

When the students and faculty unite in a mentored faculty/student relationship, opportunities for educational growth and experience are realized. "The mission of the OVPR," states Ginsberg, "is to support the external funding



Walwood Hall, East Campus home of OVPR

initiatives of faculty, students, and staff. To the degree that we start students early in their undergraduate career in research projects, we maximize the overall research agenda of the University."

FACULTY SENATE APPROVES CHANGES TO FRACASF

At its March meeting, Faculty Senate approved the Research Policy Council's recommendations to change policies related to the Faculty Research and Creative Activities Support Fund (FRASASF).

RPC recommends that the purpose of the FRACASF is to encourage and support faculty in significant research, rigorous scientific inquiry, original artistic activity, and inventive technology. To this end, RPC recommended, and Faculty Senate approved, to portion the FRACASF into three programs: 1) replace the current *Preparation and Publication of Papers and Exhibition of Creative Work (PPP&E)* program with the **Support for Faculty Scholars Award (SFSA)**; 2) rename the *Faculty Research and Creative Activities Support Fund (FRACASF)* to the **Faculty Research and Creative Activities Award (FRACAA)**; and, 3) leave the **Faculty Research Travel Fund (FRTF)** as it currently is.

The purpose of the SFSA is to advance the research mission of the University. This award will support creative activities and research that will enhance the scholarly reputation of WMU and principal investigators.

FRACAA exists to support external funding here at WMU. To that end, recipients of this annual award will be required to apply for external funding within 18 months of receiving a FRACAA.

Thirty-one faculty have been named as recipients of the 2008-2009 FRASCAF awards. A full list of the recipients is available online at www.wmich.edu/research.

The Research Policies Council will gather input from faculty until April 15 before establishing initial submission procedures and award levels and other program details for AY 2008-09. To offer input to the RPC on the SFSA and FRACAA awards, contact Paula Kohler, chair of the RPC (<http://www.wmich.edu/facultysenate/councils/research/members.html>) with suggestions.

To read the full report submitted by the Research Council to Faculty Senate, go to <http://www.wmich.edu/facultysenate/senate/agendas/20080313.html> (click on MOA-08/03).

RESEARCH DEVELOPMENT AWARD RECIPIENTS ANNOUNCED FOR 2008- 2009

Seven faculty have been named as recipients of the 2008 –2009 Research Development Awards.

They are: Drs. **Li Yang**, Department of Geography; **Udaya Wagle**, School of Public Affairs and Administration; **Liang Dong**, Electrical and Computer Engineering Department; **Sharie Falan**, WMU Bronson School of Nursing; **Mary Lagerwey**, WMU Bronson School of Nursing; **Leszek Lilien**, Computer Science Department; **David Meade**, Industrial and Manufacturing Engineering; **Tom Rienzo**, Business Information Systems Department; and **Cladia Fajardo**, Mechanical and Aeronautical Engineering Department.

Each RDA recipient is awarded \$2500 for an 18-month period to

complete program activities that include attending workshops on grant seeking and foundations grants; meeting with mentor and research officer to define a research plan; participate in quality circle reviews of proposals; travel to Washington D.C. to meet with a sponsoring agency; and submit at least one proposal for federal support before December 2009.

The OVPR and research officers along with mentors are available to assist with research development and proposal submissions.

More information on the RDA program can be located at <http://www.wmich.edu/research>.

NSF GRANT DEADLINES FOR CCLI GRANTS

Faculty should be aware that the National Science Foundation's Division of Undergraduate Education has a grant deadline of May 20, 2008 for Course, Curriculum, and Laboratory Improvement (CCLI) grants.

The CCLI program is intended to improve educational opportunities for all students enrolled in science, technology, engineering, and mathematics (STEM) coursework.

Eligible projects include those that develop and initiate new learning materials and teaching methods, support faculty professional development in these areas, assess and evaluate learning, and conduct research on STEM educational endeavors. The program supports three different phases of development ranging from small, exploratory investigations to large, comprehensive projects.

Additional information can be obtained at http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5741 or from your Research and Program Officer.

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Gina Betcher: CAS (Humanities), CFA, COE, TGC, International Studies, HIGE.

Mary Anne Sydlík: CAS (Biology, Chemistry, Psychology, Sociology), LHC, CHHS.

Barb Wygant: CAS (Political Science, Public Administration), CAES, HCOB, Nano Research

A complete list of constituency areas is posted online. Check our website: (www.wmich.edu/research).