Looking into the FUTURE

SPRING 2012 ■ WOMEN IN RESEARCH AT OAKLAND UNIVERSITY

IN THIS ISSUE

Dear Friends,

Virinder K. Moudgil

Groundbreaking discoveries … effective, results-oriented research … creative, solution-driven ideas … these things do not just happen by chance. In order to create, research and achieve results, scientists and scholars require a supportive environment that provides the encouragement and resources they need to succeed. We believe our faculty researchers find that here at Oakland University.

Every year, OU invests more than $35 million in total internal and external research expenditures, including $18 million in federal awards; this supports research that finds the answers to important, impactful questions and solutions to life-changing challenges.

Among these external awards is a project we are very excited about: the Women in Science and Engineering at Oakland University (WISE@OU) project. Supported by a $518,000 National Science Foundation grant, this project will research faculty experiences, policies and procedures to assess ways to enhance OU as an environment where women and underrepresented minorities thrive. Coordinated and implemented by a cross section of OU leaders, WISE@OU will create a comprehensive program in recruitment, retention and career development that target women or under-represented minority faculty members and combat the initial challenges that can hold them back.

Within the pages of this newsletter you will read about WISE@OU and its focus on the STEM (science, technology, engineering and mathematics) disciplines as well as a number of individual research endeavors conducted by our extraordinary faculty members here on campus. These include exploring the effects of Title IX legislation, hypertension and diabetes studies, the existence of pathological altruism, and more.

At Oakland University, we are dedicated to this vitally important research, and I am proud to work for a university that continues to create an environment that supports excellent research opportunities along with exemplary academics.

Please enjoy this issue of *Looking Into the Future*.

Virinder K. Moudgil, Ph.D., Senior Vice President for Academic Affairs and Provost

Please welcome Dorothy Nelson, Ph.D., vice provost of research

To help lead our research efforts at OU, Dorothy Nelson, Ph.D., joined us last fall as vice provost for research and professor of anthropology. Dr. Nelson earned her Ph.D. in physical anthropology at Michigan State University. She began her research career at Henry Ford Hospital in the Bone and Mineral Research program, where she was awarded two grants from the National Institutes of Health (NIH) for her work on ethnic differences in skeletal health during growth and adulthood. Subsequently, Dr. Nelson joined the faculty at Wayne State University, continuing her research and scholarly activities, and eventually serving as associate vice president for research. She has notably served as a grant reviewer for NIH, the National Science Foundation and the Department of Defense, in addition to service on editorial boards of scientific journals. We are exceptionally proud to welcome Dr. Nelson to our research team.

(From left to right) Joi Cunningham, Kathleen Moore, Leanne DeVreugd, Brad Roth, Fatma Mili and Julie Walters make up the WISE@OU team.

Science grant, WISE@OU to help STEM initiative

Creating an environment that encourages women and underrepresented minorities to participate in the science, technology, engineering and mathematics (STEM) disciplines — that is the goal of the Women in Science and Engineering at Oakland University (WISE@OU) project. Supported by a $518,000 National Science Foundation grant, this project is researching faculty experiences and policies and procedures in order to assess ways to make OU an environment where women and underrepresented minorities thrive.

Spearheaded by a diagonal segment of leaders from Oakland University, WISE@OU will create a comprehensive program in recruitment, retention and career development that targets STEM women or under-represented minority faculty members and combats the initial disadvantages that tend to hold them back.

The leadership team includes program director Dr. Kathleen Moore, associate dean for the College of Arts and Sciences; Dr. Fatma Mili, professor of computer sciences; Dr. Brad Roth, professor of physics; Joi Cunningham, director of Office of Inclusiveness and Intercultural Initiatives; and Dr. Julie Walters, associate professor of political science. The team is assisted by Leanne DeVreugd, an OU MPA graduate. Dr. Jo Reger, associate professor of sociology, is program evaluator.

At present, just 18 percent of Oakland's faculty in the STEM disciplines are women. The WISE@OU team expects STEM faculty diversity to increase significantly as a result of this project.

Part of the efforts to advance career development for women faculty members will be the creation of mentoring relationships and increased educational opportunities focused on writing and submitting research grants — a critical part of career success in the STEM disciplines, according to Dr. Moore. She says the initiatives will benefit all faculty members through efforts to improve family and life policies at OU.

In addition to addressing its own faculty diversity issues, Oakland intends to share the strategies and interventions it finds successful with other educational institutions looking to achieve the same goal.

While the WISE@OU team's primary goal is to broaden the diversity of STEM faculty here, a secondary effect will have beneficial impacts far beyond the Oakland campus.

"It's really important that potential faculty and students see by way of our current faculty that there are opportunities for them to succeed in STEM careers," Dr. Moore said. "In that sense, what we're doing could have an exponential impact for women looking to work in the sciences."

For more information on WISE@OU, visit **oakland.edu/advance**. ✳

"In that sense, what we're doing could have an exponential impact for women looking to work in the sciences."

— **Kathleen Moore**

Hypertension, diabetes studies look to stop end-organ damage

Amy Banes-Berceli

Sometimes it's not the disease, but its effect that can kill you. Such is the case with diabetes and hypertension, which can often cause renal and vascular complications, and death.

Amy Banes-Berceli, assistant professor in Oakland University's Department of Biological Sciences, is conducting research on the development of disease complications in the vasculature and kidneys relating to diabetes and hypertension. She was awarded a grant from the National Institutes of Health that will support her efforts to investigate the role of the JAK2 protein in the development of hypertension.

"The main goals of my research are to understand the molecular mechanisms involved in the development of the renal and vascular complications of diabetes and hypertension. I am focusing on the family of the Janus kinases (JAK) and connected intercellular signaling pathways and their roles in these diseases and disease complications as well as the physiological functions," she explains, adding that to achieve these goals the researchers are using animal model physiological studies, cellular function studies, *ex vivo* myograph studies as well as biochemical and molecular biological techniques.

The ultimate goal, is to determine what medications can stop the progression of end-organ damage that frequently occurs in such patients.

"The current drugs being used for treatment on the market don't stop end-organ damage, they simply slow the damage down." she says. "If we can determine the mechanisms of the disease — how it develops and progresses — as well as how diet and exercise would affect and interact with certain drugs, we hope to determine better treatment practices."

Additionally, Banes-Berceli is working with Michael Brands, Ph.D., from the Medical College of Georgia and Carrie Northcott, Ph.D., from Michigan State University, along with Pam Marcovitz, M.D., and Scott Billecke, Ph.D., from Beaumont Health Systems on related studies. ✳

Research aims to broaden Title IX focus to include STEM professions

Say Title IX and most people think of its impact on female athletics.

Also known as the Patsy Mink Equal Opportunity in Education Act (1972), Title IX has been most visible in the increase in women's participation in athletics, opening educational opportunities that were previously closed to women. However, the law was also designed to enhance women's entry into all areas of education.

In recent years, questions concerning the underrepresentation of women in the science, technology, engineering and mathematics (STEM) professions have been central to debates on the role and makeup of the workforce in today's innovation-driven economy — and the role of Title IX.

Oakland University Associate Professor of Political Science Julie Walters recently completed research titled "Recasting Title IX: Addressing Gender Equity in the Science, Technology, Engineering, and Mathematics Professoriate." In her research, Dr. Walters characterizes and delineates the law's relevance to gender disparities in the STEM professoriate, identifying areas for policy consideration and future application. Walters, who holds both a law degree (J.D.) and a Ph.D. in public policy, says her research is a fusion of two related issues: civil rights concerns and the push to remain globally competitive in the STEM fields.

> *"A national public policy agenda exists … regarding the support and maintenance of a vibrant and diverse STEM workforce."*
>
> — **Julie Walters**

"A national public policy agenda exists, led by the executive branch, regarding the support and maintenance of a vibrant and diverse STEM workforce, as innovation and technological development are critical to remaining competitive in a global economy" she explains.

"My research contributes to a growing body of research aimed at understanding the historical and current policy environments in which STEM women and other traditionally under-represented groups receive education and employment," she says. "As public policy reflects the passage and administration of law, political activities, administrative rule-making, and social norms, studying its development in relation to women in the STEM professoriate is essential." ✳

Supportive university environment helps Googasian awardee succeed

The Phyllis Law Googasian Award honors and recognizes women who have contributed to the advancement of women at Oakland University through distinguished leadership, scholarship, advocacy, mentoring and program development. This year's recipient, Associate Professor of Engineering Laila Guessous, says the environment at Oakland University helps her achieve her goals and have an impact on the university community.

"From Day One, when I was interviewing for a position at OU, I knew this was a welcoming place where much could be accomplished. Once here I was only treated as a valued faculty member and my ideas and contributions were taken seriously," Guessous explains. "I also have worked with great mentors who helped me achieve a nice balance of research, teaching and service. It became my goal to pay back this wonderful experience in some way."

Michele Piskulich, associate provost and chair of the Googasian Award selection committee, says Guessous was chosen due to her leadership and mentoring of fellow faculty and students. "Engineering is still a pretty male-dominated field, but Dr. Guessous has used her own success in this area to support her colleagues and students. … The letters we received from students were very touching in the way they described her impact on their ability to realize their goals and dreams."

Known for her dedicated teaching style, Guessous joined OU in 2000. Her research and teaching interests lie in the areas of computational fluid dynamics and heat transfer, and include a balance of fundamental and applied research. Dr. Guessous also is highly involved on the Oakland University campus, including as a member of the Automotive Tribology Center at Oakland University — the only university research center in the United States that is dedicated to automotive tribology research and is uniquely positioned to advance the reliability, mobility and efficiency of automotive components.

Dedicated to research and, more important, to her students, Dr. Guessous has obtained ongoing National Science Foundation grants to host the Research Experience for Undergraduates program at Oakland University since 2006, and it will continue until at least 2013. In this 10-week program, the students perform research on energy-related topics under the supervision of Oakland faculty and industrial mentors, gaining hands-on experience and enthusiasm.

Outside the classroom, Guessous has personally mentored female students in this program, including arranging meetings with female automotive executives, so that they have quality industrial role models.

Laila Guessous

Acknowledgment of her efforts has come in many forms, such as the 2011 School of Engineering and Computer Science Outstanding Faculty Award for Teaching; the 2003 John D. and Dortha J. Withrow Teaching Excellence Award in the School of Engineering and Computer Science; and being nominated twice for the Oakland University Teaching Excellence Award. ✳

Research opportunities open to undergrad, minority students

George Martins

Taking part in academic research is a coveted experience. It's even more so when that student is an undergraduate. For undergrad students from underrepresented or disadvantaged minority backgrounds or economically depressed communities, such opportunities may be scarcer still.

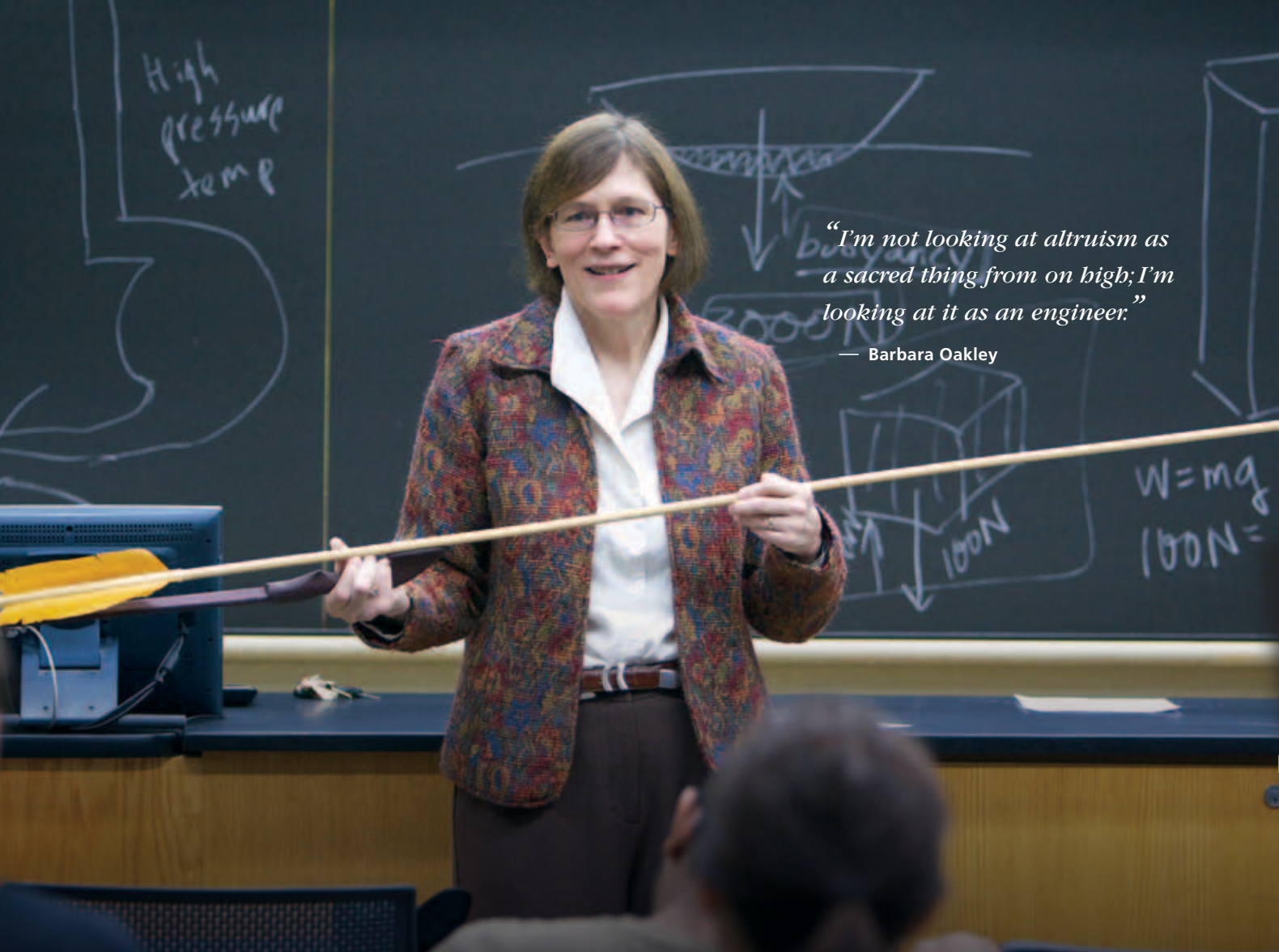
Thanks to funding from the National Science Foundation and outreach efforts by Oakland University, a large number of research opportunities are available to those students in the form of Research Experience for Undergraduates (REU) programs.

REUs currently provide opportunities for students to work alongside expert OU faculty in the areas of mechanical engineering, computer science and engineering, physics and electrical and computer engineering.

George Martins, Ph.D., associate professor of physics, is site director for the department's Summer Materials Research Training (SMaRT) program, which receives its funding through the NSF. For several years, he has been involved in outreach efforts that aim to interest minority students from nearby Pontiac public schools in pursuing science careers.

He notes that the objective of the department's REU program is to provide research opportunities to three distinct classes of students: high school seniors from economically depressed school districts near OU; community college students also neighboring OU with no access to research opportunities; and undergraduates of small colleges in Michigan who may have very limited access to research opportunities.

"The main target of SMaRT — and the broader impact of it — is not the REU students themselves, but their communities," explains Dr. Martins. "Once they realize that they can be the 'vector' that brings scientific information to their community, they feel empowered to acquire more and more knowledge, with the objective of spreading it among their peers." ✳



"I'm not looking at altruism as a sacred thing from on high; I'm looking at it as an engineer."

— **Barbara Oakley**

The good, the bad and the ugly of altruism

Can we be too empathic? Too helpful? Too nice?

According to *Pathological Altruism*, a book published last fall and co-edited by Oakland University Associate Professor of Engineering Barbara Oakley, we can.

The book, which grew in part out of research Oakley has conducted, presents a number of new, thought-provoking theses that explore a range of hurtful effects of altruism and empathy. Oakley's research at OU focuses on the complex relationship between social behavior and neuroscience. Her other published works include *Cold-Blooded Kindness* (Prometheus Books, 2011) and *Evil Genes* (Prometheus Books, 2007).

"As a people, we have focused on the benefits of altruism and lost sight of how it can go awry. If we are just giving things to others, we're not helping them — we need both the carrot and the stick," she says. "I'm not looking at altruism as a sacred thing from on high; I'm looking at it as an engineer."

And by the first rule of engineering, she said, "there is no such thing as a free lunch; there are always trade-offs. If you increase order in one place, you must decrease it somewhere else."

Oakley said pathological altruism can lead to burnout in services professions.

"Train nurses to be highly empathetic and, yes, their patients will love them. But studies show that empathetic nurses burn out and leave the profession more quickly than do their peers who remain aloof," she says.

Oakley has been invited to speak to the National Academy of Sciences at its annual Sackler Colloquium in January 2013. Her talk will focus on "Cold-Blooded Kindness — Insights into Pathological Altruism."

"It's virtually unheard of for an engineer to be invited to give a talk to the National Academy of Sciences, and it's a signal honor to be presenting to one of the most august scientific audiences in the world," she says. Oakley's accompanying paper will be published in the *Proceedings of the National Academy of Sciences.* ✳

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Back row left to right: Huirong Fu, Fatma Mili, Beth Zou, Xia Wang, Jing Tang. Front row left to right: Hoda Abdel Aty Zohdy, Laila Guessous, Barbara Oakley.

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Diverse engineering, computer science faculty has positive impact on students and OU

When universities hire a diverse faculty, it attracts other qualified faculty members and signals that its leadership has a progressive philosophy and proactive attitude. This is true of the School of Engineering and Computer Science (SECS), where the number of women faculty members indicates a rich working environment and where deans and chairs have been open and supportive.

"Diversity in the faculty ranks increases diversity of viewpoints and ideas and creates a congenial and intellectually vibrant school," Fatma Mili, professor and chair of the Department of Computer Science and Engineering, says.

In SECS, there are two to four women faculty members in most of the schools' four departments. These professors become role models and mentors to female students and often encourage them to complete their studies when the going gets rough.

"Letters of support from students told many stories of young women benefitting from such relationships and persevering in a field where they are a minority," Mili says.

SECS women faculty members regularly seek funding to support and broaden mentoring activities as well. The school has been granted four National Science Foundation REUs (Research Experiences for Undergraduates), three of which have women as the principal investigators and all are geared towards mentoring a diverse student body.

The recent recognition of Laila Guessous, associate professor of mechanical engineering, as the recipient of the Phyllis Law Googasian Award is testimony of the extensive mentoring and support among faculty, and from faculty to students. (See her profile in this issue.) ✳

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GCSR4152_7.11