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Michigan Tech

Michigan Technological University

DEPARTMENT OF **Biological Sciences**



Our Lab Experience Includes Getting Hands-On in the Field

FALL 2015

A Note from the Department Chair



Greetings from the Department of Biological Sciences! Since July 2013, I have been serving as department chair, but I am no stranger to Michigan Tech. I have spent 17 years in the School of Forest Resources and Environmental Science before coming to biology.

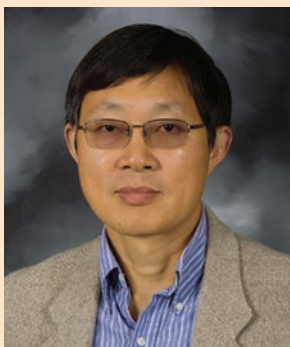
It's been an exciting time in the department with grants, awards, events, and publications. But, more importantly, it has been a year of

success for our colleagues and friends—a quick glance at the stories in this newsletter will tell you that.

We'd like to hear how your year has been, too. Get in touch with us at biology@mtu.edu or 906-487-2025. Or, even better, stop by the department the next time you're on campus. We'd love to see you.

Chandrashekhar Joshi

Guiliang Tang Obtains \$2.5M NSF Grant to Enhance Crop Genetics



Cereal crops may seem as simple as snap-crackle-pop, but in reality they are among the most complicated species in the plant world, at least from a genetics standpoint. As a result, scientists have been hard put to tease out what genetic mechanisms are responsible for which characteristics. But now a Michigan Tech biologist is leading a \$2.5 million project to do just that.

With support from the National Science Foundation, Associate Professor **GUILIANG TANG** and his colleagues at Kansas State University and the University of California at Riverside are undertaking a three-year study of key genetic

processes underlying three of the world's most important food crops: maize, rice, and soy. Ultimately, their discoveries could lead to the development of crops with higher yields and greater resistance to stressors.

Co-principal investigators on the research project, "Inactivation of microRNAs in Crop Plants Using Short Tandem Target Mimic (STTM) Technology," are Associate Professor Hairong Wei (SFRES) of Michigan Tech, Wenbo Ha and Howard Hughes Medical Institute Investigator Xuemei Chen of UC Riverside, and Harold Trick of Kansas State.

Huckins and Marcarelli Receive New Grants



Professor **CASEY HUCKINS** is the principal investigator on a research project that received a \$331,979 grant from the Michigan Department of Natural Resources. The project is titled Innovative and Multifaceted Control of Invasive Eurasian and Hybrid Watermilfoil Using Integrative Pest Management Principles. **AMY MARCARELLI** is a co-PI on this project, along with Erika Hersch-Green and the Michigan Tech

Research Institute's Colin Brooks. This funding is part of the new MDNR Michigan Invasive Species Grants Program.

Huckins, Marcarelli, Brooks, Rodney Chimner (SFRES), and Guy Meadows (GLRC) have received \$499,887 for a two-year research and development project "Arresting the Spread of Eurasian Watermilfoil in Lake Superior," from the US Environmental Protection Agency.

A team led by Marcarelli received \$50,000 from the University of Michigan Water Center to study the impact of remediation of stamp sands along Hills Creek on the Keweenaw Peninsula. Huckins is a co-investigator on the project.

Amy Marcarelli Receives NSF CAREER Award



In the world of aquatic biology, it's a long-held belief that what goes up must come down. As human activity causes nitrogen loads to go up along the banks of rivers and streams, nitrogen levels go down through another process. **AMY MARCARELLI** has received a highly prestigious CAREER Award from the National Science Foundation (NSF) to study this nitrogen conversion balance.

She is looking at two biological processes: nitrogen fixation and denitrification. Nitrogen fixation is sort of like a magic show where microbes take nitrogen out of thin air, turning it into a usable form for all organisms. Although nitrogen fixation could offset nitrogen losses from denitrification, we know little about where and when it occurs in streams and rivers and how it responds to human activities.

With funding from the \$794,662, five-year CAREER Award, Marcarelli and her team will help create more accurate nitrogen budgets and models which are needed to better understand and manage the human effects on nitrogen cycling at both regional and global scales. Not only will her research look to affirm—or disprove—long-held beliefs, but also to create a more ecologically savvy citizenry by integrating ecosystem ecology techniques into K-12 and undergraduate education.

Kerfoot Secures Research, Lifetime Achievement Awards



Professor W. Charles Kerfoot's insatiable curiosity and enthusiasm for discovery have propelled him into all corners of his discipline and well beyond the confines of Michigan Technological University. For both the breadth and depth of his contributions to limnology, Kerfoot received the 2013 Research Award and the 2015 IAGLR Lifetime Achievement Award.

Kerfoot came to Michigan Tech in 1989 from the University of Michigan, joining the biological sciences faculty and serving as an adjunct professor of geology. He is also director of the Lake Superior Ecosystem Research Center.

"He has brought tens of millions of dollars in external funding to Michigan Tech, including participation in two of the largest Great Lakes research projects to date," wrote Chandrashekar Joshi, chair of biological sciences, in nominating Kerfoot for the award. In addition, Joshi noted, Kerfoot and the late C. Robert Bailod wrote the proposal that precipitated funding for the \$25 million Great Lakes Research Center.

Kerfoot has always taken the broad view. As an undergraduate at the University of Kansas, he majored in both geology and zoology. After earning a PhD in Zoology from the University of Michigan, he held appointments at the University of Washington, Dartmouth, Cornell, and U-M before coming to Michigan Tech.

"Since coming here, I've done much more than I could have elsewhere," he says. In particular, Michigan Tech's location on the Great Lakes has been an asset. He was a participant in two of the largest freshwater grants ever awarded, totaling more than \$20 million.

Both projects drew researchers in from several universities and government agencies. "I've always tried with my research to go outside the University and connect with other programs," he says. "It makes you more competitive. I always advise my grad students to get out as much as you can."

The lifetime achievement award from IAGLR recognizes important and continued contributions to the field of Great Lakes research for 20 years or more. In a letter notifying Kerfoot of the award, Douglas D. Kane, president of the IAGLR, congratulated him on an "incredibly productive and significant career."



W. Charles Kerfoot's work on *Bythotrephes*—an invasive zooplankton—was featured in a recent issue of *Michigan Tech Magazine*.

Visit, www.mtu.edu/umc/services/pr-news/magazine/spring14/stories/plague, for the full story.

Nancy Auer Earns American Fisheries Society's Award



Professor Nancy Auer has been named winner of the 2015 Michigan Chapter of the American Fisheries Society's Justin Leonard Award. The award recognizes outstanding professional competence and achievement of a professional employed in the field of fisheries or aquatic biology in Michigan. Her nomination for the award included:

Nancy Auer remains an internationally recognized expert in fisheries and aquatic science and has spent her entire professional career in Michigan working to improve our understanding and management of aquatic ecosystems and lake sturgeon in particular. Auer came to Michigan from Minnesota and began her career as a graduate student and research assistant at the University of Michigan in 1975, working under Justin Leonard until his death. Upon completion of her MS degree, Auer continued working at the University of Michigan as a research scholar. In 1984, Auer accepted a faculty position at U-M and began working on the Sturgeon River, which would lead to her dissertation research and PhD in 1995. She has authored or co-authored over 20 journal articles, contributed chapters to four books, and co-edited the book The Great Lake Sturgeon. Auer's impact on the fisheries profession extends beyond Michigan as her students have gone on to professional positions across the Midwest. In summary, Auer's scientific achievements, dedication to quality teaching and mentoring, and service to the fisheries profession are deserving of the Leonard Award.

Chandrashekar Joshi, chair of biological sciences, congratulated Auer on the award. "Her nomination nicely summarizes her lifetime of research work," he said. "We are very happy for this well-deserved recognition by her peers, and we are fortunate to have Nancy as our esteemed colleague."

Bagley Honored with the Charles Porter Award



SUSAN BAGLEY received the Charles Porter Award from the Society of Industrial Microbiology and Biotechnology. This award recognizes member who have an outstanding record of sustained service to the Society for a period of seven or more years in various

capacities—such as a Society officer, chair of a standing or presidential committee, *SIMB News* editor-in-chief, *JIMB* editor-in-chief, *Developments* editor-in-chief, program chair, or other service to the Society acceptable to the committee and board—and have been an active member of SIMB for 10 or more years.

Susan Bagley is professor emerita of environmental microbiology; she has more than 35 years of experience as an environmental microbiologist, working in academia and government—with the US Environmental Protection Agency—on microbial-based treatment of air, waterborne, and industrial organic wastes, microbial production of bio-based fuels, and mutagenicity and toxicity of environmental pollutants.

Jeff Lewin Earns Serving Others Award



JEFF LEWIN has been recognized by Michigan Tech's Staff Council with the Serving Others Award. One of his letters of support called Jeff, “the glue to the department in making sure that research and courses offered go as planned, smoothly

and safely.” Jeff wears many hats: he is the chemical hygiene officer, departmental safety liaison, and equipment coordinator. He oversees two greenhouses, seven instructional facilities, and six common-use equipment facilities. He also assists with fundraising for the department, and is always there to assist students, staff, and faculty with all of their needs. Congratulations, Jeff!

Morin, Durocher, and Hersch-Green Receive Jackson Center Grants

Due to a generous gift from William G. Jackson, the William G. Jackson Center for Teaching and Learning (CTL) is pleased to announce its 2015 grant recipients. Nearly \$55,000 in grants were awarded to instructors and teams of instructors at \$1,000, \$5,000 and \$10,000 levels. These grants will support course/program reform or expansion projects using blended and online learning.

This year's solicitation placed special emphasis on mentoring of instructors new to blended learning, interdisciplinary collaboration, shared content, matching support, testing, and assessment. A committee, assembled by the provost and the CTL director, reviewed many compelling grant proposals in order to select this year's grant recipients.

Grants that included biological sciences faculty are:

- *Blended and Active Learning for Health Sciences at Michigan Tech* (\$5,000) **BRIGITTE MORIN** and **JOHN DUROCHER** (Bio Sci, pictured bottom left and middle)
- *Integrative Statistics for Social, Behavioral and Biological Sciences Using Blended Learning* (\$3,000), Susan Amato-Henderson (CLS) and **ERIKA HERSCH-GREEN** (Bio Sci, pictured bottom right)



Werner Wins Michigan Tech Teaching Award



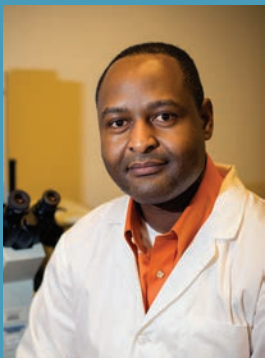
Success is all in the planning. Just ask **THOMAS WERNER**, recipient of Michigan Tech's Distinguished Teaching Award. For Werner, who won the award in the assistant professor/professor of practice/lecturer category, each semester starts an entire year in advance. “People think I'm crazy to start planning my courses so early, but I like to check all of the material to ensure that it's accurate,” he said. “I spend about twelve hours preparing for each fifty-minute lecture.”

Werner came to Michigan Tech in 2010, after serving as a postdoctoral fellow in molecular biology at the University of Wisconsin Madison and completing his PhD at the Umeå Center for Molecular Pathogenesis. He teaches genetics, immunology, and genetic techniques.

His favorite thing about teaching is the energy that comes from working with students. “I've found that in research you can give 100% and only get 10% out,” he said. “With teaching, if you give your students 100%, they'll return the favor.”

New Faculty

Ebenezer Tumban



EBENEZER TUMBAN joined the Department of Biological Sciences as an assistant professor, coming from the University of New Mexico. He received a PhD in Molecular Biology from New Mexico State University and a Master's in Biology from New Mexico Highlands University.

Tumban has been researching virus-like particles to try to increase the immunogenicity of less-immunogenic human papilloma virus (HPV) antigens. He has developed two candidate vaccines for the prevention of HPV.

Faculty Promotions

RUPALI DATTA—2013 from Associate Professor to Associate Professor with Tenure

NANCY AUER—2013 from Associate Professor with Tenure to Professor with Tenure

GUILIANG TANG—2014 from Associate Professor to Associate Professor with Tenure

CASEY HUCKINS—2015 from Associate Professor with Tenure to Professor with Tenure

AMY MARCARELLI—2015 from Assistant Professor to Associate Professor with Tenure

Celebration of 50 Years

The Department of Biological Sciences celebrated 50 years of service in 2012 (blogs.mtu.edu/biological/2012/03/a-history-of-the-department-of-biological-sciences). Here are a few snapshots from the picnic celebration.



Faculty Retirements



Specializing in clinical immunology, among other areas, **ALICE SOLDAN** keeps coming back to the rewards of her teaching career in medical laboratory science. "I enjoyed watching students develop confidence and gather expertise in their profession as they progressed through the university experience," she says.

So far, she says, retirement has been just as exciting as beginning her laboratory career. "I garden and cook from scratch, belong to a small tai chi group, and do quite a bit of local volunteer work," she says. "I also stay in contact with many alumni by Facebook and email (afsold@up.net), and encourage alumni to friend or email me if they want to keep in touch."

She has also worked to establish the Soldan MLS 4+1 Scholarship. "This new scholarship is designed to help MLS 4+1 students make it through their clinical practicum," she says. "The practicum is a special burden for 4+1 students because there is generally no financial assistance available for them. While they've already earned their degree, they're still in training and not earning a salary."

SUSAN BAGLEY, professor emerita of environmental microbiology (pictured on opposite page), retired in 2013. During her career, she specialized in fermentation, metabolomics, and proteomics of bio-based fuels and bio-plastics; microbial bioremediation; mutagenicity and toxicity of environmental pollutants; and control of microbial contaminants in environmental systems.

Since retiring, Bagley has kept active with the American Society for Microbiology and the Society for Industrial Microbiology and Biotechnology. She also spends as much time as possible at the family cabin in northern Minnesota. "I miss interacting with students," she says, "but I still serve on graduate student thesis committees and keep in touch with my colleagues at Michigan Tech. All in all, retirement is great and highly recommended!"



Also retiring was **THOMAS SNYDER**, whose specialty is genetics and molecular evolution. Since earning his PhD from the University of Kansas in 1976, his research has focused on the molecular basis of sex determination and genetic changes that accompany speciation events in biting diptera, and biochemical systematics of closely related taxa.

During his tenure as faculty, Snyder was perhaps best known for his annual trips to the Bahamas, where he brought students to experience a rich array of habitats that would otherwise not be possible. He went on sabbatical in 2004 to learn the techniques of pollen analysis for use in a paleoecological study of the vegetative history of San Salvador in the Bahamas. "The time spent in the field on San Salvador allowed me to visit many sites and habitats I had not had the opportunity to visit previously with students," he explained in his post-sabbatical report.

Great Lakes Research Center: An Investment in State, National, and Global Freshwater Resources



The new Great Lakes Research Center includes aquatic laboratories, a hydraulics lab, coastal research instrumentation, boathouse facilities, offices, and conference rooms, providing a home at Michigan Tech for interdisciplinary research and education related to the Great Lakes. Four biological sciences faculty members have their labs and offices in the GLRC.

Biological Sciences Teaching Labs in the MEEM Upgraded

The department is pleased to announce several significant upgrades to the 11th floor MEEM instructional laboratories. These labs serve most of our first- and second-year courses, our non-majors course, anatomy and physiology, and the medical laboratory sciences curriculum. They also support numerous Summer Youth Program sessions as well as two of our outreach activities: Bioathlon and our high school visit program. The labs were first renovated in 1999, and after 15 years of use, several have received much-needed painting and casework upgrades—especially the sink areas. The most visible improvement was putting vinyl tile down in the teaching portions of the labs. Faculty and graduate teaching assistants have commented on how much brighter and cheerier the labs look and feel.

On the technology side, three labs had significant computer projection upgrades to classroom level systems, and students can now take full advantage of online resources, lecture support, and in-class student presentations.

Of course, a lab runs on its equipment. In addition to facility upgrades, we've replaced outdated equipment in the medical laboratory science lab and added dozens of new microscopes to general biology and anatomy and physiology labs.

Over the next year we plan to continue refreshing paint and replacing old casework. We have one more lab that needs to have its computer projection system upgraded. For the next steps, we'll be evaluating our needs in support of molecular biology, plant biology, and anatomy and physiology. Watch this space next year for additional updates and upgrades.



Calumet High School Places First in 26th Annual Bioathlon

A team of high school students from Calumet High School took top honors in Michigan Tech's annual Bioathlon. A team from West Iron County High School placed second and a team from A.D. Johnston High School in Bessemer was third.

Bioathlon's goal is to stimulate interest in biology and in problem-solving among high school students. Teams from 15 Upper Peninsula high schools participated. Each team consisted of four students who have not taken biology classes beyond the traditional sophomore general biology course.

The teams tackled the same four problems: dissection of a dogfish shark, biochemical effects on enzymes, field identification, and a medical laboratory science challenge.

A workshop on animal migration was offered for the teachers who accompanied the students to the competition. Undergraduate and graduate students and biology faculty participated in designing the problems and supervising the competition.

Funding for Bioathlon was provided by the Michigan Tech Admissions Office, the Department of Biological Sciences, the Michigan Tech Fund, and alumni Mark Cowan, Robert and Kathryn DellAngelo, Olive Kimball, Nancy Auer, and Janice Glime.



Recent Biological Sciences Inductees to the College of Sciences and Arts Academy

Carol A. Kolinsky '74 Inducted in 2014

Carol A. Kolinsky '74 was employed for six years as a medical technologist before returning to school to earn her medical degree from Michigan State University, graduating in 1984. She completed a one-year rotating internship at the William Beaumont Hospital in Royal Oak and two years of family practice in Tiptonville, TN. She returned to William Beaumont Hospital and completed an ophthalmology residency. In June of 1990, Kolinsky opened her private practice in Escanaba and soon after the practice started, she formed U.P. Ophthalmology as a professional corporation in practice with Darrell Kohli.

She is an active member of the American Academy of Ophthalmology, Michigan State Medical Society, Delta County Medical Society, and Michigan Ophthalmologic Society. She has twice been chair of the Department of Surgery at St. Francis Hospital in Escanaba and has also served as chief of staff.

Jeffrey R. Haskins '86 Inducted in 2012

Jeffrey Haskins received dual BS degrees in Biological Sciences and Chemistry from Michigan Tech in 1986. He earned an MS in Toxicology from the University of Michigan in 1988, continuing for a PhD in Environmental Health Sciences in 1998.

Haskins's professional career began in 1988 at the Ford Motor Company in Dearborn as an industrial toxicologist for North American plant operations. In 1989, Haskins joined Parke-Davis Pharmaceutical Research in Ann Arbor—he was involved in the discovery and development of pharmaceuticals such as Lipitor, Lyrica, Nipent, Accupril, and Penetrex.

In 2001, Haskins accepted a position as senior director of assay feasibility for Cellomics, Inc., a small start-up company in Pittsburgh specializing in the development of in-vitro cell-based assays, analytical instrumentation and software. In 2003, Haskins became vice president, technology and product development, and is currently site leader and director of research and development for cellular imaging products for Thermo Fisher.



Carol A. Kolinsky



Jeffrey R. Haskins



MJ Kachmarsky Knapp



Gary L. Fahnenstiel

Mary Janet Kachmarsky Knapp '72 Inducted in 2013

MJ Kachmarsky Knapp graduated from Michigan Tech in three years with BS degrees in Biology and Pre-Med. She furthered her medical education at Georgetown University and Wayne State University, earning her Master's in Physiology and Pharmacology, summa cum laude. Her research in blood coagulation under Walter Seegers included studies of Antithrombin III, Thrombin, and Heparin. MJ graduated from Michigan State University's medical school in 1977. She also conducted independent research in community medicine with a graduate assistantship and was lead project medical school tutor in physiology, microbiology, biochemistry, and molecular biology. During her medical residency, she served as a volunteer physician at the Common Ground Crisis Center, Birmingham, Michigan, a post she held for 14 years.

MJ continues more than 34 years as a clinical professor of medicine at Michigan State and Detroit Medical Center, and has been a physician in private practice for 36 years.

Gary L. Fahnenstiel '80 Inducted in 2012

Gary Fahnenstiel earned his BS in Biology and Chemistry at Eastern Michigan University in 1978, but his vocation started at Tech, where he had the chance to engage in research on Lake Superior as an MS student in biological sciences. He pursued a doctorate at the University of Michigan and worked as a research scientist at the National Oceanic and Atmospheric Administration (NOAA).

Gary has had a long and productive career engaged in the study of the Lakes, having published more than 130 scientific papers. He has served as a member of the steering committee for the Great Lakes Initiative of the National Coastal Ocean Program at NOAA and was associate editor of *The Journal of Great Lakes Research*.

Recently, Gary has been deeply involved in projects related to the impact of nonindigenous species and climate change on the Lakes. He notes that without the valuable experience and education he received at Michigan Tech, his life journey would have been very different and likely less rewarding. He rejoined Tech as a senior scientist in the newly opened Great Lakes Research Center in 2012.

Michigan Tech

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Biological Sciences Announces Scholarship Winners

Karyn Fay, director, medical laboratory science program, and Stacy Cotey, academic advisor, are pleased to announce the following departmental scholarships:

Departmental Scholar

2014–15 Jade Ortiz
2013–14 Lisa Diduch

Jack Holland Endowed Scholarship

Larissa Kramer

Medical Technology Tech Is Award Scholarship

Luke Dalton

Soldan 4+1 Annual Scholarship

Brook Bedore

Kathy Jean Jensen Scholarship

Luke Dalton
Misty Brouillete
Carine Netch-Tokam
Brittany Erickson
Valerie Taglione
Alyssa Vinckier
Kayle Stemberger

Medical Alumni Scholarship

Courtney De Cramer
Rebecca Mills
Abigail Meisel
Mindy Harrington
Ted Ylitalo

More information on these and other departmental scholarships are available on our giving page:

www.mtu.edu/biological/giving

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