MICHIGAN STATE UNIVERSITY

DEPARTMENT OF
GEOLOGICAL SCIENCES

NEWSLETTER FOR ALUMNI AND FRIENDS **SUMMER 2013**

From the Department Chair...

It is my pleasure to introduce this year's issue of the Michigan State University (MSU) Department of Geological Sciences newsletter. Since the last newsletter, we've focused on building a strong foundation for growth after an extended period of budget cuts imposed by a difficult financial period in the state of Michigan.

We've had a number of staff changes, including several new faculty member hirings and two retirements. The two faculty members I mentioned in the February 2012 newsletter, assistant professor Masako Tominaga and associate professor Bruno Basso, are now on campus and rapidly moving their research and education programs forward. This year, the department hired two additional faculty members—Jay Zarnetske and Matt Schrenk—through the newly launched MSU Global Water Initiative, in which the university is investing 16 positions in water-related fields. Jay, who will join us in August, took a hydrological sciences position. Matt, who will join us in January 2014, will be taking a geomicrobiology position. Faculty profiles on both of them are included in this issue on page 4. We are also continuing our search for an exceptional faculty member for the Vogel Endowed Chair in Solid Earth, which was established to honor the retirement and contributions of longtime geology professor Thomas Vogel.

On the other end of the spectrum, Grahame Larson and Bob Anstey have retired after a combined 78 years as professors in the department. We greatly appreciate everything they have done for the department and for all of the students they have educated over the decades.

Participants on an alumni geology trip to the Keweenaw Peninsula last summer make a stop at Esray Park near Eagle Harbor to view lakeshore geology.

The department continues to increase its research profile, effectively doubling its productivity in grant awards and research publications since 2008. We are also in the process of carefully evaluating our courses and degree programs to ensure that our students get the best education possible to ready them for the workforce.

We hope that you will stay in touch, either by stopping by the department offices when you are in the East Lansing area, or by coming to a department reception or event. Our next reception will be held in Denver during the 2013 Geological Society of America Annual Meeting and Expo, Oct. 27-30. Another way to connect with us is through our alumni field trips. We had an excellent trip led by Bill Cambray and Tyrone Rooney to the Keweenaw Peninsula last August; see details on page 3. We will send out an announcement when we plan our 2016 trip. I also plan to reconvene our Alumni Advisory Board this coming year to provide yet another venue for connection between the department and its alumni.

I hope that you find this year's newsletter informative and enjoyable. And thank you, as always, for your continued support of our programs and students. I look forward to hearing from you.

David Hyndman, Ph.D.
Chair,
Department of
Geological Sciences

ALUMNI CLASS NOTES

Jack Everett, geology, '47, retired this year after 67 years of doing mineral exploration in the United States and Canada, as well as most of the countries of Central and South America. He and his wife, Dorothy, split their time between Goodyear, Ariz.; Colorado Springs, Colo.; and Otter Tail Lake, Minn.

William Stelzer, M.S., geology, '67, is doing consulting work on unconventional reservoirs in the Permian Basin and on oil and gas projects in the Michigan Basin. He is also giving informational talks to various groups on hydraulic fracturing on behalf of the Michigan Oil and Gas Producers Education Foundation.

Clair Russell Ossian, M.A.T., geology, '70, is retired after 20 years as a geology full professor. Previous to this career, he spent 20 years in Arco's research laboratory. He lives in the Dallas, Texas, area with his wife, Eleanor. They have two children and two grandchildren.

Joseph Pachut, Ph.D., geology, '77, is an associate professor at Indiana University-Purdue University in Indianapolis, where he continues to study Paleozoic bryozoans and has had three recent publications. He and his wife plan to move back to Lansing after he retires in 2015.

Mark Petrie, geology, '79; M.S., geology, '84, has worked with the Michigan Department of Environmental Quality for 29 years.

Tom Taylor, M.S., geology, '79; Ph.D., geology, '82, retired from Shell a little more than a year ago and now works as a consultant focusing on sedimentary petrology/reservoir quality prediction, mainly associated with Geocosm LLC.

Tim Dellapenna, geology, '86, is an associate professor in marine science and oceanography at Texas A&M University at Galveston. Dellapenna and his wife, Consuelo Waight (who is a professor at the University of Houston) and 3 ½-year-old daughter, Alessandra, live in League City, Texas.

Robert Cunniff, M.S., geology, '89, has been at Hatch Mott MacDonald (New Jersey) and its predecessor companies for about 19 years, working on environmental remediation projects.

Jay Gregg, Ph.D., geology, '82, has been on sabbatical during the 2012-13 academic year, working as a member of the Shell Carbonate Research team in Rijswijk, The Netherlands. Currently living in The Hague, he will return to Oklahoma State in mid-August for the beginning of fall classes.

Robert J. Ellis, geological sciences, '95; M.S., environmental geosciences, '99, was recently promoted to associate vice president at ARCADIS U.S., Inc. Rob and his wife, Caryn Tatterton Ellis (also an MSU alum), are raising three young Spartan fans—Paige (10), Griffin (8) and Graham (3).

Kurt Spearing, M.S., geological sciences, '98, is an assistant professor of anatomy at Morningside College in Sioux City, Iowa. He completed his Ph.D. studying fossil Felids at Northern Illinois University in May 2013.

Lori Babcock, geological sciences, '10, completed an M.S. in geology at the University of Georgia in spring 2012. She is currently working on her Ph.D. in Earth Sciences at Montana State University and recently received a graduate scholarship from Marathon Oil Corporation.

Chelsea Mack, geological sciences, '10, is finishing up her master's degree at Western Washington University. Last June, she received the 2012 Outstanding Teaching Award from the National Association of Geoscience Teachers.

Brett Tomlinson, geological sciences, '10, works at Baker Hughes in Tananger, Norway, and was recently promoted to Field Engineer III.

Help us share your career news, awards, promotions and accomplishments with students and alumni –
http://ns.msu.edu/StayConnected.

In Memoriam

Max Merle Mortland *(1923-2013)*

Max Mortland died on June 29 at the age of 90 in Lansing, Mich. Mortland, professor emeritus, joined the MSU faculty in 1953, where he held the title of professor of soil science and geology for 30 years. He is survived by his wife, Betty, his children and grandchildren.

The Department of Geological Sciences newsletter is published annually by the College of Natural Science for alumni and friends of the department.

Send correspondence to:
MSU College of Natural Science
Advancement Office
288 Farm Lane, Room 5
East Lansing, MI 48824
(517) 432-4561

natsci4you@msu.edu

Contributing writers: Jane L. DePriest, David Hyndman, Val Osowski and Laura Seeley.

Photographs and images courtesy of: Cari Corrigan, Nicole LaDue, Harley Seeley, Remke Van Dam and Elizabeth Wheeler.

Alumni say Keweenaw field trip rocked!

They traveled from Bumbletown Hill to the Quincy Mine, making 15 stops over 2 days. It was a full weekend last August 24-26 as 50 alumni, along with MSU faculty and staff, met in Houghton to explore the Keweenaw Peninsula region, which contains the remnants of the billion-year-old Midcontinent Rift System.

Every four years since 2004, the College of Natural Science Alumni Association, with the Department of Geological Sciences, hosts a field trip for alumni. Past trips included Marquette in 2004 and the Leelanau Peninsula in 2008. The 2012 trip was led by Bill Cambray, professor emeritus of geological sciences, and Tyrone Rooney, assistant professor of geological sciences.

"Many of our students say that, while they were at MSU, field trips were one of the most rewarding parts of their educational experience," Rooney said. "As a result, alumni want to come back to participate in field trips; this allows them to connect with their natural environment, with each other and with the department.

"Our alumni are one of the strongest parts of the department. It's important that we retain a connection with them," he added.

"These field trips are an opportunity for alumni to reconnect with their college friends and revisit places they visited when they were students at MSU," said Cambray, who also helped organize the 2004 trip and wrote the guidebooks for the 2004 and 2012 trips.

Mark Fortuna (geology, '77; M.S., geology, '79) was a first-time field tripper. "I decided to go on the trip because it's a beautiful area, it's a nice time of year to visit and I hoped to see old friends again," he said. "I also wanted to fill a gap in my field camp experience; I was ill during the original visit to the site 37 or 38 years ago."

Fortuna lives in Edmond, Okla., and works for EOG Resources as a geophysical adviser, exploring and developing ideas and locations for horizontal drilling in the Anadarko Basin.

Here's what other alumni had to say about the 2012 trip:

The **Rev. Heather Barta** (education, '95) of Auburn Hills, Mich., had always wanted to go on one of the field trips and finally, in 2012, it worked out so she could go.

A group of geological sciences alumni view the outcrop of Portage Lake Volcanics during the August 2012 field trip to the Keweenaw Peninsula region.

"The highlight of the trip for me was being surrounded by talk of geology again," said Barta. "Life has taken me away from geology, but I still love science. I really appreciated the opportunity to be surrounded by rocks."

She is currently a consultant with The Pampered Chef and is a priest in the Episcopal Church, helping on Sundays in a variety of churches and teaching a preaching class for the Diocese of Eastern Michigan.

Ingrid Jonsson (geology, '67), who lives in Colorado and owns a scientific illustration studio located on the flank of Pike's Peak, said she enjoyed reconnecting with the department to see what's new. "I had not been back to Michigan since graduation and I was attracted to the mining aspect of this trip," Jonsson said.

Peter J. Zirnhelt (geology, '66; J.D., '75) of Traverse City, Mich., now semi-retired after practicing mostly oil and gas law for 38 years, said, "I am always willing to consider a trip to Keweenaw, whether for the geology or the beautiful scenery. When I was in undergraduate school, the copper mines were still operating; we were taken down in one mine and allowed to walk underground to come up in another connecting mine.

"This 2012 trip was organized to give a clear understanding of the relationship of the tectonics to what we were seeing on the ground," Zirnhelt continued. "I have been on several Keweenaw field trips and this is the first time I felt I had a reasonable grasp of not only the big picture but also of the geology of the individual stops."

Stephen E. Tilmann (geology, '72; M.S., geology, '74) of Charlotte, Mich., now retired, attended the 2004 trip and decided to return for the 2012 trip; he and his wife conveniently combined it with a personal side trip to Isle Royale.

"We had never been to the Keweenaw region and figured that the best way to see it would be with a bunch of 'geogapers'!" Tilmann said. "It was also an opportunity to see folks I have known for decades, as well as meet new ones. I have known Bill Cambray for more than 40 years and I enjoy his company."

Cambray said that's one of the main reasons he enjoys being involved in organizing and leading the field trips. "I get a chance to catch up with my former students again."

Tilmann said he's looking forward to the next field trip—in 2016. The department is open to suggestions for future destinations.

The Department of Geological Sciences has added two new faculty members to its ranks for 2013-2014: Matt Schrenk and Jay Zarnetske.

Matt Schrenk likes being on the cutting edge of geobiology, an interdisciplinary field of scientific research that explores the interactions between geological processes and the biosphere. MSU's long history of research in microbial ecology and its emphasis on interdisciplinary collaborations, especially linking the water cycle, geochemistry and microbiology, appealed to Schrenk. He will join the Department of Geological Sciences as an assistant professor in January 2014, and has a joint appointment in the Department of Microbiology and Molecular Genetics.

His specific research examines subsurface microorganisms—how many there are and what they are doing.

"The subsurface environments beneath the continents and the oceans represent the most expansive habitat on Earth, yet we know the least about it," Schrenk said.

He studies the activities of microorganisms in the deep subsurface biosphere using molecular biological approaches coupled with geochemical analyses.

"Investigating these ecosystems will provide insight into the contributions of subsurface microorganisms to global biogeochemical cycles, and may have applications ranging from biotechnology to alternative energy strategies," Schrenk added.

He became interested in this work as an undergraduate at the University of Wisconsin-Madison and pursued a doctoral degree in oceanography at the University of Washington. He currently is an assistant professor at East Carolina University in Greenville, North Carolina.

Schrenk

Schrenk recently was awarded a $1.5 million grant from the Alfred P. Sloan Foundation to lead a research project associated with the Deep Carbon Observatory's Deep Life Directorate. This grant facilitates a range of projects from single cell genomics to high pressure biogeochemistry, and targets critical portals of the deep biosphere in the United States, Canada, Finland and South Africa. Researchers from 10 universities and institutes are coordinating studies to assess how carbon is metabolized and transformed by microbes as it passes from the deep earth into the surface.

He and his wife, Heather Street, and their two young children are excited to come to Michigan and are particularly interested in winter activities and returning to their Midwestern roots.

Jay Zarnetske is interested in fresh water resource issues on a grand scale.

Zarnetske

"I try to better understand the movement of water in the environment and how that affects ecosystems and biogeochemical cycles," said Zarnetske, who will join the faculty as an assistant professor in August. "For example, I look at the coupling between water, solutes, and microbial organisms in rivers and aquifers to determine nitrogen dynamics in our surface waters."

His research is an integral part of the emerging field of hydroecology, which strives to understand the influence of hydrology on ecosystem structure and function.

Zarnetske worked on water contaminant issues as a consultant after completing his undergraduate degree in geology at Colby College in Waterville, Maine. He later pursued graduate studies and received his M.S. in watershed science from Utah State University and his Ph.D. in water resource sciences and ecosystem informatics from Oregon State University. Most recently, he was a Gaylord Donnelley Environmental Postdoctoral Fellow at the Yale Institute for Biospheric Studies. His research has taken him from his roots in the Adirondack region of New York to New England, the Intermountain West, the Arctic, Australia, New Zealand and the Pacific Northwest.

He decided to come to MSU because of the people and the university's newly launched MSU Global Water Initiative.

"I saw MSU investing in what I think are important areas of research and education," Zarnetske said. "In addition, I liked the collegiality and the fact that MSU is a land-grant institution. Its mission to connect science and education with society's needs is exciting to me."

Zarnetske's wife, Phoebe, also will be joining the MSU faculty as an assistant professor in the Department of Forestry.

"Water is a common connection in all of our lives," Zarnetske said. "As the saying goes, we all live downstream. What someone does upstream will ultimately affect you and the ecosystems that society depends upon. My work improves our understanding of that connection."

Studying meteorites may reveal Mars' secrets of life

In an effort to determine if conditions were ever right on Mars to sustain life, a team of scientists, including MSU geological sciences professor Michael Velbel, has examined a meteorite that formed on the red planet more than a billion years ago.

Although this team's work is not specifically solving the mystery, it is laying the groundwork for future researchers to answer this age-old question.

The problem, said Velbel, is that most meteorites that originated on Mars arrived on Earth so long ago that now they have characteristics that tell of their life on Earth, obscuring any clues it might offer about their time on Mars.

"These meteorites contain water-related mineral and chemical signatures that can signify habitable conditions," he said. "The trouble is that, during the time most of these meteorites have been lying around on Earth, they pick up signatures that look just like habitable environments, because they are. Earth, obviously, is habitable. If we could somehow prove that the signature on the meteorite was from before it came to Earth, that would be telling us about Mars."

The meteorite that Velbel and his colleagues examined—known as a nakhlite meteorite—was recovered in 2003 in the Miller Range of Antarctica. About the size of a tennis ball and weighing in at 1½ pounds, the meteorite was one of hundreds recovered from that area.

Velbel said past examinations of meteorites that originated on Mars, as well as satellite and Rover data, prove that water once existed on Mars.

"However," he added, "until a mission successfully returns samples from Mars, mineralogical studies of geochemical processes on the planet will continue to depend heavily on data from meteorites."

A team of researchers, including geological sciences professor Michael Velbel, examined a meteorite from Mars, looking for clues that life may have once existed on the red planet.

Retirements

Professor **Robert L. Anstey** was a member of the department's faculty for more than 42 years. His research focused on the biology and paleobiology of marine Bryozoa, particularly their phylogeny and evolutionary history. He analyzed events such as the initial radiation of the phylum in the Early Ordovician as well as subsequent events such as the Late Ordovician, Mid-Devonian and Late Permian extinctions, using research techniques that included analysis of heritability, selection and microevolution. Students particularly enjoyed his classes in paleobiology, historical geology and the honor's section of History of Life.

Professor **Grahame J. Larson** worked for the department for 36 years. His research interests centered on glacial hydrology and Quaternary geology, including characterizing the sedimentology of glaciogenic deposits that occur along the margin of modern glaciers as well as those left behind by ice sheets that once covered the Great Lakes Basin. Larson worked extensively at the Matanuska Glacier in southern Alaska with a team of collaborators from other universities and the U.S. Army Cold Regions Research Laboratory. He shared his expertise in these subject areas by teaching hydrogeology, glacial geology and global change.

Anstey and Larson are now emeritus faculty members.

Faculty Honors

Associate professor **Julie Libarkin** received the 2012 Teaching Excellence Award from the College of Natural Science (CNS) in recognition of her contributions to teaching. She also received the 2012 Postdoctoral Mentoring Award from CNS for effectively mentoring postdoctoral researchers in both professional development and holistic balance.

Assistant professor **Tyrone Rooney** was selected as a Distinguished Lecturer for the National Science Foundation's GeoPRISMS program for 2013-14. Rooney, whose research focuses on magmatic processes active in continental rift and subduction environments, will lecture on the processes associated with rift initiation and evolution centering on his experience with the East African Rift system.

Assistant professor **Remke Van Dam** is president-elect of the Near-Surface Geophysics Section of the Society of Exploration Geophysicists (SEG). The three-year position runs from 2012 to 2015. He is also on the technical committee for the 2013 SEG annual meeting.

Professor **Michael Velbel** is vice president of the Clay Minerals Society and will become president at the society's 50th annual meeting this fall. Velbel is currently a senior fellow at the Division of Meteorites, Department of Mineral Sciences, National Museum of Natural History, Smithsonian Institution.

Geocognition helps ordinary citizens better understand science

Sheldon Turner and Nicole LaDue are the first Ph.D. graduates from Julie Libarkin's Geocognition Research Lab (GRL), and both now have faculty positions at Northern Illinois University in DeKalb. Turner and LaDue met as graduate students and were married this spring.

"In the GRL, we research how people perceive, understand and reason about Earth processes," said Libarkin, an associate professor of geological sciences at MSU.

As a geology undergraduate at Beloit College, Turner met Libarkin at a meeting of the Geological Society of America. That meeting helped him decide to come to MSU to study geocognition. His doctoral research focused on how visualizing scientific information affects how non-scientists make decisions.

"Not all scientific images are the same in terms of how people use them," Turner explained. "Certain images are better at helping non-scientists make informed decisions."

Julie Libarkin (center), director of the Geocognition Research Lab, is proud of her first two Ph.D. graduates—Nicole LaDue (left) and Sheldon Turner (right). The research of LaDue and Turner may help attract more students to careers in geology.

"For example, if a county were considering fracking, the right visuals could help the public and decision makers make the best choices," he said.

LaDue studied geology at SUNY Albany, completed an M.A. in teaching at Cornell University and taught high school Earth Science. While at the National Science Foundation as an Einstein Distinguished Educator Fellow (2007-2009), she learned about Libarkin's geocognition work, which inspired her to come to MSU. Her doctoral research was on how spatial thinking influences student learning in the geosciences.

"Spatial thinking is the ability to mentally manipulate objects and problem-solve with visual information," explained LaDue, who studied the relationship between spatial thinking and visuals on a high school Earth Science test. "I found that spatial ability is an important factor in performance on questions that have graphs or diagrams, but not as much so on questions that contain only text."

There are not enough qualified people to fill geology-related jobs, according to Libarkin.

"Some of Nicole's work shows ways we might introduce geology to people as a possible career," said Libarkin, who is sad to see Turner and LaDue leave, but excited that they are starting new careers. "The lab will miss Sheldon's unique insights into decision making and Nicole's cognitive perspective."

Connecting the dots: Research helps characterize subsurface properties

Cleaning up contamination in groundwater is hindered by an inability to characterize the main subsurface property that controls flow and transport—hydraulic conductivity. The research of Ph.D. candidate Mine Dogan Diker and collaborators is providing results to solve this problem.

The team developed novel techniques to generate 3-D parameter fields showing the connected nature of subsurface properties better than previously possible. The end result is better predictive models that are used to design effective systems to remediate and manage groundwater resources.

"If you have not characterized the subsurface well enough, you are effectively guessing about how water and pollutants move through it," said David Hyndman, professor and chairperson of the Department of Geological Sciences and an investigator on the project.

The project began in 2008. Remke Van Dam, geological sciences assistant professor and an expert in ground penetrating radar (GPR), is Dogan Diker's adviser and a project investigator.

The team's approach combined a direct-push logging tool with GPR, a geophysics tool that uses high frequency electromagnetic waves to determine geologically different structures.

"Knowing the boundaries of different geological structures and transport properties from the direct-push tool, I filled the gaps using stochastic methods to develop 3-D models," said Dogan Diker. "Now I can create computer simulations of pollutants moving through an aquifer, which makes it possible to design efficient remediation systems."

The research was done at MADE—MAcro Dispersion Experiment—a site at Columbus Air Force Base in Mississippi that is well known for its highly heterogeneous nature and interesting results of tracer experiments, which showed a plume shape completely different from what was expected. Scientists believe that if a method works at MADE, it can be used to solve flow-transport problems at a range of contaminated sites.

For Dogan Diker, not only is the project a dream come true, it's also her ticket to completing her Ph.D., which she hopes to receive by the end of the summer.

"It's exciting to see the end results," Dogan Diker said. "But I also am enthusiastic about it because the project will have so many practical uses."

Breaking down barriers: Putting the w-oman in Oman

Kauthar "Kath" Al-Habsi did something unusual during spring break this year. She worked as a geological field assistant in her home country of Oman.

What's so unusual about that?

"It's culturally unacceptable for Middle Eastern women to do field work," explained Al-Habsi, a geological sciences senior and member of MSU's Honors College. "It's not acceptable to be surrounded by men, especially men you don't know.

"Women are expected to stay in an office and in a job that does not require travel or physical work," she added.

Last summer, when Remke Van Dam, assistant professor of geological sciences at MSU, began looking for students to help with his research project in Oman, Al-Habsi's name came up. Charlotte Cable (Ph.D., anthropology, '12), co-director of an archaeological project working at the UNESCO World Heritage Site of Bat in north-central Oman, recommended Al-Habsi. Cable had met Al-Habsi several years earlier and was "impressed by her self-possession and intellectual curiosity." She suggested to Van Dam that Al-Habsi, as an Omani local, would also be able to help the research team bridge communication and cultural barriers.

When Al-Habsi received an e-mail from Van Dam last July, letting her know she had been selected to join the research team, she said she was surprised.

"I was shocked that I would get the opportunity—as an undergraduate student—to actually do field work," she said.

"In the department it is quite common for undergraduate students to obtain some additional field experience, but it is rare for them to have the opportunity to travel to remote places," Van Dam said. "Another unique aspect of the project is the involvement with archeogeophysics, which is an uncommon area of research for our department."

Kauthar "Kath" Al-Habsi (right) and Remke Van Dam with GPR equipment after finishing their work on the last field day in Oman.

The research team spent 10 days in March at the Bat site, using geophysical tools to perform subsurface testing for archaeological remains.

Of particular interest to the researchers are the ancient houses thought to lie just next to a massive circular stone structure. The stone and mud brick houses are thought to be from around 2500 B.C.

Al-Habsi was assigned to work with a piece of equipment known as GPR (ground penetrating radar), a technology that allows researchers to "see" underground without drilling, probing or digging—which could damage the archaeological remains. Other team members were responsible for operation of the magnetometer, an instrument commonly used for these types of investigations.

"Preliminary review of the data we collected indicates that there is something there, so that's very exciting! After processing the data, we will know more," Al-Habsi said.

"Kath proved to be an amazing asset to the project on a number of levels," Cable said. "She worked diligently to learn how to use the equipment and understand GPR data in archaeological contexts. She managed the research, as well as her interactions with locals, with marked grace and professionalism. I was particularly struck by her ability to organize and manage the local young men (an unruly population in any culture!) who conducted fieldwork with us."

Al-Habsi has been invited back to help with the next phase of the Oman project. She said she may return to Oman after she graduates this December, prior to starting graduate school in California or Texas in September 2014.

"I really want to change this idea in my country that women can't do physical work," Al-Habsi said. "They are smart, they want to learn to do this type of work and they have the passion to do it. But the barriers put up by their parents and their culture keep them from doing it."

Her plan is to put together an all-female team to avoid the issue of working alongside men. To address the issue of physical work, Al-Habsi said they could work limited hours (early in the morning or late afternoons to avoid the hottest part of the day) to allow the women to fulfill their other obligations, enabling them to balance their home and work lives.

"This is something that I really wish to do in the future," Al-Habsi said.

MICHIGAN STATE UNIVERSITY | DEPARTMENT OF **GEOLOGICAL SCIENCES**

c/o College of Natural Science
288 Farm Lane, Room 103
East Lansing, MI 48824-1115

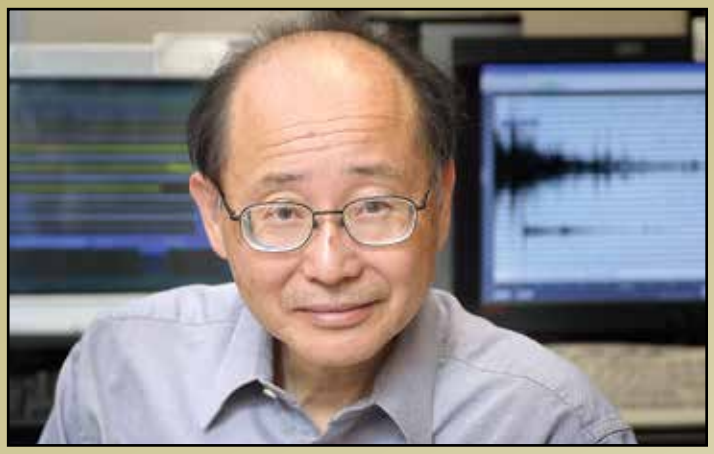
MSU helps shake up Earth Science education in Michigan

Watching seismic activity from an earthquake in Russia being recorded in your own classroom—as it's happening—can be intriguing. Just ask the students or teachers in the 17 K-14 schools that are now part of MIQuakes, a regional educational seismographic network developed in 2010 by the Michigan Earth Science Teachers Association (MESTA).

When the Incorporated Research Institutions for Seismology (IRIS) started the Seismographs in Schools (SIS) program more than a decade ago, workshops were presented at various schools and a number of teachers applied to get seismometers in their classrooms, including several in Michigan. As interest grew, these teachers saw the need for more coordination so they established MIQuakes, which is co-sponsored by IRIS and MESTA, with support from MSU and Michigan Technological University.

Kazuya Fujita, MSU professor of geological sciences, has been involved with MESTA for 15 years and serves as the coordinator for MIQuakes activities in Michigan's lower peninsula. Several teachers involved with MIQuakes are Department of Geological Sciences alumni.

"I want to help promote Earth Science education, ensuring that it's sustained in the state and that teachers have access to the resources they need," Fujita said.



Shown on the screens behind Kazuya Fujita, professor of geological sciences, is the recording of a magnitude 8.3 earthquake in Russia's Far East on May 24, 2013. The recording system shown here is identical to the one used by the MIQuakes network.

Fujita hopes the program will continue to grow. In addition, software being developed by IRIS will enable teachers—even if they do not have their own instruments—to bring the dynamic Earth into their classrooms. The software will allow schools "to record any seismic station that supplies digital data to IRIS in real time from anywhere on the planet."

The reason MIQuakes has been successful, according to Fujita, is because the group is statewide, and it's supported by a statewide organization.

"It's a model we hope to develop elsewhere in the country," he said.