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Associate Professor Shiyue Fang and his graduate student received the Bhakta Rath Research Award.

Greetings from New Department Chair Cary Chabalowski



My first academic year at Michigan Tech as the chair of Chemistry came to a close with the Spring 2014 semester. Thus far, I have immensely enjoyed the challenges of the job and the wonderful interactions with the faculty, staff, and students, and I have been impressed with the remarkable talent that exists at Tech. In addition, my wife, Molly, and I have also enjoyed the natural beauty of the Keweenaw that coexists with the man-made amenities provided by both the University and the area's legacy of mining.

I would like to take this opportunity to introduce myself to you. My area of science is theoretical chemistry, and more specifically, quantum chemistry; I have twenty-nine years of experience researching in this area. My career began as a research chemist in drug design at a pharmaceutical company, followed by eighteen years as a research chemist working at the Army Research Laboratory (ARL). From ARL, I went to DC in 2003 to help develop and support research plans and budgets primarily for the Army. This work was quite exciting and provided me opportunities to work with many talented people across the Department of Defense and other parts of the federal government.

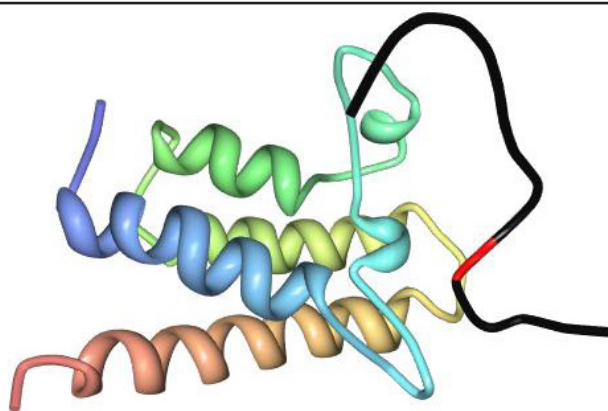
In the summer of 2012, my wife and I retired from our jobs in the capitol area. (Molly is a retired elementary school music teacher.) We sold our home in Alexandria, Virginia, and moved to our retirement home on Mercer Lake, in northern Wisconsin. Unfortunately, after about seven months, Molly told me that I had "flunked retirement." I am not exactly sure what that means, but she strongly supported me in returning to my work.

Prior to my "retirement," I had the desire to get back into research after nearly ten years as a manager. As life so often goes, one thing led to another, and I am now thrilled to be at this outstanding university.

I encourage you to plan a trip to Tech and stop by my office for some coffee or tea—I would love the opportunity to tell you more about the wonderful things going on in Chemistry. And while you are here, meet some current students, as well as the terrific staff and faculty that help make the department such an outstanding asset to the educational mission of Michigan Tech. Our department is also working on sending alumni more-frequent updates on the many accomplishments and happenings in Chemistry. This newsletter is only one of the many ways we hope to keep you informed.

We are also interested in how you are doing, so please take a few minutes to visit our website and share something about yourself and/or your family: www.mtu.edu/chemistry/department/alumni/share.

On behalf of the entire Department of Chemistry, I wish you and your family a healthy and happy fall!



The human polybromo protein contains six bromodomains, which bind to acetylated lysine residues. Here, the second bromodomain is seen binding to an acetylated lysine residue located on a segment of histone protein H3. The recognition of acetylated lysine residues on histone proteins by human polybromo protein has been found to play a major role in gene expression.

Lab: Associate Professor Martin Thompson; Research Scientist Momoko Tajiri; Graduate Students: Sarah Hopson, Katrina Bugielski, and Chelsea Nikula

Primary focus: Human polybromo histone/nucleosomes post-translational modification

2014–15 Departmental Goals

The chemistry department's high-priority goals focus on establishing or increasing funding for graduate and undergraduate research, infrastructure improvements, and student recruitment.

Student Development

Our students, both graduate and undergraduate, perform an active role in the research productivity of our department. They travel to present at conferences, compete (and win!) in research symposia, and publish their research (sometimes as first authors). Activities such as these—increasingly essential components of both a graduate and an undergraduate education—set a Michigan Tech degree apart from the competition.

Specific ways to assist our students include

- graduate student summer research fellowships (approximately \$4,000 per student for a summer);
- graduate student research assistantships (approximately \$40,000 per student for a year);
- undergraduate student summer research fellowships (approximately \$3,000 per student for a summer);
- student travel support to present research at science conferences (approximately \$1,000 per student); and
- postdoctoral research fellowships (approximately \$55,000 per Fellow for a year).

Infrastructure Enhancement

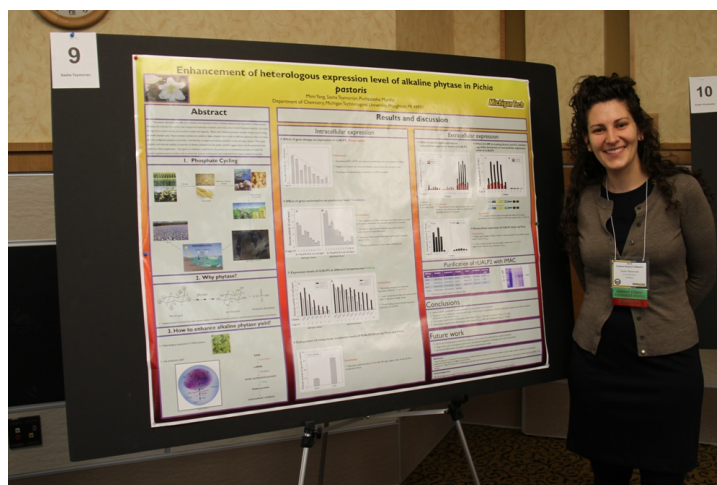
Upgrading undergraduate teaching labs is critical to providing a world-class education. The Chemistry Learning Center has recently expanded to meet the growing demand for services and is still under construction. We are seeking input from department

researchers regarding the equipment needed for groundbreaking discoveries. In pursuit of these goals, we invite you to consider being a part of

- modernizing undergraduate teaching labs;
- completing the Chemistry Learning Center expansion; and
- providing cutting-edge research equipment.

Enhance Our Student Recruitment

Please help us maintain the high quality of students in chemistry at Michigan Tech by telling your friends and relatives about the outstanding educational opportunities available through the Department of Chemistry.



Chemistry graduate student Sasha Teymorian won third place for her poster on "Enhancement of Heterologous Expression Level of Alkaline Phytase in *Pichia Pastoris*" at the 2014 Graduate Research Colloquium.

New Faculty

Andrew Galerneau, Lecturer



Andrew Galerneau earned his MS in Biological Chemistry from the University of Michigan and joined Michigan Tech in 2007 as our organic chemistry lab supervisor.

In 2010, he accepted the position of instructor for the organic chemistry lecture sections. Last fall, he was promoted to the faculty position of lecturer. Andrew has a strong interest in teaching and has participated in workshops for green chemistry experiments, guided inquiry labs, and Process Oriented Guided Inquiry Learning (POGIL). His current interests lie in developing active- and blending-learning curricula for both organic lab and lectures.

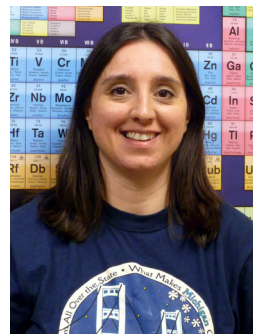
Marina Tanasova, Assistant Professor



Marina Tanasova joined our organic faculty in fall 2013, coming to Michigan Tech from a postdoctoral position at the Swiss Federal Institute of Technology

(Zurich). Marina holds a PhD in Organic Chemistry from Michigan State University. Her research interests include the synthesis of molecular probes for evaluating substrate selection by carbohydrate transporters, the development of platforms for tumor imaging and drug delivery, the evaluation of mechanisms of damage selection by DNA repair pathways, and the design and synthesis of bioreductively activated DNA repair inhibitors. Marina is excited to be at Michigan Tech and looks forward to establishing her research group.

Loredana Valenzano, Assistant Professor



Loredana Valenzano joined our physical chemistry division in fall 2012. Loredana completed her MS in theoretical particle physics through a joint project between the

University of Torino (Italy) and the Stanford University. She earned her PhD at the University of Southampton (UK) and held postdoctoral positions at the University of Leiden (Netherlands) and the University of Torino prior to joining Michigan Tech's Department of Physics as an assistant research scientist. Loredana's research interests focus on theoretical and computational chemistry, electronic structure theory applied to molecules and materials, molecular adsorption on surfaces and in cavities, solvent effects on properties of molecules, and solids, with an emphasis on hydrated versus vacuum conditions.

Former Chemical Engineering Chair Edward Fisher Passes Away



Edward Fisher, whose visionary leadership helped lay the foundation for the modern Department of Chemical Engineering, passed away Saturday, Aug. 2.

Fisher came to the University in 1985 as head of what was then the Department of Chemistry and Chemical Engineering. When a separate Department of Chemistry was formed in the College of Sciences and Arts, he continued as chair of chemical

engineering. In 1995, Fisher served as interim dean of engineering and then, after a final year as chair, returned to the faculty in 1997. He retired in 2003.

"Ed hired me, and he hired about half our department," said Associate Professor Tony Rogers. "He left a big imprint. He had a very clear vision of where he wanted the department to go. We wouldn't have our Unit Operations Lab in its current form without him, and he initiated the PhD program."

Although Fisher did not conceive the department's

showpiece Unit Operations Laboratory, he spearheaded the drive to get it funded. The facility has stood the test of time.

"Twenty years later and it's still state of the art," said Professor Emeritus Bruce Barna. "People are still amazed when they see it. I don't know that there's anything like it elsewhere, and without Ed, it wouldn't have happened."

"He also hired and recruited many of us and helped draw up our master plan," Barna added. "We were lucky to have him come up here. He made his mark."

Fisher earned a BS in Chemical Engineering from the University of California, Berkeley and a PhD in Chemical Engineering Science from Johns Hopkins University. He worked in industry and then joined the faculty of Wayne State University in 1968.

He was named 1982 Chemical Engineer of the Year by the Detroit Section of the American Institute of Chemical Engineers, and in 2006 he was inducted into the chemical engineering department's Distinguished Academy, in part for his exceptional efforts on behalf of the department.

Rogers remembers Fisher as the penultimate department chair. "Ed was always confident and had a serenity about him that was contagious," he said. "I never heard him raise his voice, and that's quite an accomplishment for a chair. He was very sharp and highly respected."

Dallas Bates Retires



Professor Emeritus Dallas Bates retired last fall after thirty-eight years at Michigan Tech. His association with the University goes back to his undergraduate studies in the late '60s.

During his time as a student, Dallas particularly enjoyed the Copper Country's four seasons of outdoor recreation. Tech's campus

had a different look in those days, before the ME-EM, EERC, Dow, SDC, or Rozsa Center had been built. The current Chemical Sciences and Engineering Building opened in Dallas's second year.

In 1971, he graduated with a bachelor's degree in Chemistry and went on to receive a doctorate from the University of Idaho.

Following a postdoctoral appointment at the University of Zurich in Switzerland, Dallas joined Michigan Tech's chemistry faculty in 1975. Throughout his career, he taught courses in organic chemistry; carried out research, including developing methods for heterocycle synthesis and creating novel applications for sulfoxides; and served the department and University

in myriad other ways, before deciding the time was right to retire.

What does Dallas miss most? "I miss chatting about the philosophy of chemistry, teaching, or research with my colleagues," he says.

His fondest memories involve the numerous graduate and undergraduate students he mentored and taught over the years.

In retirement, Dallas reports that he is happy, which is evident when he drops by the chemistry office for a visit, and keeping busy. "I have a lot of hobbies, and I'm working on a lot of projects that I had been hoping to get to. I hope to travel but haven't been able to do much of that yet, as my wife is still working."

We wish you the best in your retirement, Dallas!

Professor Emeritus David G. Leddy Passes Away



David Leddy passed away April 28 at the Houghton County Medical Care Facility, where he had been a resident for four months. He was 75.

Leddy was born in 1938 in Saginaw. He earned a BS in Chemistry from Michigan Tech and a PhD in Chemistry from the University of Kansas.

He joined the chemistry faculty in 1965 and retired in

2002. "We had coffee together every day for 37 years," said his colleague and friend Professor Emeritus Larry Julien. "Dave was a nice guy, always there for the students. He was the primary analytical teacher in our department."

With fellow faculty member Jim Spain, Leddy conducted research on Lake Superior and Portage Lake. "He was one of the first doing chemical analysis on the Keweenaw Waterway," and often consulted with environmental engineering researchers. For faculty investigating water quality, "Dave was the go-to guy," Julien said.

In addition, Leddy served as the primary safety

officer on campus. "He did a great service to us," said Professor Pushpa Murthy. "He also taught safety to the students. It was a loss when he retired."

Occasionally, Murthy would join Julien, Leddy, and Professor Emeritus Fred Williams for coffee. "He had all these great stories about fishing and canoeing," she said.

Leddy enjoyed fishing for perch and walleye and for a time was an avid deer hunter. "When he was a student in the early 1960s, they used to hunt deer down by Tapiola," said Julien, who often joined Leddy fishing in Dollar Bay. Back then, clear-cuts had drawn in unprecedented numbers of deer. "By Misery Bay, they were like herds of cows," Julien said.

"He was always delightful and cheerful," Murthy said. "I never saw him angry, irritated, or upset with students. As a colleague, he was always good-natured. Dave was just a wonderful person."

Leddy made major contributions to the field of environmental science, with an emphasis on the health of our lakes and rivers. Over the course of his career, he published over twenty-five research papers and scholarly reports, was awarded numerous research grants, and received many invitations to speak on his work.

Dean Seppala



Dean Seppala has served on the Michigan Tech staff since 1988, when he joined the chemistry department as a student employee.

After graduating with an associate degree in electrical engineering in 1990, he moved to a

full-time position. Dean currently serves as a research associate—a role that requires him to wear many hats. He is the technician for all research/teaching equipment and instrumentation and handles responsibilities ranging from plumbing, maintenance, and electrical work to laboratory and office upgrades. In this capacity, he works closely with Michigan Tech's facilities trades staff and engineers on projects within the Chemical Sciences Building.

During his student years, Dean worked as a tradesman in the Copper Country, performing residential electrical, carpentry, painting, and other jobs. He brings this invaluable expertise and broad knowledge of trades to the department.

He is known as someone who can offer up ideas and advice on just about anything; in response to this, Dean laughs and adds, "as long as it is not directly related to the field of chemistry."

Dean, who is a Lake Linden native, enjoys spending time outdoors with family and friends and golfing, fishing, and hunting.

He is a loyal fan of the Lake Linden-Hubbell school's sports teams, the Detroit Tigers, and the Green Bay Packers. Showcasing his devotion to the Packers during one Winter Carnival, Dean created a nine-foot-tall logo snow statue in his yard that garnered attention by both the local media and major news outlets in the region.

Thinking toward the future, Dean says he hopes to become a snowbird when he retires someday, living in the Copper Country from June to December and wintering someplace warmer; however, for now, he is content and embraces the Keweenaw's white winters.

"What I enjoy the most about working at Michigan Tech is all of the great friendships that I have made and will continue to make with faculty, staff, and students throughout the campus," Dean says. "Since 1988, I have seen a lot of people come and go, but I will never forget their laughs and smiles."

Student Awards

Spring Awards Program 2014

Students were recognized for their academic achievements and service to the department at the department's annual awards banquet last spring.

Spring 2014 awardees included—

Freshman Chemistry Achievement Award:

Andrew Hubbell

Doc Berry Award: Jayna Winegarden Feinauer

Leslie Leifer Award in Physical Chemistry:

Andrew Perla

Outstanding Senior Award: Kathryn Weinand

Outstanding Senior Research Award: Daniel Beegle

Biochemistry Research Award: Nikolai Pieniazek

Undergraduate Award in Inorganic Chemistry:

Daniel Beegle

Undergraduate Award in Organic Chemistry:

Nathanael Green

Outstanding Lower-Division Chemistry Teaching

Assistants: Sarah Hopson and Douglas Smith

Outstanding Upper-Division Chemistry Teaching

Assistant: Mu Yang

Outstanding Graduate Student: Durga Pokharel

Ray E. Cross and Eleanor K. Cross Endowed Graduate Fellowship in Chemistry: Melanie Talaga

Rebecca Sandretto-Susan Stackhouse Summer

Fellowship: Anna-Catherina Wilhelm

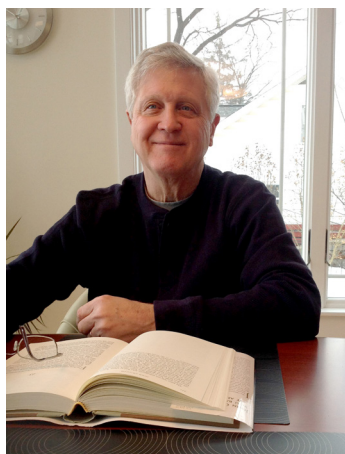
Departmental Scholar: Aaron Chartier

Woman of Promise: Eponine Zenker

Department of Chemistry Ambassador Awards:

Alexandra Maday, Rachel Fouts, Thomas Schneider, Nikolai Pieniazek, Melanie Talaga, and Chelsea Nikula

Graduate Research Fellowship Named After Bob and Kathy Lane



Graduate students in the Department of Chemistry have an exciting new funding opportunity on the horizon. Beginning in 2014–15, a graduate research fellowship will support exceptional graduate students who are nearing the end of their doctoral studies. Established in honor of Bob '72 and Kathy Lane through a \$100,000 gift, the fellowship will initially be awarded as a competitive

Finishing Fellowship to one chemistry graduate student each year and will eventually be converted into a fully funded, multiyear graduate research fellowship as the endowment grows.

"The department is exceedingly grateful to the Lanes for making this fellowship possible," says Department Chair Cary Chabalowski. "Such support is a crucial part of the department's plan for growing and enhancing the graduate research program."

Bob Lane received a Bachelor of Science in Chemistry from Michigan Tech and went on to earn a PhD in Inorganic Chemistry from MIT in 1976. From there, he built an outstanding career in the chemical industry.

Following a postdoctoral position at IBM's Central Research Lab in San Jose, he joined The Shepherd Chemical Company as a research chemist in 1977. He assumed a leadership role with The Shepherd Color Company in 1988, eventually rising to the rank of president and CEO. Bob jointly served as the president

of The Shepherd Chemical Company and The Shepherd Color Company from 2007 to 2011, when he then returned exclusively to the former company until his retirement in 2013.

"I was very fortunate to work for and with the Shepherd family for all those years—they are wonderful people," he says.

Thinking back to his college days, Bob says the students were always the focus at Tech. "The class sizes, especially the advanced chemistry classes, were small and allowed you to have a lot of contact with the professors."

Bob's first chemistry professor, Doc Berry, left a lasting impression. "He was an interesting character—both an entertainer and instructor.

"I can still recall something he said in class after all these years. In response to a student who asked if we would have class the following day—I don't remember the circumstances—he responded, 'Why is it that people seem to want less than their money's worth when it comes to getting an education?' In essence, why wouldn't you want to have class, since you're paying for it? I took that message to heart and tried to get everything I could out of every class I took."

Bob credits his success to an invaluable Tech education—and to his wife, Kathy, who raised their two sons "mostly by herself" because Bob's job required quite a bit of travel. Kathy worked in the Mechanical Engineering-Engineering Mechanics Department at Tech while Bob took classes. She finished her degree in education at Miami University after they moved to the Cincinnati area and taught at the elementary level for many years. They currently live on Portage Lake near Pinckney, Michigan, and are renovating an old cottage.

Alumni Updates

1966

Manfred Philipp is ending six years on the Fulbright Association Board of Directors in December, having served as secretary to the Board and chair of the Governance Committee. He has been elected president of the German Academic Exchange Service Alumni Association for the United States for the next three years. In the last decade, he was twice a Fulbright Senior Scholar, first at the Catholic University of Portugal and later at the Patan Academy of Health Sciences in Nepal.

1984

Aimee Modic (Larchar) has served as the high school mentor for the US National Chemistry Olympiad during the past three summers. She says, "This experience has allowed me to work with the top high school chemistry students in the nation. In 2012, at the International Chemistry Olympiad in Washington, DC, the kids took one gold and three silver medals. In the summer of 2013, the students brought home two gold and two silver medals. It has been awesome."

We always look forward to hearing from our alumni. You can share your story at www.mtu.edu/chemistry/department/alumni/share/.

Fang, Pokharel Win the Rath Research Award



Shiyue Fang (right) and Durga Pokharel were honored for their research on purifying synthetic peptides and DNA sequences.

Another faculty-graduate student duo in the chemistry department has garnered the Bhakta Rath Research Award. Associate Professor Shiyue Fang and PhD candidate Durga Pokharel received this prestigious award for 2014 for their groundbreaking system to purify synthetic peptides and DNA.

Endowed by 1958 alumnus Bhakta Rath and his wife, Shushama Rath, the award recognizes a doctoral student and advisor for “exceptional research of particular value

that anticipates the future needs of the nation while supporting advances in emerging technology.” Last year, Associate Professor Lanrong Bi and her PhD student, Nazmiye Yapici, were named the award recipients for their work in employing novel fluorescent dyes to detect sick mitochondria.

Pokharel and Fang developed a quicker, simpler way to purify synthetic peptides and DNA sequences. Peptides have the potential to fight some of the most intractable diseases, and DNA is a critical element of gene therapy.

Fang credits Pokharel’s thoughtful diligence for much of the projects’ success.

“Durga is truly vested in the work, and anytime there is a problem, even a minor one, he lets me know right away and explains the fine yet important details accurately, so we can discuss it and try different solutions,” Fang said.

Pokharel also has an exceptional work ethic. “He is always focused, always reliable, and always in the lab,” said Fang. “And he’s very efficient. These projects wouldn’t have been accomplished to this level without him.”

Pokharel’s accomplishments are even more noteworthy because his efforts were unfunded. He is supported as a graduate teaching assistant, not a research assistant, and thus juggled instructional responsibilities with time in the lab.

2013–2014 Support Awards for Research

National Science Foundation Funding

Associate Professor **Zhanping You** (Civil and Environmental Engineering) and Co-PI Professor **Patricia Heiden** have been awarded a three-year, \$200,000 research grant from the National Science Foundation for “SusChEM/Collaborative Research: Fundamental Understanding of Foaming Process Towards a New Warm Mix Asphalt Technology.”

Michigan Tech Research Excellence Fund (REF) Award

Four faculty in the Department of Chemistry received REF awards for 2015:

- **Infrastructure Enhancement Grants**

Associate Professor **Lanrong Bi**
Assistant Professor **Marina Tanasova**
Department Chair **Gary Chabalowski**

- **Technology Commercialization Grants**

Associate Professor **Shiyue Fang**

- **Research Seed Grants**

Assistant Professor **Ashutosh Tiwari**
Assistant Professor **Lynn Mazzoleni**

Superior Innovations

Associate Professor **Lanrong Bi** has been awarded a \$15,000 grant to pursue commercialization of her “Novel Fluorescent Probes for Lysosomal Labeling.”

US Department of Health and Human Services

Associate Professor **Shiyue Fang** has been awarded a three-year, \$333,631 research grant from the US Department of Health and Human Services, National Institutes of Health for “Oligodeoxynucleotide Synthesis Using Protecting Groups and a Linker Cleavable Under Neutral Oxidative Conditions.”

2014 ACS Upper Peninsula Student Research Symposium

Last spring, the Upper Peninsula Local Section of the American Chemical Society hosted a research symposium at Northern Michigan University for undergraduate and graduate students. Over \$400 in awards were distributed to the best posters at the event.

Chemistry undergraduate student **Daniel Beegle** tied for the second-place poster award for the Undergraduate Division, and chemistry graduate students **Suntara Fueangfung**, **Ashok Khanal**, and **Melanie Talaga** tied for first place in the Graduate Division.

Giving

Periodic Table of the Elements																	
H	Li	Be		B													
He	Na	Mg		Al													
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I
	Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At
	Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt								
*Lanthanide Series				Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu
**Actinide Series				Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr

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CHROMIUM
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Other Giving Opportunities

All gifts to the chemistry department are used to enhance the education of our students. We have a giving webpage—www.mtu.edu/chemistry/departments/giving—to make sure your gift goes to the right place. Donations of any amount are welcome, and listed below are a few of the areas to which you can direct a gift. You may also use the enclosed envelope to make a gift.

Chemistry Learning Center

The CLC is an important part of our department. Funding helps to provide quality coaching in a comfortable, supportive learning environment. This service continues to have a substantial impact on student success and retention.

Undergraduate research

Support undergraduate student research and the development of valuable professional skills.

Graduate research

Support graduate student research, travel, and professional development activities.

Elements of Success

Our Elements of Success Periodic Table honors donors who give \$1,000 or more to the chemistry department. As a donor, you are invited to select an element from the Periodic Table and have your name, or the name of someone you wish to honor, permanently associated with that element and the department. You will also receive your own personal tile as a memento of your generosity to our department. Our goal is for each of the 118 elements on the Periodic Table to have a sponsor.

The Elements of Success Periodic Table is housed in the hallway on the first floor of the Chemical Sciences Building, outside Room 101, and you can see the lists of sponsored and available elements on our website: www.mtu.edu/chemistry/departments/giving/elements. For more information, please contact us.