We’re Number 1 (and 2, and 3)
Math Majors Have the Best Jobs

If you are reading this, there’s a good chance you were a math major, and these findings may be no surprise. But when Careercast.com developed its list of the Top Ten Jobs You Can Get Today earlier this year, the news was unusual enough to warrant a feature in The Wall Street Journal January 9, “Doing the Math to Find the Good Jobs.”

“Mathematician” made CareerCast’s number one slot as best job of all, followed closely by “actuary” in second place and “statistician” in third.

Jobs were evaluated according to work environment, stress, income, physical demands, and hours worked per week. The findings are based in part on data from the US Bureau of Labor Statistics and the Census Bureau.

Typically, employees in the best jobs enjoy safe, comfortable working conditions (unlike roofers, for instance, who were listed among the ten worst jobs), make a good living, work reasonable hours, and have good job security and prospects for promotion.

The three worst jobs, in descending order, were lumberjack, dairy farmer, and taxi driver.

“In my experience, many students enjoy mathematics and statistics, but have little idea of careers outside of teaching,” said Mark Gockenbach, chair of the Department of Mathematical Sciences. “I think CareerCast’s ranking of the top jobs shows that there are many rewarding math-related careers.”

To read more about the best and worst jobs, visit www.careercast.com/jobs/jobsRated.

Dear Friends of the Department of Mathematical Sciences,

I hope this newsletter finds you all well and prospering in these challenging times. The department continues to move forward in our core activities of teaching and research, as seen by the following facts:

• Enrollment in Mathematical Sciences courses now exceeds the total enrollment at the University.
• Thanks to the generosity of Dick and Liz Henes, the department has its first endowed professorship (see back cover).
• Companies are visiting campus specifically to recruit our students, especially those concentrating in actuarial science.
• Departmental faculty continue to publish their research at an impressive rate.

If you would like to support Mathematical Sciences, here are a couple of ideas:

• When you give to Michigan Tech, you can designate your gift for Mathematical Sciences. Such gifts are used to enhance the experience of our students by bringing speakers to campus to talk about careers in mathematics, sending students to conferences to expose them to the larger world of mathematics, making awards to outstanding students, etc. You can give online at https://www.banweb.mtu.edu/mtu/mtf/gift/give.xsql

• If you work for a company that hires mathematicians or statisticians, consider establishing a recruiting relationship with the department. Every year we graduate outstanding students with bachelor’s, master’s, and PhD degrees. Please contact me if you would like to pursue this.

I hope you enjoy this issue of The Third R, particularly the profiles. Four of your fellow alumni have shared their stories with us. You can also meet three new members of the math faculty and learn more about two professors who came to the University over fifteen years ago.

Thanks for your continued interest in the department.

Best wishes,

Mark Gockenbach, Chair
Jianping Dong arrived at Michigan Tech in 1992, having grown up in Beijing and eventually earning a PhD from New York University. She is now a professor of mathematical sciences and directs the department’s graduate program.

Dong was drawn to Tech for many of the same reasons as other faculty, students, and staff. “I enjoy outdoor sports and small-town living,” she says. “All of the people I met during my interview were very nice, and I thought they would make good colleagues. It is a better place than I imagined before I came here.”

Her interest in statistics arose from an interest in math. “I like mathematics, especially applying it to real-world problems,” she says. “Statistics allows me to do exactly that.”

She focuses her research on statistical genetics, working to develop statistical methods to better understand complex human diseases.

Dong says she also enjoys the other aspect of faculty life: teaching. “I love to teach,” she says. “I’m a very talkative person and always eager to explain things to people. So teaching is very enjoyable for me. You always feel young and energetic when you are with the students.”

When asked about her future, Dong says she is happy with what she is doing right now. “I’d like to keep doing my research, teaching, and traveling,” she says.

When not in the classroom or working through statistical genetics problems, you will likely find Dong outdoors. “I like gardening,” she says, “and in the winter I enjoy cross country and downhill skiing.”

Even with her research and its potential impact on people’s health and well-being, and with her love of teaching, Dong says she measures success in a much simpler way. “How do I define success? Have a happy family.”

Yolanda Muñoz Maldonado came to Michigan Tech in 2008, having earned a PhD in Statistics from Texas A&M, which, she says, is her most significant accomplishment so far. “I am the first member of my family to reach a PhD,” says Muñoz. “My dad always told me that whatever I want to achieve I can achieve. I only have to put my mind and heart in it. I believe him.”

She also holds a master’s in statistics from the University of Texas at El Paso, and a BS in Mathematical Education from the Universidad Autonoma de Yucatan in Merida, Mexico.

Muñoz says her first love is functional data analysis. “This type of research extends standard statistical theory to groups or collections of continuous functions,” she explains. One practical application involves data related to aerosol absorption and dispersion in the atmosphere, a research project on which she collaborates with Claudio Mazzoleni of Tech’s physics department.

In addition, she says, “I am working on a test that will detect differences between several groups of curves, similar to traditional ANOVA. I work, too, in new techniques for calculating sample size for experimental designs.”

Of her decision to come to Michigan Tech, Muñoz says, “I liked the department and thought that it was the right environment for me. Tech has exceeded my expectations.”

Her mentor since her arrival has been Professor Tom Drummer, known for his application of statistics to wildlife management. She says simply, “He is great.”

When not teaching, working on her research projects, or consulting (is there any time left?), she says she enjoys tennis, reading, and walking.

Vladimir Tonchev came to Michigan Tech as an associate professor in 1991. He was, he said, “thrilled by the prospect of living in one of the best 100 small towns in America, and Tech has most definitely met my expectations.” He became a full professor in 1993 and has become a force in the field of combinatorics.

“My research interests are in the area of discrete mathematics, coding theory and combinatorial designs, more specifically,” he said. “My goal is to search for the best combinatorial designs and optimal codes used in digital and quantum communications.”

Tonchev said his choice of math as a career goes back to his teenage years. “As a high school student, I figured out that it took me less time to prepare for math,” he related. “Actually, it was taking me even less time to get ready for my music classes, but I felt that music might be too competitive for me.”

From high school, he stayed in his hometown and attended the University of Sofia, in Bulgaria, and received a degree in math in 1975. He stayed for graduate school, earning an MS and PhD, both in mathematics and computer science. He then spent four years as a research and visiting fellow at various locations, moving to the US in 1991.

While he has taught students for almost two decades, he says that “the joy of teaching is increasing with the years.” After all, he says, “students will be the creators of tomorrow’s better future.”

In addition to his prodigious professional output, he says music continues to be near and dear to his heart, and he cites guitar playing and singing as among his favorite pastimes. He also says the Keweenaw has provided him with the most odd thing he has ever done. “I jumped in Lake Superior in mid-June once;” he shivered.
FACULTY Profiles

Wenjun Ying

He has earned an award for student leadership, one for excellence in teaching, and, in his first year at Michigan Tech, a departmental award for research. Now he has earned a three-year grant from the National Science Foundation worth almost $190,000.

“My current research interests focus on numerical methods for modeling cardiac electrical dynamics,” says Wenjun Ying, an assistant professor of applied and computational mathematics. “Modeling the electrical activity of the heart can help us understand the underlying mechanisms for heart disease, which is the number one cause of death in the United States. However, the simulation of cardiac dynamics is still extremely expensive. My main objective is to significantly improve the efficiency and accuracy of the modeling algorithm.”

Ying came to Michigan Tech from Duke University, where he earned a PhD in Mathematics in 2005 and served as a research associate in biomedical engineering and an instructor of mathematics. He also holds master’s and bachelor’s degrees in mathematics from Tsinghua University in China.

It was at Duke that he received an award for excellence in teaching.

“In my opinion, the first and most important philosophy in successful teaching is to show your enthusiasm in teaching to your students,” he said. “I hope with teaching I can inspire students to learn and apply, engage students in the classroom, and share my love of mathematics.”

When offered the opportunity to join the Michigan Tech faculty, he did not hesitate. “It is a well-known research university,” he explained. “The town is one of the best ten places to live in the States, which is a very attractive reason for my family to choose to come here.”

So far, he says, it has been a good choice. “This is a very friendly and effective department,” he explained. “As a junior faculty member, I appreciate very much the help and kindness I get from the senior faculty members for my research, education, and even everyday life.”

He says his hobby—cooking Chinese food—relates to his academic career. “Research and cooking are very similar,” he says. “I love to learn cooking from available recipes, but I never simply accept any recipes. I always think direct experience is more important. Direct experience helps us know how to fine-tune a recipe to make delicious food. Foods made by different people often have totally different tastes, even if they follow the same recipe.”

Le (Adam) Zhang

Le (Adam) Zhang is involved in some pretty heady stuff: using his computational expertise to simulate brain cancer and skin cancer. But when you ask him about his greatest accomplishment thus far, he answers simply, “my family.”

Now starting his second year at Michigan Tech, Zhang applies his interests in computational analysis and modeling—and using his experience in biomedical imaging—to problems associated with cancer. Recent research projects include using regression analysis and multivariate analysis to simulate brain cancer progression. He has also simulated bio-heat transfer in an analysis of using hyperthermia in skin cancer treatment.

“My research involves bioinformatics, and I hope to make useful contributions to biology research,” he says, adding that the “large range of research” associated with computational mathematics attracted him to the field.

He gained significant research experience as a postdoctoral fellow at the Harvard–MIT Health Sciences and Technology program’s Center for Biomedical Imaging. He holds a PhD in Computational Mathematics and master’s degrees in computer science and mathematics from Louisiana Tech, as well as a bachelor’s in computer science from the Peking Institute of Technology.

His experience also includes a stint as a software engineer for Bell Labs in Chicago and at Lucent in China.

At Michigan Tech, Zhang also teaches multivariable calculus and, in his spare time, enjoys soccer and playing the piano. Besides the academics and an opportunity to pursue his research, he cites another reason he came to Michigan Tech: “I like sports and snow.”

Department Climbs—Again—in National Research Funding Rankings

The Department of Mathematical Sciences has climbed in the National Science Foundation’s ranking of research expenditures.

According to NSF figures for fiscal year 2007, released in March, the department is now seventy-fifth in the nation, with more than $1.7 million in research. The department surged into the top 100 in fiscal year 2006, with a ranking of seventy-ninth.

Michigan Tech’s overall science and engineering research expenditures increased more than 28 percent during fiscal year 2007, which places it sixty-sixth in the nation among universities without medical schools. The University ranked 117th among public universities and 163rd of 662 institutions nationally.

Michigan Tech’s NSF research expenditure rankings increased in almost every science and engineering discipline. “These figures are extremely encouraging,” said David Reed, vice president for research. “They reflect real progress toward our goal of becoming a premier technological research university.”

Michigan Tech’s overall research expenditures have more than doubled, from $27.2 million in 2000 to $55.3 million in 2007.
Mandy Frantti

Mandy Frantti has traveled the country and won national awards for teaching, but she keeps coming back to Munising, Michigan.

“I have completed sixteen years of teaching in the same classroom overlooking Munising Bay and the Pictured Rocks National Lakeshore,” says the 1993 Tech graduate. “I’ve taught various mathematics classes, physics, applied physics, astronomy, and integrated science.”

While maintaining a full teaching schedule, she serves as head of the science department at Munising High and has created professional development programs for elementary school teachers. She also has been active nationally, including working as a NASA astrophysics educator ambassador. “I have been traveling the country doing workshops and presentations for educators and students sharing exciting new discoveries and developments in space as well as here on Earth,” she says. She has also received the Presidential Award for Excellence in Science Education.

The Laurium, Michigan, native knew she wanted to teach from the get-go. “I knew I definitely wanted to teach physics,” she says. “In physics, the applications and fun are obvious. In math, some teachers obscure the applications and fun by falling into a rut and presenting ideas as algorithms. I wanted to be one of the teachers who make math interesting.”

After earning a BS in Mathematics and a minor in physics, plus an education certification, from Tech, she did graduate work at Tech and Northern Michigan University.

“I had an absolutely fantastic education from Michigan Tech,” she says. She is particularly pleased with Tech’s approach to teacher education, requiring students to earn a degree in the field in which they will teach—not just an education degree. “I have worked with many teachers and found that one of the major weaknesses is not having a strong background in the subject area,” she says. “This is not true of Tech graduates. My degree allows me to approach teaching from a deeper level, even though it doesn’t mean that I’m teaching calculus to eighth graders. I also appreciate that Tech’s course requirements make for a well-rounded person and better problem solver.”

Frantti takes well-roundedness to heart. “I love music, and I give piano lessons in the evenings,” she says. “I am an artist, doing watercolor and portrait drawing. I take joy in photography, sitting by Lake Superior, writing, reading, giving gifts, and travel. My sister and I have traveled to Europe, China, Thailand, Malaysia, Singapore, and many places on this continent. These are some of the things that are near and dear to me.”

After a decade—and-a-half in the classroom, Frantti says she still comes back to the reason she went into teaching in the first place—working with young people. “Every year I have students who make it clear that I have influenced their lives for the better. The awards I’ve gotten as a result of a student nominating me as their ‘most influential educator’ have meant more than any award I’ve received from anywhere else. I absolutely love teaching, and I love my students.”

Rui (Sammi) Tang

“I love number crunching,” says Rui (Sammi) Tang. But not just any numbers. Tang is interested in statistical genetics, the subject of the dissertation she completed while earning a PhD in Mathematical Sciences. “Statistics helps me understand the world from a data analytics point of view,” she says. “Michigan Tech has a great statistical genetics program and provides a great place to live.”

Tang has embarked on a career at Amgen, a top biotech company headquartered in California, where she plans to “be a major contributor in the development of drugs for cancer patients.” Five years from now, she hopes “to be a senior, experienced biostatistician in the biotech industry and develop novel methods for analyzing patient health data and designing efficient drug studies.”

Tang’s research involved developing more efficient methods for investigating the relationship between human genes and diseases like diabetes. She studied with Shuanglin Zhang, who holds the Richard and Elizabeth Henes Professorship in Mathematical Sciences.

Originally from Chengdu, in China’s Sichuan Province, Tang says her family and friends have been important as she pursued her career. “My family was always supportive as I grew up,” she says. “When I was at Michigan Tech, I met lots of friends and great colleagues who I enjoyed being with and learned a great deal from.”

She also found an outlet in sports while at Tech. “Basketball, badminton, hiking, and actually all kinds of sports games are interesting to me,” she relates. That love of games and number crunching came in handy during her graduate school years, as well. “I won first place in the Michigan Tech poker tournament among about sixty students in 2008,” she says. “It was my first poker tournament ever.”

Xuexia (Helen) Wang

Xuexia (Helen) Wang is one of a growing number of PhD graduates from the Department of Mathematical Sciences, having found her way to Houghton from Heze, China.

“I was interested in the work being done by Professor Shuanglin Zhang, who is an excellent scholar,” she said. “I was also attracted to the reputation of Michigan Tech and its location in a beautiful part of the country.”

Wang earned two PhDs—one from China in econometrics and one from Michigan Tech focusing on statistics. “I have always been confident in mathematics and like the area of statistics specifically,” she said. “I learned a great deal about my discipline through the training I received and the research I conducted.”

For her dissertation, Wang investigated ways to develop new statistical methods for detecting the susceptibility locus—a point in the gene that is susceptible to mutation—of the human genome for a disease. She wants to use this experience, and her education, “to serve on the faculty of a university where I can continue my work in statistical genetics and develop useful methods in searching for disease-related loci, and also to be a good teacher for my students.” She is now a postdoctoral researcher in the biomedical division of the University of Pennsylvania Medical Center.

Wang describes herself as an optimistic person. She carries that optimism into the classroom and research lab, and also when comparing her home country with her adopted land. “I believe that the economy of US and China will be better and offer fruitful opportunities for both countries to collaborate on projects designed to improve the conditions of people worldwide,” she said.

When not in the classroom or lab, she enjoys swimming and playing table tennis. She also reflected on one of the new icons of American culture. “I once tried to sell a piano on craigslist. That website is full of shysters!”
**ALUMNI Profiles**

**Rob Swiatek**

Rob Swiatek took a roundabout path to a degree (in math, with a concentration in actuarial science) from Michigan Tech. He then took a roundabout path in his career, going from a company with more than 200 actuaries to a company with just two.

“Initially, I sought out Michigan Tech because I wanted to be an engineer, and I had heard of the quality of the engineering programs,” he says. “Also, there was never a shortage of people out there who had a high opinion of Michigan Tech graduates.”

From engineering, he migrated to finance and economics and seemed on a solid career path.

“I was close to finishing up my finance degree when I seriously began researching what kinds of jobs finance alumni usually take on,” he recalls. “I began to realize that I was disinterested in the typical jobs that finance majors held. I eventually stumbled upon actuarial science and learned about actuaries and their role in the insurance marketplace. Ultimately, I chose to study math to better prepare me for this field.”

After graduating in 2005, Swiatek joined Liberty Mutual in Wausau, Wisconsin, studying loss occurrence patterns for workers’ compensation and commercial auto policies. This work fed into the company’s planning and cash flow models. Two years later, he moved to the company’s headquarters in Boston, working as a claims actuary.

A year later, in 2008, he moved from bustling Boston to quiet Presque Isle, in far northeastern Maine, and from an actuarial group of 200 to two.

“I followed my wife when she accepted a job as a district conservationist for the USDA-NRCS [the Department of Agriculture’s National Resource Conservation Service].”

Being an actuary in a small firm gives me the opportunity to wear many hats. Primarily, I share responsibility with the other company actuary in determining personal and commercial line insurance rates and reserves.”

Swiatek says his Michigan Tech education has served him well.

“I recall maintaining a constant balance between being gainfully employed, keeping up with group projects, completing homework assignments, and making sure my fiancée didn’t run off with one of those hip STC [scientific and technical communication] majors,” he says. “Honestly, entering the ‘real world’ was sort of a joke by comparison. In the real world, you’re allowed to stop thinking about work after 5 p.m. and on the weekends.

“I also remember that we had snow every once in awhile.”

**Research in Brief**

Professor Juergen Bierbrauer, with colleagues from Europe, has given a geometric description of quantum codes in terms of systems of lines in binary projective spaces. He used this description to determine the complete spectrum of binary quantum codes of distance 3.

Professors Jiaping Dong and Renfang Jiang developed a wavelet-based estimator of multinomial probabilities and proved that its mean-square error achieves the optimal rate of convergence. In related work with PhD student Yilin Dai, they proposed a wavelet-based score test that identified certain genetic loci associated with rheumatoid arthritis.

Professor Tom Drummer, working with the Michigan DNR, developed a censusing method for sharp-tailed grouse. These birds, while not considered a threatened species, are declining in number.

Professor Donald Kreher and Assistant Professor Melissa Keranen, with William Kocay and Pak-Ching Li from Canada, found an algorithmic solution to the question of existence of a 3-uniform hypergraph with a given degree sequence.

Assistant Professor Phil Merkey, with students in mathematical sciences and computer science, parallelized the Pettie and Sanders approximate matching algorithm and a maximal clique finding algorithm. They used the PGAS parallel programming model, enhanced with atomic memory operations.

Assistant Professor Yolanda Muñoz Maldonado developed a method for estimating sample size for an experiment with a combination of discrete and continuous correlated random variables. Current techniques calculate sample sizes for experiments with only discrete or only continuous variables.

Professor Iosif Pinelis, with PhD students Elena Kasyanova and Raymond Molzon, obtained limit theorems and inequalities for a large class of statistics, including non-central Student’s and non-central Hotelling’s statistics, as well as Pearson’s, Kendall’s, and Spearman’s correlation statistics.

Assistant Professor Qiuying Sha, with PhD student Adan Niu and Research Scientist Zhaogong Zhang, developed a two-stage method for identifying combinations of genes that affect complex diseases. The proposed method is applicable to genome-wide association studies.

Professor Allan Struthers, with the Center for Experimental Computation, has set up a graphical programming unit (GPU) computing cluster using NVIDIA CUDA hardware and compilers. A CUDA programming seminar is helping graduate students and faculty from across campus exploit this computational resource.

Professor Vladimir Tonchev, with PhD student David Clark and Dieter Jungnickel from Germany, found an infinite series of counter-examples to the thirty-six-year-old Hamada’s conjecture about characterization of finite affine geometry designs in terms of the rank of their incidence matrices.

Assistant Professor Wenjun Ying, with colleagues from Duke University, developed an efficient algorithm for modeling the electrical activity of the heart by incorporating adaptivity in both space and time.

Assistant Professor Fabrizio Zanello gave a solution to a long-standing conjecture of Richard Stanley predicting an asymptotically sharp lower bound on the degree 2 entry of a Gorenstein Hilbert function. This was listed by Stanley among “some problems I couldn’t solve” at the 2004 sixtieth-birthday conference given in his honor.

Assistant Professor Le Zhang, with colleagues from Harvard and Michigan Tech, created several multi-scale, multi-solution agent-based models to simulate the progression of brain and ovarian cancer cells.

Professor Shuanglin Zhang, with PhD student Rui Tang, postdoc Tao Peng, and Assistant Professor Qiuying Sha, created a new approach for genetic association analysis based on a variable-sized sliding-window and principal component analysis.
Tech Mathematicians Find Genes Linked to Lou Gehrig’s Disease

Researchers in the Department of Mathematical Sciences have linked three genes to the most common type of amyotrophic lateral sclerosis (ALS), generally known as Lou Gehrig’s disease.

Shuanglin Zhang, who holds the Richard and Elizabeth Henes Professorship in Mathematical Sciences, leads the team of mathematicians that isolated the genes from the many thousands scattered throughout human DNA. He notes that their discovery does not mean an end to ALS, but it could provide scientists with valuable clues as they search for a cure.

It can’t come any too soon. Zhang started showing symptoms of the disease himself four years ago. He now breathes with support from a respirator and works at home with the aid of a research assistant and his wife, Qiuying Sha, an assistant professor and member of his research team.

“I felt very urgent to find the genes for ALS,” he said.

“This is very nice work,” said Xiaofeng Zhu, an associate professor of epidemiology at Case Western Reserve University’s School of Medicine. “It’s very challenging to map genes for complex diseases, and while many statistical methods have been developed, most don’t work well in practice. Zhang’s group has developed a method to detect genes and gene-gene interaction in complex diseases and provided evidence that it works.

“Their findings will need to be confirmed by other researchers, but I think this will be very useful for the investigators who are trying to find genes underlying complex diseases such as ALS,” said Zhu.

According to the ALS Association, only about 10 percent of patients have familial ALS, a directly inherited form of the usually fatal neuromuscular disorder. The remaining 90 percent, including Zhang, are diagnosed with the sporadic form of the disease. While scientists have long suspected that genetics plays a role in sporadic ALS, they have had no evidence to back it up, at least until now.

Everyone has the three genes in question. But in people with sporadic ALS, they differ from those in people who don’t have ALS.

The mathematicians were not surprised when they tracked down the genes’ street address. “Everybody has 23 chromosomes, and the three genes on chromosomes 2, 4, and 10 interact,” explained Sha. “If you have this combination of the three genes, you are at high risk of developing the disease.”

“It’s really exciting, especially because my husband has sporadic ALS,” she adds. “Maybe they can find a cure by blocking the genes.”

According to the ALS Association, approximately 30,000 Americans have ALS, and about 5,600 new cases are diagnosed every year. The disease destroys the nerves in the brain and spinal cord that control voluntary movement, eventually leading to paralysis.

Zhang’s team used a new statistical method to analyze the genetic codes of 547 individuals, 276 with sporadic ALS and 271 without. Their method, a two-locus interaction analysis approach, allows the researchers to identify multiple genes associated with a complex illness.

The data set they analyzed was provided by the National Institute of Neurological Disorders and Stroke (NINDS) Human Genetics Resource Center at the Coriell Institute (http://ccr.coriell.org/ninds), a publicly funded “bank” or repository for human cells, DNA samples, clinical data, and other information that aims to accelerate research on the genetics of nervous system disorders.

“Ideally, we should confirm our results in a second data set, but we don’t have one available,” Sha says.

ALS is not the first condition they have tackled. Using data sets provided by the University of Cambridge, Zhang, Sha and their colleagues have also identified 11 genes linked to type 2 diabetes, which has reached epidemic proportions in the US.

The team hopes to apply their methods to other medical conditions but has been hampered by the lack of genetic information: most data sets are not freely available to researchers. Zhang found out about the ALS data sets serendipitously, while searching the ALS Association website for information on his condition.

“Unfortunately, we don’t have access to more data sets,” said Sha. “If we did, we could analyze even more diseases.”

Their work is being funded by a grant from the National Institute of General Medical Sciences, part of the National Institutes of Health. A paper detailing their work, “Genome-wide Association Reveals Three SNPs Associated with Sporadic Amyotrophic Lateral Sclerosis through a Two-locus Analysis,” is published in the open access journal BMC Medical Genetics. In addition to Zhang and Sha, the other coauthors are Zhaogong Zhang from Michigan Tech and Jennifer Schymick and Bryan Traynor of the National Institutes of Health.
Department at a Glance

Graduates

University-wide enrollment in math courses

Recent Grants

Tom Drummer, co-principal investigator
“Responsible Conduct of Research in Science and Engineering Education”
$19,364 (three years), National Science Foundation

Josif Pinelis, principal investigator
“Exact Inequalities and Limit Theorems for Rademacher and Self-normalized Sums, and Related Statistics”
$150,000 (three years), National Science Foundation

Don Kreher, principal investigator
Missy Keranen, co-principal investigator
“IMA Participating Institutions Conference Proposal—Combinatorial Configurations and their Applications”
$2,500 (one year), Institute of Mathematics and Its Applications (IMA) at the University of Minnesota

Departmental Award Winners for 2008–09

Faculty

Outstanding Research (Assistant Professor): Wenjun Ying and Adam Zhang
(Associate or Full Professor): Juergen Bierbrauer and Josif Pinelis

Outstanding Teaching (Lecturer or Assistant Professor): Phil Kendall and Hillary VanSpronsen
(associate or Full Professor): Allan Struthers

Graduate Students

Outstanding Teaching: David Clark and Kira Durand

Outstanding Research: David Clark, Yilin Dai, and Elena Kasyanova

Undergraduate Students

Norman E. Scholz Award: Melissa Socks

Norman Scholz received his bachelor’s degree in mathematics in 1958 and later earned a master’s degree from the University of Michigan. Upon his untimely death on October 13, 1977, his parents established an award in his memory. The Norman E. Scholz Award is given each year to the most outstanding senior in mathematics. This year’s winner was Melissa Socks.

Melissa graduated summa cum laude in May 2009 with a concentration in actuarial science. She had a perfect 4.0 cumulative GPA (which, according to one of her professors, is an underestimate of her actual performance). As a coach in the Math Learning Center, she tutored her fellow students, and she is now employed in the insurance industry doing actuarial work.

Charles Knobloch Award: Jeff Zylinski

Charles Knobloch graduated from Michigan Tech with a BS in Geological Sciences and established an award to encourage the use of higher mathematics in industry and to encourage future alumni contributions. This award is given for outstanding performance in upper-level math courses, especially Abstract Algebra and Real Analysis.

The winner of the Charles Knobloch Award for 2008–09 is Jeff Zylinski.

Jeff graduated in May with a major in mathematics and a minor in French. He took a long list of advanced undergraduate math courses, as well as two graduate courses. In addition, he did a research project with Fabrizio Zanello that resulted in a paper, which recently appeared in the Journal of Pure and Applied Algebra.

Jeff is now pursuing a PhD at Purdue University.

Mathematics Achievement Awards

The Mathematics Achievement Award was established by the faculty of the department to recognize students who have demonstrated high levels of achievement and/or creativity in mathematics courses, projects, or activities.

This year three students were recognized:

- **Ryan Dood**—Ryan just finished his third year at Michigan Tech. He is concentrating in actuarial mathematics and has a 3.87 cumulative GPA, with a perfect 4.0 GPA in his math courses.

- **Mike Misson**—Mike graduated in May with a double major in computer engineering and mathematics. He joined the graduate program in mathematical sciences at Michigan Tech in fall 2009. He had a cumulative GPA of 3.74, with a GPA of 3.95 in his math courses.

- **Jie Zeng**—Jie joined the department in spring 2008 as a transfer student, concentrating in statistics with a minor in economics. Jie has a 3.96 cumulative GPA, with a perfect 4.0 GPA in her math courses.
Michigan Tech

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Richard, Elizabeth Henes Endow Math Professorship

Michigan Tech alumnus Richard Henes and his wife, Elizabeth, have donated $1 million to endow the Richard and Elizabeth Henes Professorship in Mathematical Sciences.

The new professorship has been awarded to statistical geneticist Shuanglin Zhang. He won Michigan Tech's 2008 Research Award for research into the genes associated with inherited diseases such as type 2 diabetes and amyotrophic lateral sclerosis.

The Heneses previously endowed a chair in mechanical engineering. Their long-standing support of the University has earned them membership in the Hotchkiss and Hubbell Societies for lifetime giving and the McNair Society for their estate gift commitments.

"With this latest generous gift, Dick and Liz Henes have challenged Michigan Tech to continue building a stellar mathematical sciences faculty and to tackle significant problems facing humankind through exceptional research and teaching," said Michigan Tech President Glenn D. Mroz.

A native of Menominee, Michigan, Henes earned a BS in Mechanical Engineering from Michigan Tech in 1948, followed by a law degree from the University of Michigan. After moving to Arizona, he founded Henes Manufacturing Company, Henes Products, and Henes Stamping. He also became a successful real estate investor in Phoenix.

Henes has retired from all but real estate investing. He and his wife divide their time between Paradise Valley and Flagstaff, Arizona.

Henes credits Michigan Tech with stimulating his interest in mechanical engineering and his determination to excel at whatever he did. For many years, Henes has had an active interest in mathematics, and he regards it as the essential building block of all scientific and technological disciplines.

"Liz and I have decided to invest our resources in what will help the world, and Michigan Tech is our choice," said Henes. "What we are doing through this gift is small compared to what Michigan Tech can do for the world."

The Henes professorship is the first named faculty position in the College of Sciences and Arts.

"Endowed faculty positions are a pivotal feature of research universities, for they enhance the productivity of faculty, allowing exciting and promising projects to get started, then move forward and reach completion more quickly," said Bruce Seely, dean of sciences and arts. "I could not be more thrilled that the Heneses have chosen to present the first such endowed professorship in the College of Sciences and Arts to Mathematical Sciences, which has been conducting increasingly recognized research in a number of areas, including statistical genetics."

"It is an honor to be the first Henes Professor," said Zhang. "I would like to thank Mr. Henes for his contribution. I will use the funding to support graduate students and postdocs. Mr. Henes's contribution will certainly strengthen my research and will help the development of the department as well."

Mark Gockenbach, chair of mathematical sciences, added, "It is gratifying that such a successful engineer and businessman would recognize how central the mathematical sciences are to Michigan Tech. This is also a well-deserved honor for Shuanglin, who has done so much for the department and continues to work at a very high level in spite of the physical challenges he faces [Zhang has ALS; see page 6]. And the Henes Professorship will help the department to continue to build a highly productive and innovative faculty."