Billstein Lands Funding for National Math Education

by Cary Shimek, University Relations

University of Montana Professor Rick Billstein has a dream: that every U.S. middle school student receive a math education that is clear and understandable, uses real-world examples and is (dare we say it) exciting.

To that end, Billstein has landed about $4.7 million in new funding to update and disseminate the innovative math curriculum designed by him and his UM colleagues with input from many of the nation's best math teachers. The four years of fresh funding comes from the National Science Foundation, Billstein's book publisher and other sources.

Billstein said, ?When they are learning math in the classroom, kids say, 'Are we ever going to use this stuff?' Our system puts math into context and it teaches them using something they are familiar with.?

Billstein's system is called MATH Thematics, which is designed to be an exciting, effective way to teach math to middle school students. With U.S. students consistently lagging behind their international counterparts in math test scores, Billstein landed a $3.5 million, five-year grant in the early 1990s to develop a better way to teach kids the subject.

Originally titled STEM (Sixth Through Eighth Mathematics), MATH Thematics was field tested with 35,000 students around the country and written with contributions from top math educators. Billstein and lead writer Jim Williamson, a UM math adjunct assistant professor, spearheaded the group that distilled all
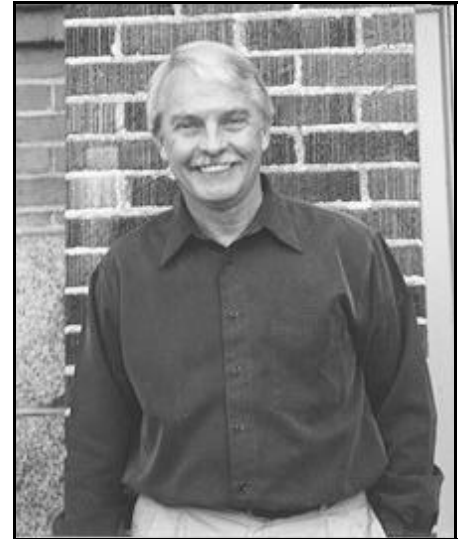
Rick Billstein

this information into a new curriculum, which was published by McDougal Littell in 1998. MATH Thematics is now used locally in Missoula, in all 50 states and by U.S. Department of Defense schools worldwide.

?The impact UM has had teaching mathematics nationally and

Big Question

**by Betsy Cohen
of the Missoulian, 9/5/2002**

Editors' Note: Dr. Jeff Weeks was the keynote speaker at the Big Sky Conference on Discrete Mathematics & a President's Lecture Series Speaker last September. This article appeared in the Missoulian before his talks.

The infinite wonders of the universe may have one less mystery in the coming months.

While we go about our daily business, doing the laundry, paying bills and watering the summer flowers that have managed to hang on, a NASA satellite is floating through space and gathering data about the heavens above.

Jeff Weeks

Soon that information will be available to a handful of astrophysicists who have the math skills and the courage to attempt to answer this question: "Is the universe infinite?"

Among the brilliant minds working on the project is mathematician Jeffrey Weeks, who is the keynote speaker at the University of Montana President's Lecture Series on Thursday.

"When we look out on a clear night, the universe seems infinite," said Weeks, who arrived in Missoula via Canton, N.Y., on Wednesday. "Yet this infinity might be an illusion."

He punctuated his point by taking a humble piece of notebook paper and curving the sheet upward until both ends of it touched. "This could be all there is," he said. "It could be that space wraps up in itself.

"The idea is really very simple, but it's such a mental exercise to get it it's

Notes from the Chair's Desk

The University of Montana saw record enrollments this fall. So, as you might expect, we have record enrollments in mathematics as well. There are 54 people teaching for the department and almost 3500 students enrolled in mathematics courses. Classes at all levels are filled more than ever before. We welcomed two new faculty members, two lecturers, four visiting professors, and eight new teaching assistants.

Once again, the Big Sky Conference on Discrete Mathematics kicked off the school year when featured speaker Jeffrey Weeks gave the first Presidential Lecture. His talk on the geometry of space drew a standing-room only crowd. Our faculty members continue to provide a large outreach program. The National Science Foundation sponsors three research grants in the department. Johnny Lott is now full time in his role as President of the National Council of Teachers of Mathematics.

Bill Derrick and Mary Jean Brod have announced their retirements. Both of them will be teaching their last semester this spring. That will mean we have some big shoes to fill. Bill has been a faculty member here for 30 years, serving two terms as department chair. Mary Jean has been the stabilizing force in our developmental program for 25 years. We thank them for their service and wish them a well-deserved rest before they take up their full-time retirement duties.

The budget difficulties of the past few years are not going away. Most states are facing serious shortages, and Montana is no exception. As we struggle to keep the standards high for the campus community, I again want to express my thanks to our many contributors who help us provide the best quality in mathematics instruction. As always, I invite you to drop us a line. We certainly enjoy hearing from graduates and past colleagues about your activities.

James Hirstein

Faculty:
Jim Hirstein, *Chair*
Mark Kayll, *Associate Chair*

Rick Billstein, *Mathematics Education*
Mary Jean Brod, *Developmental Mathematics*
Bill Derrick, *Applied Mathematics*
Rudy Gideon, *Statistics*
Jon Graham, *Statistics*
Jim Hirstein, *Mathematics Education*
Leonid Kalachev, *Applied Mathematics*
Mark Kayll, *Combinatorics*
Libby Krussel, *Mathematics Education*
Johnny Lott, *Mathematics Education*
Jenny McNulty, *Combinatorics*
George McRae, *Optimization*
Adam Nyman, *Algebra*
David Patterson, *Statistics*
Greg St. George, *Analysis*
Regina Souza, *Lecturer*
Bharath Sriraman, *Mathematics Education*
Brian Steele, *Statistics*
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Nikolaus Vonessen, *Algebra*

Emeritus Faculty:
William Ballard
Stanley Grossman
Gloria Hewitt
Don Loftsgaarden
Merle Manis
Robert McKelvey
William Myers
Howard Reinhardt
George Votruba
Keith Yale

Emma Lommasson visits during Chuck Funkhouser's colloquium on December 18, 2001. Pictured with Mary Jean Brod & George McRae

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at the address above or e-mail
lazure@selway.umt.edu.

The 2002 Big Sky Conference on Discrete Mathematics

by Mark Kayll and Jenny McNulty

The Big Sky Conference on Discrete Mathematics was held at the University of Montana from 5–7 September 2002. Participants, including students and faculty from across North America, traveled to Missoula to present their results and collaborate on new research. In addition, the Missoula community was involved through activities for students and an evening public lecture for everyone. On each of these facets, the conference was well-attended, well-received, and highly successful.

Three lectures were given by the two invited speakers, Jeffrey Weeks and Penny Haxell. Dr. Weeks is a MacArthur Fellow and freelance mathematician who lives in Canton, NY, while Dr. Haxell is a University of Waterloo professor, presently on leave at Lucent Technologies. One highlight of these lectures was Weeks' University of Montana President's Lecture on "The Shape of Space". Some estimates put the audience over 500, and the standing-room-only crowd was not disappointed. Weeks began by exploring several 2D-surfaces through computer games. This laid the foundation for a deeper exploration of 3-dimensional space, which helped the speaker convey the possible shapes of a finite universe. In addition, both Weeks and Haxell gave colloquia on their research to the conference participants and local scientific community.

The contributed talks were divided into four sessions spread over the three days of the conference. There were fourteen talks in all, on topics including combinatorial number theory, graph theory, probabilistic methods, discrete geometry, and applications. Presenters ranged from undergraduates who recently completed REU's (Research Experiences for Undergraduates), to students from nearby colleges, to faculty from universities in Canada and the United States.

Thursday's activities were designed to encourage student participation. In addition to the student conference attendees, students from Gonzaga University, Carroll College, the University of Montana and several local high schools attended the days' events. The morning opened with a session for contributed talks by undergraduates, while Weeks' public lecture closed out the evening. Preceding the last event, students gathered for a panel discussion on "Research in Math and Science", followed by a pizza dinner. The variety of student activities offered "something for everyone", from youngsters (who loved the computer games), to high school and undergraduate students, and through to graduate students, who benefited from the research talks.

After the contributed talks concluded on Saturday morning, many participants headed to the nearby Clark Fork for the now traditional whitewater excursion. Thirteen paddlers and two guides piled into two fourteen-foot rafts for an afternoon float. The exciting rapids, the beautiful scenery, and the variety of wildlife made for a perfect conclusion to a successful conference.

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like a Zen challenge."

For those of us who are science-impaired, Weeks said not to worry—his talk will not be a crash course in physics, cosmology or math.

"The talk is really aimed at the middle school audience," he said. "There will be lots of pictures, and this topic lends itself to using computer games. Basically, I plan to sneak the science in through the back door while we are playing."

Once the audience is warmed up with visions of things that are contained, Weeks will launch a tour of several possible shapes of space, and talk about how the NASA satellite data could reveal the true shape of the universe.

As a veteran of listening to frustratingly complicated lectures, Weeks said his vow at every public talk he delivers is to stay the course with one main theme.

"I know I would much rather come away from a talk feeling like I have learned one idea than be really confused by three," he said.

Weeks said he encourages everyone who loves to contemplate the universe to come hear the latest developments science is making in figuring out this great unknown.

"The only prerequisites for this talk are curiosity and imagination," he said. "This has always been an exciting topic, but it is very timely because it is being tested now."

After the number-crunching and theorem-testing is completed, Weeks said he believes the world may learn as soon as January that the universe does not go on forever. Or, maybe the question will remain unanswered.

No matter what the outcome may be, the journey is thrilling.

"From a mathematician's point of view," he said, "I didn't think there would be an opportunity in my lifetime to test the real shape of the universe."

Weeks has an undergraduate degree from Dartmouth College and a doctorate from Princeton University, both in mathematics. Currently a MacArthur Fellow, he splits his time between research and education.

A Conversation with Johnny Lott

Professor Johnny Lott is six months into a two-year term as full-time President of the National Council of Teachers of Mathematics (NCTM), the largest math teachers' organization in the world. Professor David Patterson spoke to him recently about his job.

Patterson: *What is the National Council of Teachers of Mathematics and what does it do?*

Lott: NCTM is an organization of about 100,000 teachers in the U.S. and Canada in K-12 and higher education. It's the largest math teachers' organization in the world. The mission of NCTM, in a nutshell, is to present all kids with more and better mathematics for the future. It does it through journals (four print journals plus a new electronic journal available at www. nctm.org*)*, book publishing, conferences (six regional conferences each year plus a national meeting attended by over 20,000 people), and academies or institutes, about 40 this year, which are basically in-service for math teachers.

What was your path to the Presidency of NCTM?

I became a member of NCTM in 1965 as a college senior. When I came to Montana in 1974, Rick Billstein encouraged me to become a member of the Montana Teachers of Mathematics (MCTM), a state affiliate of NCTM with only about 500 people. It's a very active little affiliate of NCTM. Eventually, work with NCTM led to appointment to a national committee, editorial panels, and the editorship for several years of Math Education Dialogues. Then I was elected as a member of the Board of Directors of NCTM and eventually President. It's a four-year commitment, one year as President-elect, two years as President, and one year as Past-President. I'm in my first year as President. It's a long-term commitment to an organization I believe in.

Was it the SIMMS grant that gained you the national recognition in mathematics education necessary to be elected

President?

The SIMMS grant is one thing that helped. [The SIMMS grant – Systemic Initiative for Montana Mathematics and Science – was a 5-year 10-million dollar National Science Foundation grant, for which Johnny was a co-

Johnny Lott

Principal Investigator. SIMMS was awarded to MCTM to develop new curricula for high school mathematics. - *Ed.*] The other is that MCTM is known nationwide, going back a long way. Bill Stannard was the first Montana member of the NCTM Board of Directors. He's long since retired from Eastern Montana College [now Montana State University-Billings]. Dan Dolan, who was at the Montana Office of Public Instruction, was on the Board. And there have been Montana teachers on the Board – Earlene Hemmer of Belgrade, Karen Longhart of Kalispell and, currently, Mary Buck from Helena. We've had a disproportionate number from Montana on the NCTM Board for such a low population state.

Why is that?

Montana math educators at all levels work hard. MCTM has been a mover in what's going on in this state at all levels. We were able to get a million dollars from the state for technology for the schools in the early 90's. That came really as an effort of SIMMS and MCTM.

One of the things that has

happened here that hasn't happened many places is the school people and the math educators at the colleges and universities have worked closely together for a long time on many different projects. MCTM was one of the first state organizations to get an NSF grant. One of the reasons we can do it is because we're small. Over the years, the college and university people have appreciated the teachers at all levels and the organization has been strong because of it.

What do you do as President?

My schedule is hectic. We've had five regional meetings this fall – Montreal, Biloxi, Paducah, Regina and Boston. The President is always at these meetings as NCTM's representative. I arrive Tuesday night and spend all day Wednesday, before the meeting starts, visiting local schools, teaching classes (from elementary to high school), doing TV interviews, and meeting with the local organizers. Thursday through Saturday, I'm in meetings all day. In addition, there's a President's Address and an open-mike session. By Saturday night I'm exhausted. I fly back to Missoula on Sunday, work in the office on Monday and Tuesday, but typically fly to another meeting Tuesday afternoon.

I work with the Budget and Finance Committee on the $17 million annual budget, meet with 13 major committees, write a monthly column for the NCTM News Bulletin, and represent NCTM to congressmen and women, the Conference Board of Mathematical Sciences and, occasionally, the National Academy of Science.

What are the major issues NCTM is working on?

Because of the situation with the Department of Education and mandated state assessments, NCTM is considering whether it should become a political advocate in a big way for mathematics education. It has always been an advocate for math education, but it has pretty steadfastly stayed out

of the political arena. It'll be a philosophical change for the Council if we do that.

Another issue that the Council is faced with is how to help teachers and school systems think about tests and assessment – which ones are valid and what can you do to help teachers get ready for this? That's not a trivial task. The Council has in the past refused to endorse specific curriculum or assessments. Now every state is having to do this. What kind of guidance can we give to teachers to help them? That's our real goal: to help the teachers so that they can eventually help the kids.

We've always said in the past that it should never come down to a single measure that determines anything for a child. We're almost getting forced into it with all the high-stakes testing and the tests required for high school graduation. Assessment is a big issue for us.

Another big issue coming, again out of Washington, is the call for scientifically-based research in math education. Much of the research that has been done over the past 50-60 years is being dismissed because it wasn't done like medical research with random assignment to treatment and control groups. Schools are being told that the curriculum they use needs to be scientifically-based, but, at the same time, they don't want children being experimented with. There are many ethical issues here, and we're having real trouble with this one. NCTM has never supported a national curriculum or a national test, but we're getting pushed awfully closely in this direction and it's scary.

Any final comments?

Being President of NCTM is a challenging job. I didn't know all that was involved when I got into it. But when you cut through everything NCTM is doing, it's all about trying to provide more and better mathematics to students.

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internationally has been unbelievable,? Billstein said.

MATH Thematics snags the attention of middle school students with full-color graphics and photographs, as well as engaging writing and dramatic problems. In one seventh-grade module, for example, students must use their math skills to find and rescue fictional kids whose plane has gone down. By the end of the lesson the students have learned to measure angles, do compass headings, plot a pilot's course and read contour maps. Students get excited about learning math when confronted with practical examples that demonstrate math's many uses – even saving lives.

Billstein said MATH Thematics is a move toward giving students the skills to figure out problems themselves and a move away from multiple-choice tests and rote memorization of formulas.

Since it has gone into use, MATH Thematics has earned high marks in professional evaluations. Project 2061, for example, which recently completed the most thorough and rigorous study of math textbooks in the Unites States, listed MATH Thematics among only four series with satisfactory curricula. When it was being tested, students using MATH Thematics significantly outperformed control groups not using the series.

Much of the new funding Billstein has garnered – about $3.9 million worth – will be used to revise and update MATH Thematics. The effectiveness of the series will be re-evaluated, student and teacher materials will be brought up to date in regards to advances in technology, a workable set of parent materials will be added to the program, and new materials will be designed for students with special needs. More multicultural materials also will be included, and the entire series will be made to conform to the new Principles and Standards for School Mathematics, which were designed by the National Council of Teachers of Mathematics.

Billstein said the essential team members for the revision, which is titled Middle Grades MATH Thematics Phase II, will be his UM colleague Williamson; Jean Howard, a Helena middle school teacher and president of the Montana Council of Teachers of Mathematics; and Lyle Andersen and Ted Hodgson, both math faculty members at Montana State University-Bozeman.

Billstein also has landed another NSF grant worth $825,000 to fund a satellite center of the Show-Me Project at UM. Headquartered at the University of Missouri-Columbia, the Show-Me Project works to reform and update middle-school math curricula nationally with the use of more standards-based material. MATH Thematics is one of four curricula alternatives promoted by the project.

Show-Me officials estimate that about 4,000 school districts now use some form of the standard-based materials they promote, but this represents less than a quarter of all U.S. school districts, so more effort in this area is needed. In the past the project has been widely recognized for its curriculum showcases and informative Web site, located online at www.showmecenter.missouri.edu.

Billstein said the new MATH Thematics and Show-Me grants, the funding for which both started in September, have positioned UM to play a major role in how mathematics is taught in U.S. schools. He and his math department colleague Professor Johnny Lott already have had a huge impact by co-authoring ?A Problem Solving Approach to Mathematics for Elementary School Teachers,? the best-selling book in its field since 1980. The book is in its seventh edition, and an eighth edition is coming out next year.

A Billings native, the 58-year-old Billstein earned his master's and doctoral degrees at UM and has taught at the University for more than 30 years. He has co-authored 22 books and written more than 50 articles for prominent teachers' journals. Every summer, using various grants, he also brings 150 to 200 teachers to UM for additional training in mathematics and use of the new curriculum.

New Faculty

We are pleased to announce that two new tenure-track faculty joined the department this fall.

Adam Nyman, an algebraist, received his Ph.D. in noncommutative algebraic geometry from the University of Washington in 2001 under Paul Smith. He and his wife, Gabo, moved here from Pomona College, where Adam taught last year. Adam shares an interesting connection with

Adam Nyman

Associate Professor Nikolaus Vonessen. Adam received his undergraduate degree in physics from MIT, but he wasn't happy with all the "hand-waving" in his physics courses and switched to mathematics. The MIT professor who was most instrumental in convincing him to switch was Michael Artin, who was Nikolaus' Ph.D. advisor.

Bharath Sriraman joins our math education group. He received his Ph.D. in math education from Northern Illinois University last spring after getting a B.S. in mathematics from the University of Alaska in 1995 and an M.S. in mathematics from Northern Illinois. His area of interest is problem-solving using combinatorics. Bharath and his wife Sabena have a 4-year old daughter, Sarah.

In addition to our new tenure-track faculty, we also have several new visiting and adjunct faculty. Greg Cripe, who received his Ph.D. in applied mathematics in our department last spring under Professor Leonid Kalachev, is serving as Leonid's sabbatical replacement. Arturo Magidin, an algebraist who received

Sabbatical in Slovenia

by Mark Kayll

Slovenia? Why would I spend my sabbatical in Slovenia? Is it near Slovakia?

These questions typify the responses to my plan for the 2001–02 academic year, which I spent in the small central-European country that borders Italy on the West, Austria to the North, Hungary on the East, and Croatia to the South (but not Slovakia). In a recent *Pi Mu Epsilon* issue (Vol. 11, 2002, 385–386), my new friends and colleagues Marko Petkovšek and Tomaž Pisanski shared this interesting tidbit:

> According to a legend, *Ljubljana*, the capital of modern Slovenia, known as *Emona* in Roman times, was founded by *Jason and the Argonauts* when they were fleeing on the ship *Argo* with the *Golden Fleece…*

This capital—a city of 300,000—was my home for the year as I visited Bojan Mohar, a preeminent graph theorist at the University of Ljubljana. My wife and I lived in a two-room apartment in a converted horse stable, but before images of leftover oats and hay take over, I should add that the city's mayor lived two floors above us; by local standards, we lived comfortably.

The richest of the former Yugoslav republics, Slovenia enjoys a relatively strong economy, high education standards, and a universal appreciation of both the arts and outdoor recreation. Elan skis are a Slovenian product, as is Pez (both the candy and dispenser!). Their colorful currency depicts Slovenian writers, historians, artists, scientists, architects, and musicians; these include the romantic poet France Prešeren and the mathematician Jurij Vega.

The combinatorial complexities of the language, Slovene, make it a challenge to learn. Here is one example: in addition to the usual singular and plural forms, they have a *dual* form, reserved for discussing exactly two objects. Luckily for visitors, English is the primary second language, which, in a country with just two million Slovene speakers, is taken seriously and practiced cheerfully.

I highly recommend a visit to Slovenia by anyone who likes mathematics or traveling. Its central location makes it a perfect base for trips to Venice, Munich, Salzburg, Vienna, and Budapest, whether for touring or collaborating. And its green rolling hills, backed by majestic Julian Alps, make it a wonderful country to explore on a weekend outing. Did I mention the caves? Well, some things should be left as surprises.


Bharath Sriraman

his Ph.D. in 1998 from UC-Berkeley and has been teaching at the National University of Mexico, is serving as

Nikolaus Vonessen's sabbatical replacement. Tom Dick, professor of math education at Oregon State University, is spending his sabbatical in our department working with Libby Krussel. Mark Lutz, a retired middle/high school math teacher from Dayton, Ohio, has joined our department as an adjunct instructor.

Finally, Carol Ulsafer and Regina Souza, who have been adjunct faculty for the last few years, were hired to fill newly-created Lecturer positions. Carol received her Ph.D. from the University of Montana and worked for a number of years for Educational Logistics in Missoula. Regina received her Ph.D. from MIT.

Math Club Corner
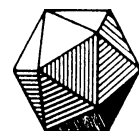
by Matt Graves
UM Math Club President

The UM Math Club had a great semester. We had guest lecturers; we played games; we built a website. All in all, it was very productive.

In September, we held elections and discussed ideas for things to do during the semester. We used some of our meetings to discuss and explore the ideas presented by Dr. Jeff Weeks in his lecture "The Shape of Space". We finished off the month by inviting Jen Corp, a UM alumna with a Masters degree in Mathematical Sciences, to talk about her experience as the manager of operations at Logistic Systems. We also discussed the versatility of a math degree outside the field of education.

October started off with Professors Tom Tonev and Mark Kayll showing us firsthand what it was like to attend the International Congress of Mathe-maticians. They presented slides and souvenirs from the years they had attended, and told stories about their experiences. Dr. Jenny McNulty also spoke in October; her presentation, "Million Dollar Mathematics", was about some of the most challenging and important mathematical problems in the world, and how there is a reward out for the first person to solve them! We screened a film, "The

Fantastic World of M. C. Escher", which both biographed the man and explained some of the mathematics behind his work. Finally, we held "An Afternoon of Gambling", which I'm sure we'd all like to see become an

"An Afternoon of Gambling", October 2002

annual Math Club event. We had tables set up for games like Blackjack, Keno, and Craps, and we had fine lectures by statisticians Jon Graham and David Patterson on Craps and Blackjack, respectively. Prizes were awarded, and a good time was had by all.

November had us busy thinking about "The Mathematics of A Beautiful Mind", a two-part lecture series by Dr. Robert McKelvey and graduate student Chris Corbin. This series taught us first about the life of John Nash (the mathematician about whom the film "A Beautiful Mind" was made), and then about the mathematics which made him famous, namely his Theory

of Cooperative Games, the Bargaining Solution, his Theory of Non-cooperative Games, and the Nash Equilibrium Solution.

At this writing, the Math Club is selecting a book for members to read over the holiday break. We also had a lecture by Dr. Johnny Lott, the president of the National Council of Teachers of Mathematics, the largest mathematics teachers' organi-zation in the world, and ended the semester with a pizza party.

The UM Math Club meets Tuesdays during the school year from 3:10 until 4:00 p.m. in the Math Building. The public, especially alumni, are always welcome to attend.

The Math Club is always on-the-lookout for guest speakers and lecturers. If you or someone you know has (or has had) a job that requires math, or if you are well-versed in a particular branch of mathematics, we'd like to invite you to come and speak to us. Please contact us for more information by visiting our web page at www.math.umt.edu/~mcnulty/mathclub/.

UM Math Club

President:	Matt Graves
Vice President:	Rob Loflin
Secretary:	Tiffany Horsch
Treasurer:	Nick Miller

Advisors: Jenny McNulty & George McRae
other active members include:

Young-A Choi	Elizabeth Roberts
Gail Yeomans	

Department Seeks Logo Design

Here's your chance to be creative and maybe exercise a different part of your brain! The Department of Mathematical Sciences is in search of a logo, and we are sponsoring a contest to generate ideas. To submit an entry, send your proposed logo, along with a short description of why the image suits our department & your contact information to:

Logo Contest
Dept Math Sciences

University of Montana
Missoula MT 59812-0864

The deadline is 15 March 2003. Entries will be reviewed by a contest panel, with the winning logo unveiled and contest winner announced during Math Awareness Month, April 2003. The grand prize is $100, plus the opportunity to have your logo adopted by the department. We plan to display the logo wherever a graphical presence

is called for.

There are only a few ground rules for the contest. No logo that is presently copyrighted will be considered. All logo submissions become the property of the Department of Mathematical Sciences. The winning contestant will need to release copyright on the submitted logo.

So get your creative juices flowing, and conjure up a logo for the department. And don't worry if you're not artistic — we'll polish the winning entry with the help of a graphical artist before unveiling it.

CLTW Grant

The Center for Learning and Teaching in the West (CLTW), directed at UM by Dr. Libby Krussel, has entered its second year. The Center, a regional consortium of five higher education institutions, including UM and MSU, is funded by the National Science Foundation. CLTW is committed to conducting research aimed at improving mathematics and science achievement, from middle school though university, among student groups traditionally under-represented in these fields. We are engaged in on-line doctoral course development, professional development for math and science teachers, and enhanced multi-cultural experiences for pre-service math and science teachers. We are currently funding one Faculty Fellow, Professor Thomas Dick from Oregon State University, who is visiting the UM mathematics department this year. Three doctoral students are also funded: Emily Geraghty in Geology, Debbie Sloan in Mathematics Education, and Amanda Whittemore-Olson in Forestry. Emily is assisting Dr. Dick with course development, Debbie is assisting the project evaluator, Dr. Jim Hirstein, with evaluation of our programs, and Amanda is working with Dr. Georgia Cobbs supervising pre-service math and science teachers completing their field experiences on the Blackfoot reservation.

Fellowships are available for next academic year for those interested in pursuing a doctorate in mathematics, the sciences, mathematics education, or science education. For more information, contact Sheila Bradley at Sheila.Bradley@mso.umt.edu or Libby Krussel at krussel@mso.umt.edu.

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