



Math prof to posit old puzzler to public Speaker bridges brain teaser with DNA

By **BETSY COHEN**
of the *Missoulian*, 9/6/2001

The University of Montana's math department will be host for an evening of intellectual adventure Thursday that promises to engage even the people who are severely allergic to math.

The tour guide is renowned mathematician Herbert Wilf, a University of Pennsylvania professor and author who is well-practiced in communicating the world of numbers and formulas to those who are reluctant to travel there.

The journey begins in 18th century Germany in the town of Königsberg. There, the river Pregel runs through town and splits at an island. Once the river passes the island, it flows into one fluid body again, and then splits in two at a jutting finger of land. The community built seven bridges to connect the townsfolk to both pieces of land.

Where the math comes in, Wilf said, is that the townsfolk back then wanted to know if it was possible to walk around the city in a way that would involve crossing each bridge exactly once.

A mathematician by the name of Leonard Euler took on the challenge and in the process came up with a groundbreaking mathe-

matical solution to the problem, which today carries his name.

In the end, after much math and much mapping of points and paths, he proved that it was impossible to travel the area by crossing each bridge exactly once.

The mathematician's unusual exercise also left a different kind of map for future puzzle decoders, in particular, one biochemist who took Euler's solution and applied it to DNA sequencing.

In essence, Wilf said, the theoretical question asked by some curious townsfolk in Germany in 1730 led researchers in the late 1990s to complete the massive venture in mapping the human genome.

"And the solution to all of this, is really a very simple, elegant answer," Wilf said on Wednesday.

"That's the beauty of it. And it is relevant to the greater the public, not just mathematicians, because lots of problems in the world come down to similar questions of the Königsberg bridges."

On Thursday, Wilf will discuss the finer points of how Euler came to his solution. Through lots of map drawing, he'll explain why the solution is the solution and how it opened the portal for scientists' human genome mapping mission.

"We deliberately pick people who will be accessible to the general public," said Mark Kayll, UM associate professor in mathematical sciences and organizer of the event.

"Herbert Wilf is a really experienced speaker, who has won numerous awards for his teaching,"



Professor Wilf outside the Math building last Fall

Biography of Merle Manis, Algebraist in Department of Mathematical Sciences

By Rudy Gideon

Merle Manis started as a full-time professor in the fall of 1965 and ended his career in the spring of 1996. Merle never felt he “studied” mathematics, but just played around with mathematical ideas. He directed 7 Ph.D. students, which is currently the most in the department and numerous Masters students over that time. As steady a professor as he was, his history makes one wonder how he ever became one. Merle attributes it to luck. Let the readers judge for themselves.

Merle was born in the Mission hospital at St. Ignatius, Montana in 1934. His birth weight was 3 lbs and 4 ozs and he was only 12 inches long. The birthing nurse told his mother to take him home at once. She gave instructions to keep him in a box behind the kitchen wood stove, don't handle him except to feed him every two hours and swaddle him in absorbent cotton and he might live. The nurse said if you stay in the hospital at all with him, he would surely die. This nurse had violated policy! With such a slow start Merle walked at 9 months even though he was only 18 inches tall. His father was killed on “April Fools Day” 1944 in a sawmill accident, where he was working to support a small farm. His mother unsuccessfully tried to support the family consisting of Merle and three sisters with minimum wage clerk jobs in Bremerton. At the beginning of the seventh grade, when he was big enough to be useful, Merle returned to Charlo and worked for his keep on relatives' farms through high school, graduating in 1952.

In the fall of 1948, his freshman year of high school, there was a teacher shortage, especially in small schools in Montana, and as a consequence, the school seldom got the best candidates. The most bizarre of the teachers hired was the math-science-coach. In the

coach's class in first year algebra, he gave a test, collected the papers, read the names aloud, assigned a grade and passed them back. Most boys got F's but some girls fared a bit better. Also that first day when the teacher showed up on the football field to coach, the boys refused to give him the ball and played “keep away” from him. He left the field crying, never to return. The second day of algebra, the teacher walked up to his desk after giving and collecting another test, and announced that the students probably did not do any better, threw the tests away, and entered the previous days grades. Discipline problems developed, or, rather, bedlam ensued. For almost six weeks the class either ignored him or harassed him as he stood at the blackboard lecturing with his back to the class and for the most part oblivious of what was happening. At one point he noticed, stopped and informed Merle that he had a gun and could shoot him in the guts and be justified. The same threat was made the following day and again the next, after which Merle fired a cap gun he had brought for the occasion. The teacher ran from the room to the principal's office to call the sheriff to come and make “them boys” behave. He was fired on the spot and the principal denied any knowledge of what had been going on.

The boys had to coach their own 6-man football team that season. Merle thinks this teacher was certifiably crazy.

Thus, Merle survived this act of stupidity and there were no overt repercussions to him or anyone else in the student body. He was apparently identified as a troublemaker to the replacement teacher, for on days when an exam was not being given, the following ritual was observed: Merle would enter the classroom but before he could reach his desk the teacher would announce “I believe we can do without

your presence today Mr. Manis” and Merle would go downtown and shoot pool for an hour before returning to school. Merle's eighth grade teacher, a very large woman, once lifted Merle up out of his desk by the hair while beating him on the back with a yardstick and was also one of several of his grade school teachers that cried because he was “throwing his life away.” She had placed him in the back of the room with instructions to study high school algebra as punishment. Merle taught himself algebra during the many hours he spent there after she learned that it kept him out of trouble. Thus, Merle was able to pass the exams easily.

In his second year, Merle had the new principal-math-science-coach for geometry. Merle loved the axiom-theorem-proof organization of the text and rapidly worked himself well into it during class time. The instructor, after calling on Merle a few times to counter his inattentiveness, ascertained that he was not going to teach Merle any geometry that he couldn't teach himself. He informed Merle that he didn't want him to attend geometry class anymore and was no longer required to attend any class as long as he could take and pass the tests and show up for football practice. This arrangement remained in effect for the remainder of his high school years. Merle did continue to attend classes occasionally, some even semi-regularly. The only course in which he did any work was in a physics course that was being offered for the benefit of the superintendent's son who planned to go to college and become a “scientist,” a goal that Merle considered laughingly unrealistic since it was clear that he wasn't any smarter than Merle. Merle took the course to demonstrate that, and he did.

Merle enjoyed high school. He played varsity football three years (state class C champions his junior year) and varsity basketball (district and division

champions, didn't do well at state). The teachers at Charlo went out of their way to keep Merle in school long enough to receive a diploma and even arranged for a scholarship in Butte, the Montana School of Mines, which he declined. In retrospect, he was not mature enough to go to college at that point anyway.

After graduation Merle took a job in the huge sawmill at Libby Montana, got bored after less than two weeks and hopped a freight out with a friend who had recently received a bad conduct discharge from the Air Force. After a couple of months of riding freights, sometimes with even worse company, he turned 18 and gave up the life of a transient (knowing full well that he was headed for serious trouble if he didn't) and hitch hiked to Spokane, where his mother was living. He then spent what seemed to be an eternity being unemployed and depressed with an occasional odd job. He picked apples (3 days) and beans (long enough to earn ten cents for the bus back to town) and then got a steady job at the supply depot for the Great Northern railroad. He was working there when a friend came to Spokane to apply for the Air Force aviation cadet program. They were flying applicants to the Bay area for a week of tests, which was enough to convince Merle that he should also apply. They took about 20 hours of tests of various kinds. The friend failed, Merle didn't.

Aviation Cadets was a two-year program that trained pilots and navigators for the Air Force and the precursor of the Air Force academy. Two years of college was necessary for pilot training so Manis only qualified for navigation training. After two successful years the cadet would be awarded an officer's commission, then required to serve another two years active duty.

The attraction of the program was that the initial enlistment was for only two years, no matter what, and one could resign from the program at any time finishing the enlistment in the regular Air Force. His options were to wait and be drafted into the Army for two years or enlist in one of the services for four

years. It was a no brainier and he started Aviation Cadet preflight training at about 2 a.m. (or at 0200) one morning toward the end of January 1954, at Lackland Air Force Base, San Antonio Texas, after spending sixteen hours getting there because of bad connections. What he didn't know was that Aviation Cadets was also known as the Tiger Program because of its well earned reputation concerning the ferocity of the physical and mental harassment of new cadets. Manis would have resigned on the spot if he had known how, but after several weeks of nonstop hazing designed to break the cadet, there was nothing the upper class (those cadets that had already survived six weeks of hazing) could do to make him resign. Preflight was a psychology lesson and a valuable life lesson he will never forget. He never regretted going through it but would never recommend it to anyone he liked.

After preflight school, Merle went to Harlington in the most southern part of Texas for flight training. Again he was lower class but had learned that one could avoid the upper class if one spent all one's time when not eating, sleeping, or in class, in the Cadet Club. With the hazing pressure off and the "academic" content very elementary, Merle considered his options. He still did not know what he wanted to do; but he knew that being a flying bookkeeper was not it. He was turned off by the elitism that was being taught to the prospective officers, so he turned in a letter of resignation. It was ignored, so he turned in another and skipped a flight, which got attention. Manis was standing second in the class academically so Merle was interviewed by several people who tried to convince him that he was making a huge mistake by resigning. His last interviewer was the base commander, a bird colonel, who inquired in a fatherly manner and tone as to what was the real reason Merle wanted to resign. Manis replied, "Sir, I have nothing against officers as individuals, I just don't want to associate with them as equals". The resignation was accepted.

When Merle transferred back to

Lackland for reassignment, his personnel file contained a letter from the commander specifically not recommending him for anything because of his negative attitude, so he was quite nervous when he went to be assigned a job classification. He was told that he could go to any school the Air Force had, including officer candidate school but excluding Aviation Cadets. He was also offered his choice of any on-the-job training program they had. So much for the non-recommendation! He chose "information and education" by OJT for no good reason and was assigned to San Marcus (Texas) AFB.

He was met at that base by a very enthusiastic editor of the base newspaper who had been wowed by Manis' test scores and was going to be discharged in two months. He planned to train Merle to take over the editor position. At the end of a month Manis was able to pass the test for this position at the highest noncom level and assumed the editor's position. Merle now had legal (actually nominal) authority over four enlisted men with the lowest ranking one outranking Manis by two grades and the highest (a tech sergeant) by five. Two had BA's, one had an MA while only the tech sergeant had high school like Merle. The catch was, the sergeant was not bright and the other three hated each other and each was willing to work for Merle but not for either of the other two! Everyone wore civilian clothes so the difference in rank was neither visible nor important.

After fifteen months as the editor, Merle was discharged in January of 1956 with the full thirty-six months of GI Bill entitlement (it paid \$110 a month at the time when fees were about \$60 a quarter). He had decided to give college a try and go back in the service when he flunked out. He worked a little and goofed off a lot for the next eight months and entered the University of Montana in the fall of 1956. He still didn't know what he wanted to do but he figured anything of interest would require mathematics so he decided get that out of the way first, if he couldn't do the math he couldn't graduate from

college. Merle's background from Charlo was ideal for learning mathematics. Merle claims he was better prepared academically when he finished eighth grade than when he finished high school, where he defines academically prepared as able to obtain knowledge, and knowledge as facts. Merle left Charlo HS with a complete and total lack of good study habits and techniques, which turned out to be very lucky for him. Since he couldn't study mathematics he was forced to understand it.

Merle played it safe by starting in intermediate algebra, followed by college algebra, trigonometry and analytic geometry in his freshman year. He still has very little knowledge in these subjects but can derive knowledge easily and

quickly when it is needed, uses it and then promptly forgets it. Fifteen credits of math as a sophomore and twenty-one as a junior left him with more credits in math than he could apply for graduation when he started his senior year. By designating five math credits as education credit, eight as graduate credit, and twenty unassigned credits he received for military experience, Merle was able to take twenty-six credits in his senior year and still satisfy graduation requirements.

Credits were not the problem for graduation, German was. Merle had put off starting his language requirement until his junior year when it looked like he might actually graduate, but try as he might he never found a way to make his lack of study skills work to his advantage in this subject. He was a classic reluctant learner. He got a C the first quarter. He never showed up for class the second quarter, and the instructor insisted on giving him an incomplete, which he had to petition to have changed to an F so the retake would count as part of a load. A grade C on the retake was followed by a D for the third quarter. His instructor for the fourth

quarter seemed surprised when he saw Merle registering for the fifth quarter and asked him what grade he had received. When Merle said the transcript showed a C. The instructor allowed that he must have been feeling good when he as-



Merle Manis in 1981

signed it, since Merle had exhibited the worst grammar he had ever encountered, not surprising since he did not know what the word conjugate meant. With graduation depending on passing the fifth quarter, Merle was astounded when the instructor informed him that he had a C going into the final and as a graduating senior could either take that grade or take the final with a chance for a B. He gratefully took the C and graduated with a BA in the spring of 1960. Lucky Merle-again-

Thanks to Sputnik, money started flowing his senior year. Since he started taking courses with graduate students as a junior and was not intimidated, Merle decided he should try for a masters degree. He applied for and received a NSF co-op fellowship that started fall of 1960. Manis loved to be only taking mathematics. He carried nine class credits a quarter while doing research to write a thesis in algebra. He completed the requirements in nine months and received an MA in the spring of 1961. He learned more mathematics per unit time that year than any other time of his life. Merle also started a romance with his then future, now present wife, Roberta.

Merle, as the reader probably has ascertained, suffered (and still does somewhat) from a massive intellectual inferiority complex common to graduates of small high schools. He did not consider himself Ph.D. material and did not want

to continue in graduate school. Because he had not diligently pursued employment, he had none, so he accepted an unsolicited offer of a teaching assistantship from the University of Washington, bid Roberta goodbye and went to Seattle.

At the end of October, Roberta called and said "come and get me." Merle made a quick trip to Missoula and they were married in Idaho on the way back to Seattle. Merle took the German exam

at UW and failed it miserably. Convinced that he could never make himself learn enough to pass the UW type exam, he decided to drop out. The UM math department needed a replacement for Howard Reinhart, who was on leave, and upon hearing that Merle was dropping out, called and offered the position. The departmental New Years Eve party was ruined for Merle when the chairman informed him that he would be teaching the mathematical statistics course, at that time considered one of the hardest courses on campus. Merle had taken the course as a senior, but it was the only statistics he had. Classes started in two days and all the students in the class would be fellow graduate students from the previous year and the only teaching experience he had was the evening college algebra course he had taught at UW the previous quarter. Merle not only felt unprepared, he was. He was ready for the first class and comfortable by the end of the month. He learned far more teaching the course than he did taking it and some of the students even seemed to have learned a few things.

Merle was told he would be hired for

(Continued on page 6)

the following year only if he applied for a NSF fellowship for further graduate work. The University of Oregon was his school of choice since the format of their language examinations made them appear passable for Merle. He got an early indication that he would get a fellowship when he received registered mail from NSF containing his application with directions that he should sign it and return it immediately. The fellowship support was generous, Roberta wanted him to continue and Montana was certainly not going to hire him if he refused it. Later, the University of Oregon wrote saying they were glad to hear that he was coming and would he please fill out and return the enclosed admittance application. He complied, accepted the fellowship and entered their graduate program in the fall of 1963.

Merle wanted to do thesis work with David Harrison. He signed up for his advanced seminar because he felt it was necessary to make Harrison want him as a student. Merle had to hustle to acquire the necessary background for the seminar, but was current and contributing in a couple of weeks. At midquarter, Harrison asked Merle to start working on problems with him!

To "be safe" Merle had taken second year graduate algebra and topology his first quarter but dropped them since he already knew the material. The chairman later mentioned that he had caused them some problems but not to worry, things were taken care of. When Merle got his grades at the end of the quarter he concluded that dropping the class had put him below a credit threshold, since he had grades for a couple of reading courses he hadn't registered for. He always took enough credits after that. Merle contributed a couple of results and several proofs in the second quarter of Harrison's seminar and contributed heavily in the third quarter. In retrospect, he had done enough for a respectable dissertation. Late in the third quarter Merle asked the chairman when qualifying exams were to be given, since he thought he should take them. "Oh," the chairman said, "didn't anyone tell you, we waived those for you." Merle never took them and the subject never came up again.

The first summer Merle decided to take the German exam which consisted of translating a half dozen pages (selected by the language department) from a book (selected by the math department) with the aid of a dictionary. When Merle opened the exam he could read the title at the top without the aid of a dictionary: "The Fundamental Theorem of Galois Theory." The exam consisted of the statement of the theorem and a proof! By coincidence, the last two quarters of Harrison's seminar had been about generalizing Galois theory to commutative rings. Merle could state and prove the theorem in a dozen different ways, in his sleep. So he stated it and proved it, being careful to give the same statement and proof that was on the exam. Passed German, French to go. Problem: has never had any French.

Merle didn't enjoy his second year at Oregon as much as the first. He had another NSF fellowship and enjoyed a couple of seminars, but he really didn't like the stuff Harrison was trying to do. He was trying to do number theory on a commutative ring but it didn't look like it was going anywhere to Merle. He had these things he called valuation pairs that were kind of neat but didn't do much in a ring. Merle had dutifully proven a lot of things but he didn't think they were of interest or value (there was enough for a thesis when Merle abandoned his work and told Harrison he could give it to another student).

At the end of the second year, a student that Merle can't remember, loaned him a book that Merle can't remember, on number theory, commenting that he thought Merle might enjoy it. Merle had read about halfway through the introductory chapter on valuation theory on fields, when he said to himself "I can do all this stuff for a commutative ring." He spent most of the night making sure he was right and tossing and turning for the rest of it. He was pretty sure that he had a thesis for he knew Harrison didn't know what he had and suspected that no one else did either. Merle waited impatiently until ten o'clock and asked Harrison why he wasn't using the valuations that went with his valuation pairs. His answer was immediate, Harrison gave book, chapter and exer-

cise where he said the Bourbaki had proven that they didn't exist. Merle checked the reference and called Harrison back to explain that all they had proven was that they had the wrong definition for "valuation" and that he had the right one.

Merle knew he had a thesis. He had done something a group of the best algebraists in the world had tried to do and failed. He spent the rest of that day checking that he could establish the basic theory for rings using the known results for fields, but he wanted more, he wanted the theory for rings independent of fields (which would include the theory on fields as a special case). In three days of working almost nonstop he had what he wanted with a bonus: the proofs were easier in the general case than in fields and the theory was much more natural! Basically, his dissertation had been done in one week. A special class of subring is now called a "Manis ring" and valuations on a commutative ring are still actively studied today.

Merle still had a French exam to pass and since he had an NFS fellowship again, he decided to stay another year. Earlier, Merle had told Harrison that he had to have some time to study French and he got an emphatic no. Harrison explained how the passages were chosen and promised to send over a Bourbaki book on commutative algebras and given how well the authors wrote and how familiar Merle was with the subject, it would read like English. Merle got the book and agreed. He would have to learn a few words, but not many. He relaxed and would occasionally look at the book. That summer, the day before the French exam, Merle tried to comfort a friend who was worried about the exam by telling him what it was to be. No, the friend said, Harrison didn't send over the book, an analyst did. It was too late to worry, so Merle took the exam anyway. The passage could not have been easier. It was mostly equations, which go into English unchanged, and the mathematics was so easy that one knew what the words had to be saying about the equations. Manis was concerned that the exam was so easy that it would be tossed out. It wasn't, Merle passed, re-

(Continued on page 7)

► **Rick Creed** (BA 1985) has recently won the Gwinnett County Teacher of the Year Award!

► **Rena Hinman (Tintzman)** (BA 1990, MAT 1997), teaching Algebra and Advanced Math at Whitefish High School, had a daughter born on April 1, 2001!

► **Fat Lam** (Ph.D. 1987), is now a new chairman of the Department of Mathematics and Computer Science at Gallaudet University, the world's only liberal arts College for the deaf.

► **Brett Loomis** (BA 1995, MS 1997-UNC), is currently at the Research Triangle Institute evaluating the effectiveness of state and national tobacco control

Summer 2002 Mathematics Education Graduate Courses at The University of Montana

The summer 2002 schedule of mathematics classes for teachers is as follows:

MATH 530 *Geometries for Teachers*
June 10 – June 28
9:00 – noon daily for 3 weeks

Investigation of synthetic, analytic, vector and transformational approaches to geometry. We will study the new *Navigations in Geometry* publication from NCTM.

MATH 504 *Topics in Mathematics Education – Geometry*
July 8 – July 12
8:30 – 4:30 daily for 1 week

This is a new course, **designed specifically for middle school teachers**. We will investigate many different aspects of geometry – analytical, transformational as well as synthetic. We will use NCTM's new *Navigations in Geometry* and Geometer's Sketchpad to aid in the investigations.

MATH 540 *Probability and Statistics for Teachers*
July 15 – August 2
9:00 – noon daily for 3 weeks

A survey of modern topics in probability and statistics. Emphasis will be on applications of statistics in real situations.

(Continued from page 6)

quirements for the Ph.D. were essentially complete and his third year at Oregon had not yet started.

The third year was more relaxed and less enjoyable. Merle attended seminars and spent a great deal of time working on his thesis, as it was the content of the third quarter seminar. A very terse ten pages turned into seventy. He continued to work with Harrison and attended seminars. He received a Ph.D. at the end of spring quarter 1965.

It seemed as if every college in the country was looking for math faculty that spring. Massive amounts of government research money had moved many teachers out of the classroom and had generated many Ph.D.'s. Massive cuts then moved the teachers back and faculty positions have been scarce ever since. However, Merle returned to Montana in the fall of 1965 where he taught until he retired in 1996.

Merle's has the following thoughts on his years of teaching. Mathematics is not a content subject, it has much more in common with the fine arts than it has with the conception most people (and unfortunately most teachers) have. It is concerned about what, why, when, and how a number should be calculated, but is unconcerned about the actual calculation (which used to be done by clerks, but now is done by computers).

Females have as much mathematical ability as males, but being more studious are less comfortable with the time lag in understanding. They take longer to overcome training as "clerks" than males and are significantly behind when they finally do. Mathematics (even arithmetic) is or has been useful to an extremely small percentage of the species. A basic understanding can make the world less mysterious, but otherwise mathematics is only useful when one understands its nature and often not even then.

Merle also believes that ability and diligence to work in math may have peaked in the early 70's. Many of today's students seem to believe that they know better than the professor does as to what should be taught to them. These conditions make teaching math very dif-

Announcing Fellowships for Doctoral and Post-Doctoral Study in Mathematics Education at The University of Montana

The National Science Foundation has awarded a \$10 million grant to a consortium of Universities, including The University of Montana, to regenerate leadership in teaching and research in mathematics, science and technology by establishing The Center for Learning and Teaching in the West. There are 10 such Centers funded nationwide. The Centers will encourage the development of new faculty and new materials to boost learning in kindergarten through 12th grade as well as prepare graduate students in areas of critical national need to eventually assume leadership roles.

The Center for Learning and Teaching in the West is a consortium of five universities collaborating with tribal colleges and public school systems in Montana, Colorado, and Oregon. The Center will bring the varied expertise of scientists, mathematicians, and educators to address current challenges in understanding and improving student learning and achievement in science and mathematics, from middle school through college. Work will include research and related activities, focused on studying and addressing the wide ranges of achievement observed among students in urban and rural settings. The Center will support research activities, a doctoral graduate curriculum, in-service professional development, and pre-service teacher preparation, much of it delivered through distance technology. The goal is to develop and support a new generation of educa-

tional leaders who will use their knowledge of mathematics, science, and pedagogy to improve teaching and learning.

The specific goals of the Center include: (1) increasing the number of qualified doctoral and post-doctoral level professionals with expertise in science and mathematics education; (2) increasing the number and quality of new teachers graduating with certification in these fields; (3) providing professional development to science and mathematics teachers in low-income and high minority schools in both inner cities and rural schools in the West; (4) investigating how distance learning can improve graduate education programs; and (5) enhancing the research infrastructure. Increasing science, mathematics and education faculty participation in research on teaching and learning is an overriding objective for this center. CLT West is a regional center serving the national science and mathematics education community. Other higher education partners working with MSU Bozeman and The U of M include Colorado State University, University of Northern Colorado, Portland State University and Fort Belknap Community College, MT. Other Center partners include rural school districts throughout Montana and in northern Colorado, and the Portland Public Schools.

For more information about the Center, or the Doctoral Fellowships, contact Dr. Libby Krussel, UM Director for CLT-W, at (406) 243-4818 or by e-mail at

2001-2002 Graduate Degree Recipients

Name	Degree	Date	Project Title	Advisors
Greg Cripe	Ph.D.	Spring 2002	<i>The Effect of Information on a Stochastic Fishery</i>	Dr. Kalachev
Scott Jones	MA	Spring 2002	<i>Operations on Graphs</i>	Dr. McNulty
John Gee	MA	Spring 2002	<i>Using Correlation Coefficients and Order Statistics to Estimate Sigma</i>	Dr. Gideon
Supawan Gai Lertsakrai	Ph.D.	Spring 2002	<i>Asymptotic Analysis of a Fast Reaction outside a Solid Sphere in a Creeping Flow</i>	Dr. Kalachev
James McGowan	MA	Spring 2002	<i>Orientability of Matroids</i>	Dr. McNulty
Kristina Pierce	MA	Fall 2001	<i>Penny for your Thoughts: Problem Solving Activities for High School Math Teachers</i>	Dr. Lott
Sheryl Schopfer	MA	Spring 2002	<i>A Study of a Reaction-Diffusion Equation</i>	Dr. Derrick
Huaiqing Sheng	Ph. D.	Spring 2002	<i>Estimation in Generalized Linear Models and Time</i>	Dr. Gideon

2002 – 2003 Mathematics Scholarship & Award Winners

Joseph Hashisaki Memorial Scholarships

*(for outstanding upper division
math majors, \$1500)*

Erin Emerson

Mac Johnson Family Endowment Scholarships

*(for students who have completed at least one
semester of calculus and shown exceptional talent
in mathematics, \$1000)*

Elliott Barcikowski,
Nicholas Miller,
Beverly Plumb,
Leanne Randles &
Grant Swicegood

N.J.Lennes Awards

*(cash prizes based on performance
on a competitive exam)*

(1st \$200) Daniel Wedul,
(2nd \$150) Cody Custis,
(3rd \$100) Lance Fisher

Undergraduate Teaching Scholars

*(works with a professor to improve a class,
\$1500/semester)*

Erin Emerson,
Nicholas Miller &
Grant Swicegood

Undergraduate Technical Scholar

*(work on computer tools for a class,
\$1250/semester)*

Jesse Neidigh

John A. Peterson

Mathematics Education Award

*(book award to outstanding senior
in mathematics education)*

Catherine DeGrandpre &
John N. Giovanini

Undergraduate Tutorial Scholars

*(assist students in a lower-level course,
\$1250/semester)*

Elliott Barcikowski,
Allison Jochim,
Erica Lane,
Beverly Plumb &
Leanne Randles

Graduate Student Distinguished Teaching Awards

*(\$500 awards to two
outstanding teaching assistants)*

Robert Barlow &
Scott Jones

Summer Graduate Research Scholarships

(\$1600 to \$3200)

Varougan Bedros,
Ya-Ling Hsu,
Deborah Sloan &
Travis Togo

Golden Teaching Assistant Scholarship

(\$1000)

Varougan Bedros,

Pi Mu Epsilon New Members

Robert Barlow,
Brian Fish,
Rosny Jurniati &
Nicholas Miller

University-wide & National

*Congratulations to math faculty who received merit/tenure/
promotion effective fall of 2001:*

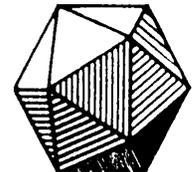
*Jon Graham (tenure and merit),
Leonid Kalachev (promotion to a full professor),
Libby Krussel (tenure)
Nenette Loftsgaarden (merit),
Johnny Lott (merit),
Karel Stroethoff (merit)*

We would also like to welcome our new faculty for Fall 2002:

*Adam Nyman (assistant professor, algebra)
Bharath Sriraman (assistant professor, math education)*



pme/MAA Math Club Corner



The Pi Mu Epsilon/Math Club at The University of Montana continues to meet on a weekly basis and enjoy a variety of activities. This academic year, we have enjoyed talks on a wide variety of mathematical subjects from a wide variety of people. Student presentations included talks by Young-A Choi, Annemarie Dahm, Diana Davey, Matt Graves, Tiffany Horsch, Jennifer Hudson, Nick Miller, Alice Nelson and John Spritzer. Other activities included a reading and discussion of the book *Flatland*, led by Nick Miller, and video viewings of *Outside In*, and *Not Knot*. We had a discussion of the different options available in the mathematics de-

gree at UM. Professor Jim Hirstein gave a talk on the Fourth Dimension, and Professor George McRae gave a presentation on using the slide rule. Professor Libby Krussel gave a presentation on using manipulatives in teaching and learning mathematics, focusing on the use of algebra tiles in learning algebra and Mira™'s in learning about symmetry in geometry.

We are currently planning the schedule of our annual Movie Extravaganza of mathematical movies, to celebrate Math Awareness Month in April. We are planning to show *Fermat's Last Tango*, a musical about the proof of Fermat's last theorem, *October Sky*, a popular movie about a boy who

wants to be an astronaut, *Code Breaking: Spies*, about the use of mathematics in breaking codes, as well as the perennial favorite *Donald in Mathmagicland*. The showing will take place on Tuesday, April 16th from 11 - 4:30 pm in the new UC theater. As is our custom, we end each semester with a pizza party, and Math Club t-shirt sales.

πμΕ/MAA Math Club

President: John Spritzer
Vice President: Tiffany Horsch
Secretary Annemarie Dahm
Treasurer: Bev Plumb
Advisors: Libby Krussel &

The University of
Montana

Department of Mathematical Sciences (MMAI01)
Mathematics Building
Missoula, MT 59812-0864

NON-PROFIT ORG.
U.S. POSTAGE
PAID
MISSOULA, MT 59812

