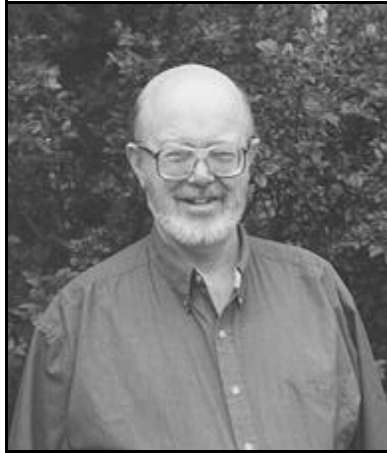# Department of Mathematical Sciences

Retiring Faculty

by Jim Hirstein

This year the department saw two retirements, Bill Derrick and Mary Jean Brod.

Bill received a Ph.D. from Indiana University in 1966. He taught mathematics at the University of Utah and Arizona State University before coming to The University of Montana as an Associate Professor in 1972. Bill was promoted to Professor in 1975. Throughout his career, Bill has been recognized as an excellent teacher and advisor. He served the Department as chair from 1979 to 1981 and again from 1987 to 1990.

In addition to his excellent teaching record, Bill contributed significantly to research in mathematics. He has written books, published articles, and conducted seminars in applied

Bill Derrick

mathematical modeling. He was a Fulbright Fellow in 1975 and an NSF Faculty Science Fellow in 1976-77. Six doctoral students finished under his direction. In 1999 he received the University's Distinguished Scholar Award. As a professor, a scholar, a leader, and finally as a senior resource, Bill has developed the talents of many students in the Department of Mathematical Sciences for over thirty years.

Mary Jean has been a member of the mathematics faculty since 1977. She received a master's degree in Mathematics Education from Stanford University in 1969. She has served as director, coordinator and teacher in the department's developmental mathematics program. She also taught in the Health Careers Opportunities Program, bringing Native American students to campus to encourage careers in health professions.

Mary Jean Brod

In addition to her excellent teaching record, Mary Jean has given untiring service to the university and department. She served as academic advisor to students as well as faculty advisor to the UM Student Mathematics Club. She has been a faculty affiliate to the local chapter of American Indian Science and Engineering Society (AISES). She has been a recruiter and given talks on women in mathematics and American Indians in mathematics. She also served the department on curriculum and evaluation committees and was elected to the Faculty Senate.

Winning Logo

by Mark Kayll

We have a winner! The Fall 2002 issue of this newsletter announced the department's logo contest, and we're excited to congratulate the winner, Saša Antonijevic, who submitted the entry below.

I risk explaining the obvious, but… the design stylizes Western Montana's border to form a mathematical thinker whose eye locates Missoula.

Of our various advertising outlets, perhaps the most important was the Internet. The department's web page reached designers as far away as India,

Denmark and Serbia.

Saša, from the former Yugoslav republic, holds a degree in economics and information systems. He programs computers for a Serbian bank but—since he likes creative jobs—dreams of becoming a professional graphic designer. Our contest completes a "hat trick" for Mr. Antonijevic, having won three logo contests over the past year. His kind wishes for the department read, "I hope that my logo will give a lot of luck and success for your department and that someone from this department in the future will win [the] Nobel prize for mathematics!"

With thanks to the Math Club, Saša's design now adorns T-shirts, available in the department office in short- and long-sleeve. Congratulations to Saša, and many thanks to everyone who submitted entries.

Notes from the Chair's Desk

It has been a banner year for the Department of Mathematical Sciences. We continue to offer mathematics classes to an audience as large as ever. Our faculty research shows a high level of productivity that brings talented visitors to our campus.

Suren Grigoryan (Kazan State University) spent most of the year in Missoula, working with Thomas Tonev on a joint US-Russia grant in analysis. Tom Dick (Oregon State University) was here for the entire academic year, working with Libby Krussel as a fellow in the Center for Learning and Teaching in the West. Two public school teachers, Deb Johnson (Highwood, MT) and Mark Lutz (Dayton, OH) came to help fill in the mathematics education classes for our faculty on grants. We were fortunate to have Greg Cripe (applied math, Montana) and Arturo Magidin (algebra, Berkeley) here as sabbatical replacements.

Several new grant awards were made to mathematics faculty. Adam Nyman received a University Research Grant to study non-commutative vector bundles. Brian Steele will be working on a USDA grant to study statistical methods for the forest service. Bob McKelvey received an NSF grant supporting the study of marine fisheries. Dave Patterson's wolf recovery study at Yellowstone Park was extended. Coupled with continuing projects, the department has the highest level of external activity in recent years.

Our Colloquium Series started in September with an excellent group of speakers from the Big Sky Conference on Discrete Mathematics, and ended in May with spectacular mathematical art and a presentation by Helaman and Claire Ferguson (see www.helasculpt.com/). Certainly, our students and faculty continue to have many opportunities to expand their mathematical knowledge. What a wonderful environment!

James Hirstein

Faculty:

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

Johnathan Bardsley, *Applied Mathematics*
Rick Billstein, *Mathematics Education*
Johnathan Bardsley, *Applied Mathematics*
Lauren Fern, *Lecturer*
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*
Matt Roscoe, *Lecturer*
Greg St. George, *Analysis*
Regina Souza, *Lecturer*
Bharath Sriraman, *Mathematics Education*
Brian Steele, *Statistics*
Karel Stroethoff, *Analysis*
Thomas Tonev, *Analysis*
Carol Ulsafer, *Lecturer*
Nikolaus Vonessen, *Algebra*

Faculty Emeriti :

William Ballard	Merle Manis
Mary Jean Brod	Robert McKelvey
Charles Bryan	William Myers
Bill Derrick	Howard Reinhardt
Stanley Grossman	George Votruba
Gloria Hewitt	Keith Yale
Don Loftsgaarden	

Visiting Faculty

by Libby Krussel

Tom Dick, Professor of mathematics and mathematics education at Oregon State University, spent his sabbatical leave for the academic year 2002-2003 at The University of Montana in the Department of Mathematical Sciences. He was invited to be a Faculty Fellow with the Center for Learning and Teaching in the West (CLTW) an NSF-funded Center under the direction (at UM) of Professor Libby Krussel. During his visit, Tom developed and taught a CLTW on-line doctoral course, Models of Technology Use in Mathematics and Science Education. This course was offered in Spring 2003 and was taken by CLTW doctoral students (and others) in mathematics, science and education across the five Western campuses participating in CLTW.

Tom also co-taught MATH 500, Current Mathematics Curricula, with Libby Krussel in Fall '02. He and Libby have spent time collaborating on some mathematics education research on the nature and uses of discourse in the mathematics classroom. They were joined by their colleague, Professor Linda Simonsen, MSU—Bozeman, who is interested in applying the discourse framework to distance learning in particular.

Tom was also an active participant in the Mathematics Education Seminar this year, and also used his experience with EXCEL workshops to assist graduate student Debbie Sloan start up an EXCEL workshop at UM – a calculus enrichment workshop for MATH 152 (Calculus I) students. Tom returned to Oregon State University in mid-June.

To contact the Department:

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Phone: 406-243-5311
Website: www.umt.edu/math

Please send address changes to
Linda Azure, Secretary,
at the address above or e-mail
lazure@selway.umt.edu.

Sabbatical in Glacier

by David Patterson

I had the opportunity to spend my sabbatical in 2001-02 in Glacier National Park under the *Sabbatical in the Parks* Program. This new program encourages research of interest to the National Park Service by providing housing, office space, and administrative support to university faculty conducting research in the parks. I'm a statistician, and I worked with Kate Kendall, a U.S. Geologic Survey bear biologist based in West Glacier on analyzing data from a recent effort to estimate the number of grizzly bears in the Park using DNA hair trapping. This involved obtaining hair samples from bears by setting up a grid of "hair traps" across a large area. A hair trap consists of barbed wire wrapped into a corral around a few trees with a very strong liquid scent attractant placed in the middle. When a bear comes to investigate, it leaves some hair snagged on the barbed wire and the DNA can be analyzed to identify the individual bear and its gender. Hair is collected at regular intervals, and mark-recapture modeling can be used to estimate the total number of bears in the population. The modeling is complicated by the difficulties of assessing the assumptions of the various models and the errors inherent in DNA analysis. While we are completing the analysis, Kate is planning a much larger hair-trapping study to estimate the number of bears in the whole Northern Continental Divide Ecosystem. More information on the project can be found at http://nrmsc.usgs.gov/research/conservation_bears.htm.

I also had time to work on other research in a very quiet atmosphere. The greatest part of the program, however, was getting to spend a year living in West Glacier with my wife, Margie, and our children, Alec and Gilly, who attended the local 45-student elementary school. As in many small towns, school events were community events, so everyone showed up for the Christmas program, plays, etc.

The winter of 2001-02 was a particularly heavy snow year in West Glacier, which made the experience (and the skiing) even better. Since the Going-to-the-Sun road was not completely cleared until July 1, there were about 6 weeks in May and June where only bicycles were allowed above Avalanche Creek. The bike rides were probably the most memorable part of our time there.

We've been back in Missoula for almost a year now, but our connection to Glacier remains strong and we hope to spend more time there in the future. I thank the Park Service for providing me such a great opportunity.

Lake McDonald in winter

Alumni News

The department was saddened to learn of the passing of **Paula Joy (Beers) Pollock**, who died in April in Duluth, Minnesota. She was 59 and had fought inflammatory breast cancer for five and a half years. Paula entered the department as a graduate student in 1970. Her survivors include her husband, James, whom she married in Pattee Canyon State Park in July, 1971. She taught math at the University of Minnesota-Duluth and more recently was working in information technology support at the same university.

Amy Dickman (B.A. 1993) taught high-school math for five years, then moved to Denver to teach Microsoft applications for a computer training center. She is now employed by an investment counseling firm in downtown Denver.

Writes Jane Hansen of her husband **Daniel Hansen** (Ph.D. 1971), "Sadly, Dan passed away March 18, 2001. He <u>loved</u> his five years at the University of Montana. We made <u>wonderful</u> friends there from 1966-1971. Our daughter, Heather, was born in Missoula in 1970. Greetings to Don Loftsgaarden."

Congratulations are in order for **Nathan (Norm) Hoffman** (M.A.T. 1971, M.A. 1972, Ed.D. 1973) who was recently awarded an Australian government Centenary Medal for "service to society through mathematics". He passes on his regards to all, in particular to those who were around in the early 1970's.

Rod MacDonald of Helena, MT shared some thoughts from his brother **Torrence MacDonald** (B.A. 1938), also of Helena. Torrence has fond memories of his years in attendance at the university.

Lynn Sather (B.A. 1993) recently moved to Anaconda (from Libby) with her fiancé, Jack Housel, who works at the mill in Deer Lodge. Plans for the fall include tutoring.

Dick Wood (Ph.D. 1976) retired on 'one, two, three' (1/2/03) after teaching mathematics and computer science for thirty-one years at Seattle Pacific University.
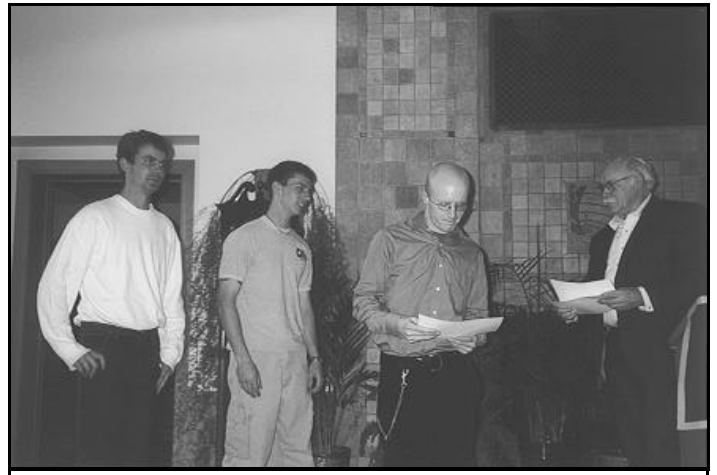
2003 Awards Ceremony

Lisa Marie Wagner (with Prof. George McRae); Joseph Hashisaki Memorial Scholarship

Charles Rinehart, Curtis Norman, Matt Graves (absent Vina Little Owl); Mac Johnson Family Endowment Scholarships

Grant Swicegood, Nick Miller, Tiffany Horsch (with Prof. Jim Hirstein); three of President's Senior Recognition Awardees

Pi Mu Epsilon new members

See next page for a complete listing of the 2003-04 awardees, including those absent from these photos.

2003 Graduate Degree Recipients

Name	Degree	Title	Advisor
Varoujan Bedros	Ph.D.	*An Exploratory Study of Undergraduate Students' Perceptions And Understandings of Indirect Proofs*	Dr. Krussel
Jiyan Du	M.A.	*Calibration Of Misclassification Probability Estimates For Estimating Classifier Error Rates*	Dr. Steele
Matt Edmonds	M.A.	*Oriented Flow of Rank 3 Matroids*	Dr. McNulty
Yaling Hsu	M.A.	*An Investigation of the Factors Affecting Middle School Mathematics Students' Ability to Solve Unfamiliar Problems Involving Familiar Mathematics Concepts*	Dr. Krussel
Hillary VanSpronsen	M.A.	*Grid Graphs and Maximum Leaf Spanning Trees*	Dr. McNulty

2003 – 2004 Mathematics Scholarship & Award Winners

Joseph Hashisaki Memorial Scholarship
(*for outstanding upper division math majors, $1500*)

Lisa Marie Wagner

Mac Johnson Family Endowment Scholarships
(*for students who have completed at least one semester of calculus and shown exceptional talent in mathematics, $1000*)

Clarence Matthew Graves
Vina Little Owl
Curtis Norman
Charles Rinehart

N.J.Lennes Awards
(*cash prizes based on performance on a competitive exam*)

Daniel Wedul (1st)
Michael Knight & Erica Lane (2nd)
David Yao (Honorable Mention)

Undergraduate Teaching Scholars
(*works with a professor to improve a class, $1500/semester*)

Erin Emerson
Rosny Jurniati
Erica Lane

Undergraduate Technical Scholar
(*work on computer tools for a class, $1250/semester*)

Michael Mumm

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

Clarence Matthew Graves
Nathan M. Lackie
Curtis Norman
Charles Rinehart
Lisa Marie Wagner

John A. Peterson Mathematics Education Award
(*book award to outstanding senior in mathematics education*)

Leanne Randles
Grant Swicegood

Graduate Student Distinguished Teaching Awards
($500 *awards to two outstanding teaching assistants*)

Lucas Casady
Hillary VanSpronsen

Summer Graduate Research Scholarships
(*$1600 to $3200*)

Chris Clouse
Katharine Gray
Jane Wilson

Golden Teaching Assistant Scholarship
(*$1000*)

Hillary VanSpronsen

Pi Mu Epsilon New Members

Lucas Casady
Michael Coons
Nova Finley
Kira Heater
Nora Leetch
Andrew McDonald
Ann Suter
Jonathan Comes
Christopher Corbin
Clarence Matthew Graves
Erica Lane
Arturo Magidin
Bharath Sriraman
Lisa Wagner
Gail Yeomans

President's Senior Recognition Awards
Elliott Barcikowski (Applied Analysis)
Tiffany Horsch (Combinatorics & Optimization)
Nicholas Miller (Pure Mathematics)
Beverly Plumb (Pi Mu Epsilon)
Carl Saunders (Statistics)
Grant Swicegood (Mathematics Education)

Outstanding Speakers for Big Sky

by Mark Kayll

Once again the Big Sky Conference on Discrete Mathematics has landed two invited speakers of international renown. Bill Cook of Georgia Tech is an expert on combinatorial optimization (e.g. the Traveling Salesrep Problem), while Bojan Mohar of the University of Ljubljana (Slovenia) specializes in graph theory, especially of the topological variety (e.g. embedding graphs on surfaces).

Professors Cook and Mohar will deliver the principal lectures during this year's Big Sky Conference from 11–13 September. Like magnets, these outstanding discrete mathematicians will attract researchers from all over the region to participate in the meeting.

Now in its ninth year, the event's sponsors include the National Science Foundation, EPSCoR, the Institute of Combinatorics and its Applications, the UM President's Office, and of course, the Department of Mathematical Sciences.

The organizers hope to see you at the conference in September.

For more information on the meeting, see www.math.umt.edu/bigsky/; the speakers' pages may also be of interest: www.isye.gatech.edu/~wcook/ and www.fmf.uni-lj.si/~mohar/.

2003 Honor Roll of Donors

Sharon Bakke
William & Lee M. Ballard
Mary Jean & Rodney Brod
Frank & Myrna Gilfeather
Mary Hashisaki
Gloria C. Hewitt
Gregory & Sydney Hulla
Stephen Koepele
Fat C. Lam
Torrence MacDonald
Sean O'Halloran
Betty B. Remington
Sister Adele M. Rothan
David M. Sherry
Greg St. George
Catherine & Jeffery Stewart
Elena & Thomas Tonev
Martha & Keith Yale

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