The University of Montana

Department of Mathematical Sciences

A Newsletter for Alumni, Faculty, Staff, and Friends **Spring 2004**

Birthday Celebration

by Jim Hirstein

Anyone who has had anything to do with mathematics at the University of Montana during the last 75 years is familiar with our home on the oval. Since this past year marked the 100th anniversary of the building's dedication, we paid tribute with a party to celebrate "A century of service."

Dedicated in 1903 as Women's Hall, the dormitory housed 72 women at the young University of Montana. The fourth campus building, it was designed by A.J. Gibson, the era's predominant Missoula architect. The marvelous structure had electricity and indoor plumbing, a spacious parlor and music room, a dining room, and an excellent location.

One 1903 resident of the new Women's Hall was Cynthia Elizabeth Reilly, the university's first mathematics teacher. Miss Reilly was one of the university's five original faculty members. She taught in the Mathematics Department until 1910, when she returned home to Ohio.

In the 1920s, Women's Hall was renovated into a classroom building and renamed Craig Hall, after the university's first president. The building has been home to mathematics since that time. We shared it with the Physics Department for a while; when they moved to the Science Complex in the 1950's, our home was renamed the Mathematics Building. (The name Craig Hall had been assigned to another campus dormitory.)

Women's Hall in 1903

(Continued on page 2: Birthday)

Lott Receives Dennison Faculty Award

by Rick Billstein

Longtime department member Johnny Lott received the university's George and Jane Dennison Faculty Award for 2003-04. Johnny is a perfect match for this award based on the significant recognition he has brought to the University of Montana at the state, regional, national, and international levels. Dr. Lott was hired as an Assistant Professor in 1974 and promoted to Associate Professor in 1978 and Full Professor in 1983. Over the years, he received many merit awards, and in 1996 was nominated for the Distinguished Researcher Award.

For the past two years, Johnny has been the most important and most recognized person in mathematics education in the country because he is serving as President of the National Council of Teachers of Mathematics (NCTM). He served one year as President-elect, is serving two years as President, and will serve one year as Past-president. Being NCTM President is a full-time job that forces him to be on the road two-three weeks of every month.

Johnny Lott

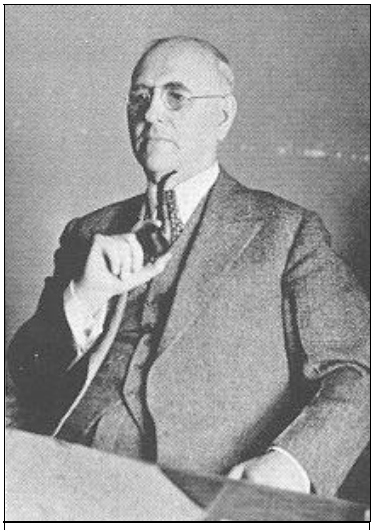
To understand the enormity of the job, one should understand how big NCTM really is. Founded in 1920, NCTM is the world's largest mathematics education organization, with more than 100,000 members and 250 affiliates throughout the United States and Canada. NCTM is a public voice of mathematics education, providing vision, leadership, and professional development to support teachers in ensuring mathematics learning of the highest quality for all students. NCTM publishes four professional journals: *Teaching Children Mathematics, Mathematics Teaching in the Middle School, Mathematics Teacher,* and *Journal for Research in Mathematics Education*. Other

(Continued on page 4: Lott)

Notes from the Chair's Desk

As chair of the Department of Mathematical Sciences, I follow a distinguished group of leaders who have left a rich tradition of mathematics learning at the University of Montana. None of our former chairs is more instantly recognizable than N.J. Lennes.

Dr. Lennes earned his Ph.D. in



N.J. Lennes

Mathematics from the University of Chicago in 1907, under the direction of E.H. Moore. He joined the mathematics faculty of the University of Montana in 1913. In 1944, he retired, having spent most of his tenure here chairing the department.

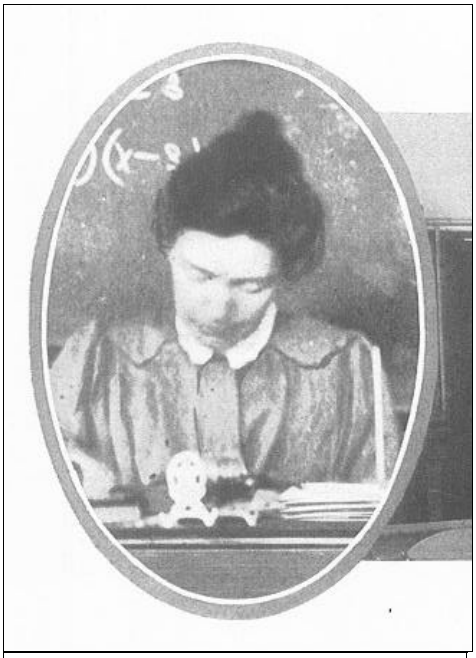
Lennes was a name known to many school mathematics students all around the country because he wrote textbooks. And he wrote them at all levels. Elementary texts, practice books, and test books spanned all the grade school years. He authored books for high school algebra, geometry, trigonometry, and business mathematics. At the college level, he wrote texts for college algebra, analytic geometry, calculus, and mathematics survey courses for students in other disciplines. One measure of the broad success of Dr. Lennes' work is that a computer search of old book providers results in several hundred titles.

Back in the 1950's, our department established an annual mathematics competition for undergraduate students and named it the Lennes Exam. Student papers are scored and ranked by department faculty members, and the winners receive cash prizes. These prizes are generated by a modest fund whose annual interest provides about three awards in the $100 to $200 range. In the past, many of our contributors have specifically mentioned the Lennes fund with their gifts, but the department has not recently made a push in that direction. However, in looking back over the department's history to celebrate the 100th anniversary of the math building (see the accompanying article), Dr. Lennes' name arose frequently. We've certainly had nearly 50 years of Lennes Exams (I cannot find any record of the first one, but retired Professors Bill Ballard and Howard Reinhardt agree that it was already going when they arrived in 1957). So if any of our readers have any recollections of Lennes classes or Lennes books, or if you took the Lennes Exam, we'd love to hear your stories.

James Hirstein

(Birthday: Continued from page 1)

Our building is simple but efficient. We have room for twenty faculty offices, our administrative offices, the math library, the undergraduate study room, the Mathematics Learning Center, six classrooms, and two computer labs. We've lost the big porches of the original Gibson design, and the floor plan was modified to convert dorm rooms to classrooms. We've had fresh paint and new carpeting a couple of times, and electronic technology is now available throughout the building. But the structure has not changed much at all. Anyone who remembers climbing to the third floor for an intriguing math class on a beautiful Montana afternoon would feel right at home here today.



An early photo of Cynthia E. Reilly

Faculty:

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

Johnathan Bardsley, *Applied Mathematics*
Rick Billstein, *Mathematics Education*
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 :

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

Introducing a new faculty member: Jonathan Bardsley, Assistant Professor

by Leonid Kalachev

John Bardsley has recently joined the department's Applied Mathematics group. Hired after an extensive search, he began official duties in September 2003. Immediately after his arrival, he got involved in the group's activities. He started working with a graduate student (Mohammad Khan), began teaching (Ordinary Differential Equations during the fall), and contributed to the seminar. Now he is

John Bardsley

teaching Partial Differential Equations, and this spring he also revived our Numerical Analysis course. Due to its practical applicability, this is a useful course not only for mathematics majors but also for students from departments requiring facility with scientific computation. John's areas of expertise include Computational and Applied Mathematics, Inverse and Ill-Posed Problems, Computational Electromagnetics, and Atmospheric Optics.

A native Montanan, John was born in Missoula in 1973. In 1996, he took a Bachelor's degree from the Mathematical Sciences Department at Montana Tech in Butte. He earned two Master's degrees in mathematics: one from Montana State University and one from the University of Oregon (in 1998 and 1999, respectively). For his Ph.D., he worked on *Constrained Optimization Techniques for Image Reconstruction* under Dr. Curtis Vogel at MSU. During the previous academic year, John was a Post-doctoral Fellow at the Statistical and Applied Mathematical Sciences Institute and at the Center for Research in Scientific Computation (North Carolina State University). During this period, John authored a number of scholarly publications and gave many presentations on his research at conferences and workshops.

John's wife, Jennifer, also a native Montanan, is an artist. They have two lovely kids, Alex, 7, and Ellie, 4. They all enjoy Missoula and over the summer hope to build a new house for their family.

To contact the Department:

Dept. of Mathematical Sciences
The University of Montana
Missoula, MT 59812-0864
Phone: 406-243-5311
Website: www.umt.edu/math

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

Alumni News

- Welcome back to Missoula to **Robert Baker** (B.A. 1986; M.A. 1996). Since graduation, Bob's travels have taken him all over the globe. After working at 'ReGnu Tutoring' and the Poverello Center in Missoula, he left for Alaska, where he became the mathematics department at U of A's Southeast-Ketchikan Campus. While there, he joined the People-to-People Ambassador Tour's math-education delegation to China. This led in turn to a Japan visit and a U.S./Russian conference in St. Petersburg, where he had a paper translated into Russian. After five successful years in Ketchikan, Bob moved to Pendleton, Oregon, where he taught at Blue Mountain Community College. Now back at UM, Bob is working towards a second master's degree, this time in history. Word on the street is that 'Director Baker' is once again involved organizing a staged reading with mathematical content, namely the play *Proof*. Watch for notices this spring.
- Good news from **Annie Qu** (M.A. 1992). Annie received a National Science Foundation CAREER award for 2004-2009. The grant will support her research and education activities on semiparametric and nonparametric models for correlated data. The CAREER awards represent the highest distinction that the NSF bestows on junior researchers. Congratulations, Annie!
- The department was saddened to learn of the passing of **DorAnn Kasube,** who died on March 15. She taught computer science at Bradley University in Peoria, Illinois for 20 years, last teaching on 12 March. She is survived, among others, by her husband, **Herb Kasube** (Ph.D. 1979), who has been teaching mathematics at Bradley since they left UM. From Herb: "DorAnn loved our time in Missoula and felt very close to many people there." The department shares his sorrow.

(Lott: Continued from page 1)
publications include the monthly member newsletter, the *NCTM News Bulletin*, and more than 200 educational books, videos, and other materials. NCTM's *Principles and Standards for School Mathematics ("Standards", 2000)* provides guidelines for excellence in mathematics education. The Council holds an annual meeting and several regional conferences each year, at which mathematics teachers and others interested in mathematics education can attend lectures, panel discussions and workshops, and view exhibits of the latest mathematics education materials and innovations. This meeting typically draws over 16,000 attendees each year, and Johnny delivers the keynote address and several other talks.

In representing the interests of its members in the public issues debate, NCTM is dedicated to ongoing dialogue and constructive discussion with all stakeholders about what is best for our nation's students. Johnny is constantly called upon to interact with politicians in Washington, DC, and these politicians are aware of the NCTM's importance. With Johnny as NCTM President, the University of Montana has become the NCTM's "West Wing", where many national decisions are made.

Johnny reached the country's top mathematics education position because of his national service. He was elected to the NCTM Board of Directors and then became heavily involved in the Council's leadership. He chaired the editorial panels for the publications *Student Math Notes* and *Teaching Children Mathematics*, each reaching over 50,000 readers. When NCTM decided to introduce a new publication to promote discussion among its members, Johnny was asked to be the editor of the *Mathematics Education Dialogues (1999).* This new publication is now a part of NCTM and boasts over 100,000 readers. Gail Burrill, of Michigan State University, and Johnny served together as directors for the *Figure This* project. This was a national enterprise to promote mathematics awareness. They produced bulletin boards, posters, and television ads for use throughout the country. This program, along with the website that still exists through NCTM, has had national implications, especially for the many parents that use the site.

When NCTM published its *Standards*, it needed accompanying materials to show how these standards should be implemented. Again, NCTM went to Johnny and asked that he serve as editor for the seven books of the high school series *Navigations.* He accepted this challenge and will have the last of the books completed by April 2004; he co-authored one of the books.

In the mid 1980's, Johnny with others from the University of Washington and Montana State University received funding from the Exxon Corporation to study and define *integrated mathematics* since this had never been done. After this project was complete, Johnny devoted practically all his time and research efforts to ensure the success of the *Systemic Initiative for Montana Mathematics and Science* (SIMMS). Johnny co-directed this $10 million project. It involved designing a new 9-12 integrated mathematics curriculum that made heavy use of technology. The result is used throughout the nation and represented a first attempt to design an integrated mathematics program. This program was watched carefully by people all over the United States and has had tremendous impact on the direction of secondary mathematics. Johnny later received an additional $1 million to complete curriculum development for the project. He was also instrumental in obtaining funding for *Six Through Eight Mathematics* (STEM). This $3 million project developed a standards-based middle grades mathematics curriculum that is recognized throughout the country and indeed internationally. As judged by the American Association for the Advancement of Science (AAAS), it is one of only four satisfactory middle-school curricula. Johnny continues to serve as an Advisory Board member.

Johnny has co-authored many books involving mathematics education and computer education. In evaluating Johnny's performance, Glenn Allinger, an MSU mathematics professor, made the following observation.

> *The textbook Mathematics for Elementary School Teachers: A Problem Solving Approach, co-authored with Billstein and Libeskind, has become a classic. It is the most widely used and respected text of this type in the country.*

This text, first published in 1980 and now in its eighth edition (2003), has continued to be recognized nationally and to be the bestseller in its market. There are very few mathematics educators in this continent who are not aware of the volume or have not used it. It is continually revised to update the latest movements in mathematics education.

Johnny has published articles on a variety of subjects in too many national journals to list. He writes a regular column in the *News Bulletin* that is sent to all NCTM members. For the SIMMS Integrated Mathematics Module "Aids: The Preventable Epidemic", Johnny was presented the Governor's Award for AIDS Education

At the graduate level, Johnny was instrumental in the adoption of a new doctoral emphasis in Mathematics Education at UM. His work brought national attention to the new campus program. He directed its first PhD student and served on the dissertation committee for the second.

Again at the national level, Johnny is a member of the National Collegiate Athletic Association (NCAA) Core Curriculum Committee. On the international scene, in 1984 Johnny served as an organizer for the Fifth International Congress on Mathematical Education in Adelaide, Australia, and in 1989 he played a similar role for this international meeting in Budapest, Hungary.

Professor Lott has been recognized as a national leader for many years, but the last ten years have brought this to a peak. It would be hard to imagine anyone at the University of Montana more deserving of the Dennison Faculty Award than Johnny Lott.

2003 Big Sky Conference

by Mark Kayll and Jenny McNulty

The Big Sky Conference on Discrete Mathematics was held at the University of Montana from 11--13 September 2003. Participants, including students and faculty from across North America, travelled 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.

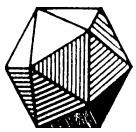
Three lectures were given by the two invited speakers, William Cook and Bojan Mohar. Dr. Cook is a professor in the Industrial and Systems Engineering Department at Georgia Institute of Technology, while Dr. Mohar is a professor in the Department of Mathematics at the University of Ljubljana (Slovenia). One highlight of these lectures was the Public Lecture by Cook on *The Traveling Salesman Problem and Optimization on a Grand Scale*. Cook began his lecture by enumerating various optimization problems of enormous size and complexity that arise in areas from genome sequencing to VLSI design. He discussed the challenges in working with large-scale models by considering the well-known traveling salesman problem (TSP), which asks for the cheapest way to visit a collection of cities and return to the starting point. He covered the history and applications of the TSP and the methods used to attack large instances. Along the way, he discussed the interplay of modern applied mathematics and increasingly more powerful computing platforms, including computational grids and distributed web-computing. In addition, both Cook and Mohar gave colloquia on their research to the conference participants and local scientific community.

The contributed talks were divided into five sessions spread over the three days of the conference. There were twenty-two talks in all, on topics including number theory, algorithmic graph theory, combinatorial algebra, knot theory, 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.

The first day's activities were designed to encourage student participation. In addition to the student conference attendees, students from Carroll College, Gonzaga University, and the University of Montana attended the day's events. The morning opened with a session for contributed talks by undergraduates, while Cook's public lecture closed out the evening. Preceding the last event, students gathered for a breakout session, followed by a pizza dinner. This was an opportunity for students to talk to other students from various schools and have their questions answered about summer research programs, internships, graduate school, GREs, and life/classes at other schools. The variety of student activities offered 'something for everyone', from youngsters (who enjoyed taking a Montana TSP Challenge), to high school and undergraduate students, and through to graduate students, who benefited from the research talks.

The Big Sky Conference on Discrete Mathematics works on many levels to impact Discrete Mathematics in the Northwestern United States and Canada. Due to the geographical isolation of the region, it is crucial to have such a forum to discuss ideas and problems in the target disciplines, and thus to stimulate further research. Continuing on past successes, this year's conference again fulfilled this pressing need. The unique opportunities for students exposed them to research-level mathematics through traditional lectures and to student issues through the breakout session. Finally, the public lecture served the important function of demonstrating to students and the local community that mathematics and the sciences are dynamic, evolving fields that impact modern society in striking ways.

Math Club Corner



by Jenny McNulty

The Math Club (see http://www.math.umt.edu/mathclub/) consists of students interested in learning more about mathematics. The weekly seminar series recently included the presentations *GPS, PET and the Sextant* by Prof. Emeritus Keith Yale, *Math without Computations* by Prof. Leonid Kalachev, and *Why Math and Law?* by UM alum Matthew Hayhurst. During the spring semester, we also read and discussed two popular math books: *Zero: The Biography of a Dangerous Idea*, by Charles Seife and *In Code: A Mathematical Journey*, by Sarah Flannery with David Flannery (contributor). For International Week, we celebrated with a discussion of the "Mathematics of Other Cultures" and the enjoyment of some international food. In addition to the weekly seminar, the club sponsors several events. Our big event in the fall is a "Gambling Day" and in the spring is the "Math Film Festival" (see the separate article p. 6). These events are free and open to the public---alumni are always welcome.

We invite you to support the math club. We are assembling a list of alumni who are willing to speak to our undergraduate majors about careers, courses, and life. Also, we are always looking for weekly seminar speakers. If you're interested, please contact Jenny McNulty (faculty advisor) at 406-243-2473, McNulty@mso.umt.edu or by postal mail to the department.

April is Math Awareness Month

by Mark Kayll

The department plans its usual host of activities to support Math Awareness Month, whose theme this year is the *Mathematics of Networks.*

Kicking things off, the ever-popular Mathematics Film Festival will run in the UC Theater on 19 April. The Math Club promises lots of new titles for this edition. *Copenhagen*, the Tony Award-winning drama, features a fictionalized account of a 1941 meeting between Heisenberg, the German physicist, and his longtime friend Neils Bohr. *Six Degrees of Separation* plays off the plausible conjecture that the acquaintance graph with all people as vertices has diameter at most six. *The Importance of Mathematics* presents a lucid, dynamic lecture on the deep and important question of the relevance of mathematics to society, delivered by 1998 Field's medalist, Timothy Gowers. And *Funny Numbers* shares an evening with author and actor Steve Martin in conversation with mathematician Bob Osserman. These are just a few of the titles being considered for the festival.

The following week (28 April), the department's annual Awards Ceremony will take place in the Dell Brown Room at Turner Hall. We're excited to celebrate once again the achievements of our outstanding undergraduate and graduate students. Those at the 2003 ceremony may recall the unveiling of the department's new logo. If you're in the department around this time, stay alert for a related visual change to our building‘s entree way.

Finally, the Mathematical Sciences Colloquium Series will feature a talk on the mathematics of networks. Details are being finalized as this newsletter goes to press. Remember, we'd love to see you at any or all of these events.

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

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