Endowing success: Alum Evan Stewart’s gift helps department enhance key activities for students and faculty

One gift, multiple benefits.

That’s the impact an endowment recently established by K-State mathematics alumnus Evan Stewart will have on the Department of Mathematics for years to come.

Established through the Kansas State University Foundation, Stewart’s endowment for the enrichment of mathematics will help support undergraduate and graduate research, mathematical competitions, lectures and mathematics-related conferences on the K-State campus.

Stewart’s gift also includes funding for pilot programs in which instructors and students use iPads instead of desktop PCs.

After receiving his bachelor of science in mathematics in 1965, Stewart worked first in software development and later in information technology and information systems for eight different companies, including Shell Oil Company, Puritan-Bennett Corporation and Spin-Net. He recently retired as vice president and chief information officer for B/E Aerospace Inc.

Stewart has worked with global law firms to manage massive documents for tobacco litigation and litigation resulting from the Resolution Trust and savings and loan disasters. As the vice president and chief information officer for the Puritan-Bennett Corporation, now Nellcor Inc., he was responsible for the information system required to manufacture medical devices in the respiratory care field as well as equipment for hospitals.

He also found time to earn his master of business administration, with a focus on planning and control, from the University of Missouri at Kansas City. He describes his graduate degree as a mid-career endeavor.

In 2001 he joined B/E Aerospace, the world’s largest provider of commercial and business jet interiors, helping lead the company’s evolution through both acquisitions and organic growth.

In honor of his accomplishments, Stewart was recognized as the department’s 2010 Distinguished Alumnus and gave the address at the 2010 Friends of Mathematics Awards Banquet.

“I am curious: What did it take for me to be prepared to enter the real world 45 years ago, and what does it take to prepare you for the next 45 years? What is the same, what will be different, and how will all of us be prepared for the challenges?” he asked students at the banquet.

Louis Pigno, head of the Department of Mathematics, said Stewart attributes his accomplishments to a range of opportunities he’s had, including the preparation he received as a math student at K-State. Pigno said the Evan Stewart Endowment for the Enrichment of Mathematics would help fund a number of activities of the department’s I-Center, which has integrated focus on undergraduate, graduate and postdoctoral research.

Matching interests:

I-Center coordinates research opportunities for undergraduates, promotes graduate research and more

Getting undergraduates involved in research projects is a priority of the Department of Mathematics — just as it is for Kansas State University as a whole.

It’s why the department formalized this activity with the formation of the Center for Integration of Undergraduate and Graduate Research Center, more commonly called the I-Center.

The center was made possible through funding from the provost’s office, the College of Arts and Sciences and the department. Its purpose is to provide directed research experiences for undergraduate majors in a mathematics area of their choice.
Getting more students involved in undergraduate research is one of the ways K-State President Kirk Schulz believes the university can become a top 50 public research university by 2025.

The director of the I-Center plays matchmaker by keeping abreast of faculty research projects, and then pairing a student interested in doing research with a faculty mentor when a good match is found. The result has been an increase in the number of undergraduates involved in research.

The I-Center also promotes graduate research and hosts conferences, minicourses and extended visits from distinguished faculty from around the world. It conducts a freshman seminar, and offers a contest problem seminar class in the fall and a mathematical modeling seminar class in the spring.

“The center is host of our summer Research Experience for Undergraduates — or REU — program, and administers a dual doctorate agreement between K-State and the Universite de Paris Pierre et Marie Curie, or Paris VI,” said Virginia Naibo, associate professor and director of the center. “The center also awards some scholarship money to undergraduates working on mathematics research projects.”

To help with all this work, the center employs four postdoctoral fellows who serve for three-year terms. Because they have recently completed their doctorates, the postdocs serve as role models to the undergraduate and graduate students, postdoctoral fellows and faculty, all jointly working on advanced problems in applied math, differential equations, algebra, number theory, modern analysis, geometry or topology.

The I-Center’s first director was Professor David Auckly, who stepped down when he took a two-year term as associate director of the Mathematical Sciences Research Institute in Berkeley, Calif. Professor Marianne Korten succeeded Auckly, then Naibo took over when Korten became director of the department’s summer REU program.

Korten said the center provides students with many benefits.

“Undergraduates get to see the frontiers of mathematics, the areas where mathematics is evolving. Traditionally, students were not exposed to this until several years into graduate school when they began work on their dissertation,” she said. “This early exposure to research gets students excited about the possibility of going to graduate school.”

The center can already boast many important successes:

• Will Carlson and Assistant Professor Ivan Blank worked on the project “Strengths of Homogenized Composite Materials.” The work helped Carlson win a Goldwater Scholarship. He is currently in the graduate mathematics program at the University of Texas at Austin.

• Mike Reppert worked with Naibo on “Estimation of Electron-Phonon Coupling Parameters from Low-temperature Optical Spectra.” Reppert also won a Goldwater Scholarship, in part for this work, and is now attending MIT as a National Science Foundation graduate fellow.

• Nicole Wayant worked with Associate Professor Diego Maldonado on “Spatial-temporal Analysis of Satellite and Climatic Data for Predicting Malaria Frequency in Paraguay.” Wayant won second prize in the undergraduate research paper competition at the American Association of Geographers meeting. She also received K-State’s 2009 Presidential Award for Distinguished Undergraduate Student in Research.

• Alyson Deines, who worked with Auckly on “Parameter Estimation in a Pharmacokinetic Model” and Professor Todd Cochrane on “Generalizing the Lucas-Lehmer Primality Test,” won the Goldwater Scholarship and the Clare Boothe Luce Scholarship. She was named honorable mention for the Alice T. Schafer Prize, a national award that honors outstanding women in undergraduate mathematics. She also received K-State’s Presidential Award for Distinguished Undergraduate Student in Research. Deines went to graduate school at the University of Washington.

• Ashley Wheeler and Associate Professor Ricardo Castano-Bernard worked on the project “Hamiltonian vector fields on surfaces.” Wheeler went to graduate school at the University of Michigan.

• In the 2009-2010 school year, five undergraduates were involved in research projects sponsored by the center. This past academic year, 2010-2011, six undergraduates were involved in research projects.
A quantitative success: Q-Center helping students succeed in mathematics

Making learning count is what the Mathematics Department’s Center for Quantitative Education, or Q-Center, is all about.

The center, which opened in 2007 in the lower level of Cardwell Hall, is the formal home for numerous projects related to mathematics education conducted by the Department of Mathematics, some in collaboration with other departments.

Professor Andrew Bennett serves as the founding director of the center. Research and implementation are simultaneously under way at the Q-Center, which has introduced a variety of new instructional techniques to classrooms at K-State — techniques that are adding up to success.

One of the center’s major projects is increasing the number of students passing the College Algebra course without lowering classroom standards. One approach has been using an alternative classroom format — a studio — for students who learn better in a more interactive setting. The first studio class was run as an experimental course in fall 2006 while the initial idea of the center was being developed.

Currently about one-third of students taking College Algebra are enrolled in the studio sessions. Students in this format weekly attend one lecture, one recitation and one studio session, which replaces the second weekly lecture of the traditional class. The studio session takes place in two newly fashioned rooms on the first floor of Cardwell. These rooms have computers to accommodate around 60 students working in groups of three. Much of the studio classroom activity is done on the computer, as students work on problems with spreadsheets and graph-drawing applications.

“The content of Studio College Algebra is geared to provide students with practical problem-solving skills, rather than just practice with algebraic manipulation,” Bennett said. “For example, students may be given a real set of data and asked to analyze it or fit it to a curve. They can use the computer to plot the data and compare it to the graph of candidate functions, tweaking constants and exponents as needed to get a good fit.”

The Studio College Algebra format has been a measurable success. Over the past two years, three-quarters of students taking the class in this format earned a grade of C or better, compared to two-thirds of the students in the traditional format, Bennett said. Students from both versions of the class go on to perform equally well in Math 205, General Calculus and Linear Algebra, the most common course taken next in college mathematics. This result shows standards have not been compromised.

One thing that helps ensure uniformity in the level of the classes is that they share a permanent course coordinator. Rekha Natarajan was hired in 2007 specifically to be course coordinator for all sections of College Algebra, Math 100. Natarajan earned a master’s degree in mathematics at Arizona State University. She then earned a high school teaching certificate at K-State while serving as part-time instructor in the Math Department, and then taught full time at Junction City High School for four years. Natarajan is also involved in other research activities with the Q-Center and is concurrently working on her doctorate in mathematics at K-State, focusing on undergraduate mathematics education.

Currently serving as fellows of the Q-Center are Hien Nguyen and Carlos Castillo-Garsow, both postdocs. A number of graduate students participate in Q-Center activities, including Drew Cousino and Todd Moore. These researchers concentrate on two main activities: developing new instructional online tools for calculus and other subjects, and analyzing the massive amount of data provided by students’ use of these programs.

The Q-Center has developed an online homework system used in several courses, which gives students immediate feedback on the accuracy of their answers and allows them to correct mistakes and even re-do complete assignments before the deadline. Each response is recorded, and student performance on individual homework problems is correlated to their performance on related examination material. In selected classes, online instructional videos are also available and linked to the online homework.

To obtain more information about the way students learn, each semester the Q-Center conducts about 20 student interviews. One area of current research is the identification of various quantitative personality profiles in order to identify which types of students benefit most from a studio-style class. Other research topics include developing a Bayes net for measuring conceptual understanding and longitudinal studies to track how effectively students transfer their mathematical knowledge to courses in science and engineering. The Q-Center has also developed a new online mathematics placement test for incoming undergraduates. Data shows that the results of this test combined with ACT scores are substantially better at appropriately placing students than the ACT alone.

The Q-Center has been funded with grants from three primary sources. Currently, Bennett has two grants related to the Q-Center activities. Research on transfer of mathematical ideas is supported by a grant from the National Science Foundation, which is jointly held by the Department of Physics and the Department of Electrical and Computer Engineering. In addition, the Kansas Department of Education sponsors grants, held jointly with the College of Education and various school districts, that pay for summer workshops for elementary and middle school teachers.

As to what’s next for the Q-Center, Bennett says they still have more than 1 million student responses to math problems to analyze.
Summer undergraduate research program
a formula for success

It’s an equation for a successful summer: Take a national grant, add eager-to-learn students from across the country, match with dedicated faculty and staff, and then watch the positive results multiply.

That’s what has been happening for several summers through the Department of Mathematics’ Research Experience for Undergraduates program. Called REU for short, these programs support active research participation by undergraduate students in a variety of mathematical areas, all under the guidance of experienced mentors.

The Math Department’s most recent summer undergraduate programs have been made possible through a National Science Foundation REU grant to principal investigators Marianne Korten and David Yetter for their program, Summer Undergraduate Mathematics Research (SUMaR) at K-State.

The primary goal of SUMaR at K-State is providing students from a variety of other undergraduate institutions — particularly from community colleges serving high percentages of underrepresented students — with a research experience that is similar to the one that the department’s own research oriented undergraduates have during their last two years at K-State.

Yetter was the lead mentor for SUMaR 2010, which focused on problems in cryptology. The faculty mentoring team also included Korten, Gabriel Nagy, Charles Moore and Dan Volok, as well as postdoctoral fellow Adrian Jenkins. Graduate students Bryan Bischof and Olena Ostapyuk also provided enrichment lectures.

This summer and in summer 2012, the focus of SUMaR at K-State is on harmonic analysis and its applications, all under the lead mentorship of Moore in 2011 and Virginia Naibo in 2012. Korten, in addition to mentoring, recruits the student participants, while Nagy is the troubleshooter, acting as a common resource for all undergraduate research teams.

The Math REU is the marquee summer program of the department’s Center for the Integration of Undergraduate, Graduate, and Postdoctoral Research, or I-Center. The center employs postdoctoral fellows who are engaged in mentoring and teaching activities, and faculty to run a freshman seminar, a Putnam Examination preparation class and a math subject GRE-prepping workshop in the fall. In the spring the center offers a mathematical modeling seminar and a course in digital image processing. Center faculty also prepare K-State students for the Goldwater Scholarship competition. Of the 64 K-State students who have earned Goldwater Scholarships to date, 27 were math majors.

The I-Center’s first REU, Brainstorming and Barnstorming, which was directed by David Auckly and focused on the mathematics of aviation, drew undergraduates from all over the nation. Philip Jameson Graber, while a student at Washington and Lee University, won a Goldwater Scholarship for the research he did at the REU under the direction of K-State’s Moore. Brainstorming and Barnstorming also resulted in six published papers, all appearing in reputable research journals.

SUMaR at K-State is also providing participants with valuable research experiences and similar opportunities for publication.

“Addressing national priorities, directed research by our I-Center team should supply SUMaR participants with the impetus to continue on to graduate work in a science or technology discipline,” Korten said. “Indeed, two of our current graduate students, Bryan Bischof and Eric Bunch, decided to enroll in our graduate program after participating in an I-Center REU.”

For more information about the I-Center’s REU program, contact Korten at 785-532-0567 or marianne@math.ksu.edu.

New faculty member receives Artin Junior Prize

One of the newest members of the Department of Mathematics faculty has gotten off to an award-winning start. Hrant Hakobyan, an assistant professor who joined K-State in fall 2010, received the 2010 Emil Artin Junior Prize in Mathematics.


The Emil Artin Junior Prize in Mathematics includes a $1,000 cash award. Since 2001 the prize has been presented annually to a student or former student of an Armenian university under the age of 35 for outstanding contributions to algebra, geometry, topology and number theory — fields to which Artin made major contributions.

Hakobyan graduated with honors with a bachelor’s in mathematics from Yerevan State University, Yerevan, Armenia. He earned his doctorate in mathematics from State University of New York at Stony Brook.
One of the premier mathematics research institutes in the world is benefiting from the services of a K-State Department of Mathematics faculty member. Professor Dave Auckly has been on leave from the department since August 2009 to serve as the associate director of the Mathematical Sciences Research Institute in Berkeley, Calif.

More than 2,000 mathematicians visit this institute each year, participating in one of its distinguished programs. A regular program at the institute lasts for one semester. Typically two regular programs are hosted at a time. These programs are advertised two or three years in advance, so faculty can arrange for leave to attend.

“The institute becomes the best place on the planet to develop new results in the areas represented by the current programs,” Auckly said. “Most of the leading experts in a specific program area visit the institute during the program. In fact, every Fields Medalist since 1982 — the year the institute opened — has spent time at the institute.

“While the topics of these two programs are distinct, they are close enough that interaction and collaboration is possible between the researchers participating in the two different programs,” Auckly said.

In addition to the two regular programs, the institute accepts a very limited number of members for extended visits in what is called the Complimentary Program. The institute also hosts a number of three- to five-day workshops.

Auckly has been in charge of education, diversity and outreach activities at the institute. He has organized approximately five education-based workshops per year. He also has responsibility for the institute’s math circles in the Bay area and its National Association of Math Circles.

A math circle is a group of people who get together to enjoy mathematics outside of school, usually with the input of one or more professional mathematicians. When Auckly joined the institute, 20 math circles were registered with the institute’s National Association of Math Circles. Today, more than 100 circles are registered. The association provides training workshops, lesson plans, problems and other resources including a grant program to help new and expanding circles. Visit its webpage, mathcircles.org.

Auckly said to watch for the Circle on the Road workshop in Washington, D.C., this spring, as well as the Spring Opportunities workshop and the Critical Issues in Math Education workshop at the institute this spring.

Even though he’s been away from K-State for a couple of years, Auckly’s had plenty of Wildcat company. Many current and former members of the K-State Mathematics Department have been to the institute over the past two years: Ilia Zharkov was part of the Tropical Geometry program in fall 2009; Natalia Rojkovskaia was part of the Complimentary Program in fall 2009; and Ray Treinen was part of the Free Boundary Program in spring 2011. Other visitors have included Xuan Hien Nguyen, Lev Kapitanski, Igor Rodnianski, Louis Pigno, Yan Soibelman, Julie Bergner, Stefano Vidussi, Gerald Hoehn, Ik Jae Lee, Olena Ostapyuk, Alyson Deines, Suresh Srinivasa Murthy and Nguyen Si Hoang. Auckly said he’s happy to see friends and invites you to look him up when you’re in the Bay area.

While Auckly has not had much time to pursue mathematical research during his stay at the institute, he’s still working on a number of problems in geometry and mathematical physics. He recently initiated the study of exceptional symmetries. As an example, the knot in Figure 1 has no apparent symmetries (one can prove that it has no symmetries.) It is not surprising that most manifolds obtained by surgery on it have no symmetries, either. There are, however, some exceptions. When one performs -2 surgery on this knot, the result is the manifold depicted in Figure 2. This has three non-trivial order two symmetries.

Auckly said he and his family are enjoying their time in California. Lynden is now 4 and John is 7. They have been going camping and enjoying the outdoors with their father, including paddling on the Bay in kayaks and dragon boats, and sailing. When he has time, Auckly has done some climbing, including Devil’s Tower last summer, and most recently, Lost Arrow Spire in Yosemite.

Home away from home:
Auckly on loan to the Mathematical Sciences Research Institute

Professor Dave Auckly

Figure 1

Figure 2
National Science Foundation grants recognize K-State as center for mirror symmetry, tropical geometry

The National Science Foundation is recognizing the Department of Mathematics as a regional leader in some growing mathematical fields with the recent awarding of Focused Research Grants to faculty researchers.

A Focused Research Grant allows groups of researchers to respond to recognized scientific needs of pressing importance, or to prepare the ground for anticipated mathematical developments. These grants also include generous funding for graduate students, which is important at K-State because of reduced financial support from the state over the last several years.

The first Focused Research Grant was awarded to the faculty team of Ricardo Castano-Bernard, Yan Soibelman and Ilia Zharkov for joint research in mirror symmetry and tropical geometry with counterparts at the University of Miami and the University of California at San Diego.

The second Focused Research Grant was awarded to Victor Turchin for collaborative research on the calculus of functors and the theory of operads with mathematicians at the University of Virginia, University of Georgia, Union College and the University of Notre Dame.

Tropical geometry, over the past decade, has significantly impacted three areas of mathematics: enumerative geometry, statistical physics and mirror symmetry. In addition to physics and computer science, applications of tropical geometry can now be found in mathematical biology. Mirror symmetry, originally a tool of particle physicists, has in turn influenced various aspects of mathematics, including algebraic geometry, symplectic geometry and number theory.

“These National Science Foundation awards confirm K-State as an internationally recognized center for mirror symmetry,” said Louis Pigno, professor and head of the Department of Mathematics. “The scope of the second Focused Research Grant is on the connection of the calculus of functors, a relatively new method of stratifying invariants into a hierarchy of invariants, to the theory of operads.”

Operad theory is an algebraic machine that has been developed to study systems of operations satisfying algebraic properties. Parts of the project have implications for applied subjects like computer science.

An important component of both Focused Research Grants is the creation of a solid collaborative network of postdocs and graduate students in an integrated research-training environment. This includes workshops, conferences, summer schools and seminar series, some of which have or will take place at Focused Research Grant nodes and at international venues. They include a conference in mirror symmetry funded by the Focused Research Grant, July 3-8 in Split, Croatia; workshops on calculus and operads in Banff, Canada, in summer 2011; and the 2012 Conference on Operads, Calculus and Chromatic Homotopy in spring 2012 at the University of Virginia.

Friends of Mathematics lecture and banquet a feast for accomplishments and more

The accomplishments of K-State mathematics students and a distinguished mathematics alumnus were celebrated at the 2011 Friends of Mathematics Banquet, April 28, at the K-State Student Union.

Igor Rodnianksi, who received his doctorate in 1999 under the direction of Lev Kapitanski, received the department's Distinguished K-State Mathematics Alumnus Award. Since graduating from K-State, Rodnianksi has been a professor of mathematics at Princeton University, where he is the Henry Burchard Fine Professor of Mathematics. He was a Long-Term Prize Fellow of the Clay Mathematics Institute, and has been a visiting professor at MIT, the University of Cambridge and several other institutions.

Chandler Davis, a professor at the University of Toronto, gave the annual Friends of Mathematics Lecture the afternoon of the banquet and gave a short address at the banquet. Davis is an expert on linear algebra and operator theory who has made important contributions to numerical analysis, geometry and algebraic logic. He is a co-editor-in-chief of the Mathematical Intelligencer and is a published science-fiction writer.

Student recognitions at the banquet can include a scholarship awarded by K-State and funded either by a well known national foundation or by funds created through the generosity of the Friends of Mathematics over the years. Some recognitions can take the form of smaller gifts. This includes the awards to students in grades 5-12 for their performance in the annual Manhattan Mathematical Olympiad, which is organized by Yan Soibelman, professor of mathematics.
In memoriam
— David B. Surowski

David Surowski, a professor in the Department of Mathematics from 1977 to 2003, died in early March 2011 in Xi An, China, after a three-year battle with pancreatic cancer.

Surowski received his doctorate in mathematics from the University of Arizona in 1975. He joined the K-State faculty in 1977 and became a full professor in 1989. He was appointed the Math Department’s director of graduate studies in 1986 and remained in that post until his retirement in 2003.

Surowski was the author of some 30 published articles on group theory, and he also directed three doctoral dissertations and three master’s theses. He was a recipient of the William L. Stamey Award for Excellence in Undergraduate Teaching from the College of Arts and Sciences and was cited several times as an outstanding faculty teacher in the graduate program. In addition, he directed both the Summer Science Institute for high-ability high school students from 1985-1987 and the Kansas Board of Regents’ 1988 Regents Summer Academy for gifted students.

Surowski developed an interest in Chinese culture and was inspired to learn Mandarin, which, after years of hard work, he could speak fluently. In 1986 he founded the K-State table tennis club, serving as its faculty advisor until his retirement. He brought elite table tennis tournaments to Manhattan, and the club grew over the years. He greatly enjoyed fishing and rising before dawn, always hoping to catch a giant catfish. He took great joy in being involved with his three daughters’ athletic events, particularly coaching softball.

He married Susan Zhang in 1996, and in 2003 moved to Shanghai, China, to join his wife at the Shanghai American School. During his seven years teaching at the school, he was an immensely popular teacher.

A memorial service for Surowski was held March 12, 2011, at K-State’s All Faiths Chapel. The large crowd mourned his passing and celebrated his life. Former students, colleagues, friends and relatives told their favorite stories about him — all testaments to his teaching talents, enthusiasm for mathematics and Chinese culture, his warmth and gentle nature, and his love for his family.

Surowski is survived by his wife, Susan; three daughters; a stepdaughter; a brother; his father; and six grandchildren.

The Surowski family has established the David Surowski Memorial Scholarship in Mathematics. To contribute visit www.found.ksu.edu/math/surowski.html
Grant booster: Professor’s work at National Science Foundation could help Math Department, K-State land more research funding

A Department of Mathematics professor has been learning firsthand about the future direction of scientific research while serving as a program director for the National Science Foundation in Washington, D.C.

Zongzhu Lin says that his experience as program director should benefit K-State.

“Part of my purpose of serving as an NSF program director is to provide myself with a broader vision of science research, such as its current trends and future directions,” he said. “This special opportunity also is helping me understand the grant-proposal reviewing and decision-making process at the National Science Foundation so I can bring this back to K-State.”

Lin is on an unpaid leave of absence from K-State while he works for the foundation. He started as a program director on an intermittent basis in August 2008, becoming a full-time program director in January 2009. He finished his duties this summer, and returned to K-State for the fall 2011 semester.

Lin said program directors organize the evaluation process of submitted proposals, manage the program budget and make recommendations on whether to award or decline a submitted proposal.

“For awarded grants, the program directors periodically check the progress of the projects to make sure they are on track, make recommendations on future funding commitment to previously awarded grants, and review the grant’s annual progress report and final project report,” he said.

Program directors also write project highlights to inform the general public of the achievements of these supported projects and their impacts,” Lin said. “In addition, we participate in various hearings and meetings to learn national priorities on science and technology, as well as government policy and initiatives in these areas.”

Lin said program directors also continue with their own research. Lin has periodically returned to K-State for his research and to work with his graduate students. Even when he is not physically on campus, he is still involved with K-State Mathematics Department business, including supervising his three doctoral students on their research by using Internet video tools.

Lin said his experience would help him train K-State graduate students and junior faculty members on research proposal writing and increase their chances of being funded.

“This position has provided me with the experience to evaluate proposals or projects on their strengths and weaknesses from a much broader context than just my own research field,” he said.

“I have been back to K-State several times to meet individually with some faculty members who are preparing National Science Foundation proposals, as well as to work with my graduate students’ research projects. I also have been mentoring a few junior faculty members in the Mathematics Department on their research proposals by showing them how to write them for the grant programs that will best suit their work. I plan to expand this training to the broader K-State academic community when I return.”

Several distinguished faculty now professors emeritus

Several prominent and distinguished department faculty members have retired over the past several years. These emeritus faculty members include:

• **Professor Lige Li** joined the K-State mathematics faculty in 1986 after earning his doctorate from Tulane University that same year. He taught a variety of courses, including many in his specialties of differential equations and applications of differential equations to biological systems. He published 16 research papers and directed the doctoral dissertations of six students. He received the department’s Outstanding Graduate Faculty Teaching award in 1990.

• **Professor Sadahiro Saeki** received his doctorate from Tokyo Metropolitan University in 1970 and joined the K-State faculty in 1981. He earned K-State’s highest faculty ranking of university distinguished professor in 1988. Saeki is the author of more than 60 research publications in the area of analysis. He directed the doctoral dissertations of four students. He was an invited lecturer at major conferences in Canada, France, Japan and Poland, and gave lectures at universities throughout the world. Saeki retired to his native Japan.

• **Professor George Strecker** graduated from Tulane University with a doctorate in 1966 and joined the K-State faculty in 1972. He is the author of more than 50 research publications in topology and category theory, five monographs and four books. He directed the doctoral dissertations of 12 students. His many honors include a Fulbright Fellowship and a Woodrow Wilson Fellowship. He gave many invited colloquium talks, seminar talks and addresses at conferences throughout the world. He still lives in Manhattan but spends a considerable amount of time in Italy.

• **Professor Forrest Miller** received his doctorate in mathematics from the University of Massachusetts in 1968, the same year he joined the K-State faculty. He was promoted to associate professor in 1975 and full professor in 1984. Miller is the author of more than 25 research papers in geometry and mathematical physics as well as a classic textbook on differential manifolds and theoretical physics. A hiatus in his long and distinguished career at K-State occurred when he was a research associate, supported for several years by the Swiss National Science Foundation, at the University of Geneva. A superb teacher and coordinator of calculus, he was known affectionately throughout the department as Mr. Multivariable Calculus. In addition to his research in geometry and mathematical physics, Miller is the author of 10 papers on statistics and its applications.
Lecture series highlights how mathematics adds up to great career opportunities

The 2010 Undergraduate Lecture Series in Mathematics gave K-State students a taste of what they can do with a degree in mathematics and ways they can enhance their career opportunities.

Speakers for the series included nine mathematics alumni, three visiting professors and two K-State faculty and staff members. Here’s a look at the lecturers and their presentations:

• Roger Bey, professor and chair of the department of finance and operations management at the University of Tulsa, discussed “Careers in Finance and Operations Management for Math Majors.” He talked about the interrelationship between mathematics and finance, and said that math majors are ideal candidates for graduate programs and careers in finance.

• In his lecture “How Can I Do Mathematical Research? I’m Only an Undergrad!,” Kurt Bryan, professor of mathematics at the Rose Hulman Institute of Technology in Terre Haute, Ind., discussed the excitement, possibilities and benefits of getting involved in research as an undergraduate. He used examples of various undergraduate research problems, including the motion of a pendulum, impedance and thermal imaging, and cloaking and invisibility in imaging.

• What do coin flips, Markov chains and Google’s PageRank have in common? Francis Fung, a 1992 K-State mathematics bachelor’s graduate, knows. His lecture explored a circle of ideas that started with this problem: What is the expected number of times one must toss a coin in order to get two heads in a row? He derived the solution using Markov chains to model probabilistic transitions between the states of a system, and then discussed how Google’s PageRank algorithm uses Markov chains to deliver the most relevant pages for Web search queries. Fung is now a software engineer for Google.

• The origins of numbers and cultural differences in mathematics were the topic of Gary Gabrielson’s lecture, “Numbers — Left to Right or Right to Left.” Gabrielson, who earned a bachelor’s and a master’s in mathematics from K-State in 1963 and 1968, respectively, discussed where Hindu-Arabic and other numerals came from and how some cultures write their numerals and their multiplication algorithms from right to left, while others write them from left to right. Gabrielson is a senior systems engineer for Raytheon Corporation and an adjunct instructor at Pikes Peak Community College in Colorado Springs, Colo.

• What mathematics students can do to boost their hiring chances is what Jacqueline Gatson, assistant director of K-State’s career and employment services, discussed in her lecture, which included tips on how to take advantage of the All-University Career Fair, internships and co-op work experiences.

• How safe is nuclear power? Heather Gepford, who earned bachelor’s degrees in mathematics and physics from K-State in 1988 and then went on to earn graduate degrees in nuclear engineering, described the probabilistic risk assessment and safety management processes for nuclear power plants and summarized the applications, strengths and weaknesses of probabilistic modeling in her presentation “Probabilistic Risk Assessment and the Nuclear Power Industry.” Gepford is a technical assistant with the Nuclear Regulatory Commission in Atlanta, Ga., and said that the safety goals of the commission are especially impressive when compared to other societal risks, such as dying in a travel accident.

• Does media sensationalism get in the way of the facts? That’s what Brandon Grossardt explored in his lecture, “Lies and the Lying Liars Who Tell Them.” Grossardt, who earned a bachelor’s in mathematics in 2001 and a master’s in statistics in 2003 from K-State, described various case control studies and cohort studies linking cigarette consumption and lung cancer deaths. He looked at the media sensationalism on grilled meat consumption, cellphone use and BPA exposure, comparing the media reported news with the evidence. He also discussed his work as a Statistician III at the Mayo Clinic, Rochester, Minn., and with the Rochester Epidemiology Project.

• Advice on how to excel in mathematics and how students can enhance their math studies were the topics of lectures by Marianne Korten, K-State professor of mathematics. Korten made three presentations in the lecture series: “How To Be the Best Math Student You Can Be”; “Research Experience for Undergraduates”; and “Graduate Studies in Mathematics.”

• Mark Lesperance sugar-coated his lecture to help show ways math and statistics are used in actuarial careers. Lesperance, who earned a bachelor’s and a master’s in mathematics from K-State in 1990 and 1991, respectively, presented “A Delicious Introduction to Auto Rates and the Actuarial Profession.” He outlined the types of problems that actuaries solve and used M&M’s to help explain the complexities of insurance pricing. Lesperance is an actuarial analyst for Producers Agriculture Insurance Company in Amarillo, Texas. He also teaches courses at K-State to prepare students for the first four actuarial exams and the Time Series Verification of Educational Experience.

• Two K-State mathematics alumni teamed up to discuss how to find an actuarial internship. Eric Mann, who earned bachelor’s degrees in mathematics and statistics in 2006, and Kevin McBeth, who earned bachelor’s degrees in mathematics, statistics and economics in 2007, covered how to pass an actuarial exam, do well at college, look for companies to apply to, prepare a resume and cover letter, and interview. They focused on the resources available at K-State to make students great internship candidates. Mann is an actuarial analyst for Allstate Insurance in Mount Prospect, Ill., while McBeth is a bond and financial actuary for Travelers Insurance, Saint Paul, Minn.

• In “K-State B. S. Math Degree + Nancy = the End of the Rainbow,” Nancy Roemer described her journey from K-State and the Land of Oz to the end of the rainbow in Hawaii. Roemer, who earned her bachelor’s in mathematics
from K-State in 1966, provided examples of her work for governmental agencies. She analyzed ballistic data and MiG-25 Foxbat performance for the Foreign Technology Division, studied aircraft tracking radar systems for the FAA Technical Center, and managed weapon system data and provided logistic support for the Joint Intelligence Center. She currently serves as an information technology specialist for the Defense Intelligence Agency.

- How can following your interest lead to a career you want? Katherine Socha explained it in “Procrastination for Pleasure and Profit: How following your interests (even the ones that seem like procrastination) can lead to a great career.” She told the story of how she became a mathematician, even though she was a fiction-loving, math-phobic tennis player in high school, and what unusual career opportunities she discovered along the way. She said it’s been her personal observation that students learn almost as much from their fellow students as from their professors. Socha is an American Association for the Advancement of Science policy fellow in the National Science Foundation’s Division of Mathematical Sciences and director of education policy for Math for America in New York City.

- K-State alum Chet Wilcox, who earned a bachelor's in mathematics in 1961 and a master's in statistics in 1963, discussed how a mathematics degree can lead to a scientific career. Wilcox presented “Probability, Random Walk and Decision Theory — A Math Major’s Toolkit for Optimizing One’s Pathway Through a Scientific Career?” He covered probability distributions, the basics of statistics, random walks, Monte Carlo simulations and more. He also gave two bedrock principles to enhance students’ chances of being successful in college and their career: have goals and a plan, but be flexible; and know what is expected of you, then do more. Wilcox is a retired operations research analyst for Lockheed Aircraft Corporation in Burbank, Calif., and the Naval Meteorology and Oceanography Command at the Stennis Space Center in Mississippi.

Alumni notes

Ronald L. Dillon, Cumberland Center, Maine, is a senior consultant with Strategic Asset Management Int'l LLC. He has previously served as a captain in the U.S. Navy Reserve, retiring in 1985, and vice president, manufacturing operations in Europe, for Haworth Inc., retiring in 2006. He earned his bachelor's in mathematics in 1961 and his master's in statistics in 1969.

George Heroux, who earned his master's in 1973, is now retired from an education position and living in Cushing, Minn.

Donald E. Myers, who earned his bachelor's in 1953 and his master's in 1955, is a professor emeritus of mathematics at the University of Arizona. He was appointed the 2008 International Association of Mathematical Geologists distinguished lecturer and University of Arizona. He was appointed the 2008 International Master's in 1955, is a professor emeritus of mathematics at the University of Arizona.

K-State Mathematics Alumnus Award:

- Evan Stewart, a 1965 bachelor's graduate, gave the talk “Curiosity is the Ants in the Pants of Life” for the lecture series in 2009. Stewart recently retired as vice president and chief information officer of B/E Aerospace Inc. in Winston-Salem, N.C. Stewart was the distinguished K-State Mathematics Alumnus for 2010.

- Jim Baxter, a 1963 bachelor's graduate, spoke about “Lessons Learned in Solving the Complex Equation of Career Planning” in a 2007 lecture. Baxter is owner and president of Sutton Homes in Orlando, Fla. He previously served as a vice president for PepsiCo Food Service International and for Tupperware, and as the president of Brazos Valley Restaurants. Baxter was the Distinguished K-State Mathematics Alumnus for 2008.


- Gary Gabrielson, a 1963 bachelor's graduate and 1968 master's graduate, presented “Travels of a Kansas Farm Boy with a Mathematician's Eye” in the 2006 lecture series. Gabrielson is a senior systems engineer at Raytheon Corporation in Colorado Springs, Colo. Gabrielson was the Distinguished K-State Mathematics Alumnus for 2006.

- Don Myers, a 1953 bachelor's graduate and a 1955 master's graduate, presented “Mathematics, Dream Big” for the lecture series in 2006. Myers, who earned a doctorate in mathematics from the University of Illinois, is a professor emeritus of mathematics at the University of Arizona in Tucson. He was the Distinguished K-State Mathematics Alumnus for 1991.
Lectures feature range of prominent international mathematicians

During the 2010-2011 academic year, the Department of Mathematics welcomed a variety of distinguished lecturers to Cardwell Hall from top institutions around the world, from Yale to the University of Sydney. Speakers included:

- **Vera Serganova**, University of California at Berkeley
  
  **37th William J. Spencer Lecture**
  
  “Beyond Schur-Weyl Duality for $\mathfrak{sl}(\infty)”
  Oct. 5, 2010
  Professor Serganova received her doctorate from Leningrad University and serves on the editorial board of the Journal of Algebra.

- **Katherine Socha**, St. Mary’s College of Maryland and AAAS science and technology policy fellow in the National Science Foundation Division of Mathematical Sciences
  
  **11th Virginia L. Chatelain Memorial Lecture**
  
  “Sea Battles, Ben Franklin’s Oil Lamp, and Jellybells”
  Oct. 19, 2010
  Professor Socha is currently the director of education policy at Math for America, where her duties include advising the national program on education policy, outreach to the education and mathematics communities and overall evaluation of the Math for America sites.

- **Fulvio Ricci**, Scuola Normale Superiore di Pisa, Italy
  
  **12th Karl Stromberg Memorial Lecture**
  
  “Uncertainty Inequalities and Spectral Analysis of Differential Operators”
  Oct. 21, 2010
  Professor Ricci is a full professor of analysis at the Scuola Normale Superiore di Pisa, where he was dean of the faculty of sciences from 2002 to 2008. He's held visiting positions in the U.S., Argentina, Australia, China, France, Poland and Sweden.

- **Marco Abate**, University of Pisa, Italy
  
  **38th William J. Spencer Lecture**
  
  “Dynamics of Holomorphic Maps Tangent to the Identity and Homogenous Vector Fields”
  Oct. 28, 2010
  Professor Abate is a full professor of geometry in the Department of Mathematics at the University of Pisa. He has written numerous papers and authored or co-authored several books.

- **Bernard Leclerc**, University of Caen, France
  
  **39th William J. Spencer Lecture**
  
  “Cluster Algebras and Tensor Products”
  Nov. 2, 2010
  Professor Leclerc has taught mathematics at the University of Caen since 1995. He also serves as director of the Laboratoire de Mathematiques Nicolas Oresme and he is a member of the Insititut Universitaire de France.

- **Michael Taylor**, University of North Carolina
  
  **6th Brent P. Smith Lecture**
  
  “Waves on Hyperbolic Space”
  Dec. 9, 2010
  Michael Taylor received his bachelor's from Princeton University and his doctorate from the University of California at Berkeley. He’s published eight books, including a three-volume treatment of partial-differential equations.

- **Alexander Molev**, University of Sydney
  
  **40th William J. Spencer Lecture**
  
  “Littlewood-Richardson Polynomials”
  Feb. 10, 2011
  Professor Molev received both his bachelor's and doctorate from Moscow State University. He has held visiting positions in Brazil, Canada, France and England. He received the Australian Mathematical Society Medal in 2001.

- **Grigory Mikhalkin**, Universite de Geneve, Switzerland
  
  **41st William J. Spencer Lecture**
  
  “Classical Algebraic Geometry in the Tropical Limit”
  Feb. 17, 2011
  Professor Mikhalkin received a doctorate from Michigan State University, a Cand. Sci. from the St. Petersburg Branch of the Steklov Mathematical Institute and a diploma with excellence from Leningrad University. He’s had short-term visits to Brazil, France, Germany, Japan and Sweden and is presently professeur ordinaire at the Universite de Geneve.

- **Boris Kheisn**, University of Toronto
  
  **42nd William J. Spencer Lecture**
  
  “Topological and Symplectic Hydrodynamics”
  March 31, 2011
  Professor Kheisn received both his master's and doctorate from Moscow State University. He’s received a number of accolades, including the Premier’s Research Excellence Award (Ontario, Canada) and the Alfred P. Sloan Research Fellowship.

- **Michael Shapiro**, Michigan State University
  
  **43rd William J. Spencer Lecture**
  
  “Quivers of Finite Mutation Type”
  April 21, 2011
  Professor Shapiro received his bachelor's and master's from the Moscow Railway Institute and his doctorate from Moscow State University. He has received numerous grants to support his research and has taught extensively around the world.

- **Chandler Davis**, University of Toronto
  
  **29th Annual Friends of Mathematics Lecture**
  
  “Some Forgotten Matrix Theorems”
  April 28, 2011
  Friends of Mathematics Awards Banquet
  
  “Splashing Down Safely”
  Dr. Davis received his doctorate from Harvard in 1950 and is known for many mathematical contributions over the last 60 years. He served as vice president of the American Mathematical Society and is editor in chief of The Mathematical Intelligencer.

- **Mikhail Kapranov**, Yale University
  
  **21st Harry E. Valentine Lecture**
  
  “Arakelov Coherent Sheaves and Their Hall Algebra”
  May 3, 2011
  Professor Kapranov received his bachelor's from Moscow University and his doctorate from Steklov Institute. He is a professor of mathematics at Yale University.
Your support makes a difference

Scholarships, lecture series, world-class lecturers, competitions and more. They enhance the educational experience offered by the Department of Mathematics and are crucial to the department’s continued growth and success.

But these programs would not exist without the substantial gifts we have received from our alumni and friends over the past several decades.

These generous gifts have allowed us to establish scholarships for talented undergraduates — the Hostinsky, Fuller, Miller, Stromberg and Rector scholarships — as well as the S. Thomas Parker scholarship competition and Fung’s Achievement Award.

These gifts also helped the department establish the Dressler, Spencer, Valentine, Thomas, Stromberg, Smith, Chatelain and Friends of Mathematics lecture series, all of which bring the world’s best mathematicians to our department to lecture.

The importance of these scholarships and lecture series for mathematics at K-State cannot be overemphasized. Gifts to the department, large and small, have had a profound effect on both our undergraduate and graduate programs and have raised the reputation of our department regionally, nationally and internationally.

Here’s the proof:

- Our graduate program has granted 63 master’s degrees and 29 doctorates over the past 10 years.
- Our doctorate and master’s graduates are employed at educational institutions in all levels, as well as in the insurance industry, the financial industry and with government.
- Based on current rankings by the National Research Council, our graduate program is ranked higher than most other regional programs in mathematics.

- Twenty-seven K-State mathematics majors have now won Goldwater Scholarships. With 64 total Goldwater scholars, K-State ranks first among the nation’s 500 public universities.
- Recent K-State mathematics graduates have gone on to graduate study at dozens of highly ranked universities throughout the world.
- Our graduates are employed by insurance companies, financial institutions, government, the defense industry, scientific labs, the communication industry and as teachers.
- Our mathematics majors have recently earned a Fulbright Scholarship, the Clare Boothe Luce Scholarship, a Department of Defense Research Fellowship and three National Science Foundation Graduate Research Fellowships. Six of our majors have been McNair Scholars. One major recently earned honorable mention for the Alice T. Schafer Prize.
- Many of our majors are involved with summer internships or research at companies and academic institutions throughout the U.S. and across the world.

Help us keep this momentum going. We want to continue providing scholarships to attract top students. We are, and want to continue to be, recognized for our use of computers and technology in our courses and for the important skills these provide.

Scholarships and technology represent pressing financial needs for our department. That’s why we call on all our alumni and friends to continue helping us attain our goal of becoming one of the top 50 mathematics departments in the U.S., and to allow us to continue to provide an excellent education for our students.

You can find out more about our current — and past — achievements at our department webpage, math.ksu.edu, and remember to follow us on Facebook at facebook.com/group.php?gid=138010466235

You can now donate online at www.found.ksu.edu/math

Alumni Survey

Name __________________________

Class and degree __________________________

Address __________________________

Phone __________________________

E-mail __________________________

Home page address __________________________

Company or graduate school __________________________

Occupation and title __________________________

Recent promotions, awards, or special achievements in your work __________________________

Personal happenings you would like to share __________________________

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You may also file a written complaint with the U.S. Department of Education, Office for Civil Rights, 500 Independent Avenue S.W., Washington, D.C. 20202, by calling 1-800-321-0522, or by filing a complaint electronically through the Office of Civil Rights’ internet complaint form, available at http://www2.ed.gov/about/offices/list/ocr/.

You may also file a formal complaint with the Equal Employment Opportunity Commission, 1401 Constitution Avenue N.W., Washington, D.C. 20507, by calling 1-800-786-3600.

You may also file a formal complaint with the Kansas Department of Labor, Equal Employment Opportunity Section, 138 Cardwell Hall, Manhattan, KS 66506-0124, by calling 785-532-6220; (TTY) 785-532-4807.