



## THE VISION

The Department of Mathematics is the internationally recognized leader in mathematical instruction innovation – particularly for its developments in inquiry-based learning and in postdoctoral training, with the largest program of any university mathematics department in the country. The extent and commitment to inquiry-based learning, to the undergraduate research experience, and to the professional development of its graduate students and postdoctorates sets the Department apart.

And for over 75 years, the Department of Mathematics has also been one of the world's premier research centers, consistently ranked in the top 10 and noted for the depth and breadth of its research and many important innovations. The challenge ahead is to maintain, in an extremely competitive environment, the quality of the Department's research and instructional program, while becoming more interdisciplinary so that mathematicians can play leading roles in research endeavors in other disciplines – a development that is characterizing research in the 21st century. Our goal is to be recognized as one of the top five mathematics departments in the country for excellence in education and research.

## THE VALUE

Our faculty and students contribute to expanding the knowledge of fundamental mathematics and its uses in other disciplines. While mathematics was once the province of a few, it has now become an essential component for many livelihoods. The Department enrolls over 10,000 students annually in its elementary programs, providing them with the foundation for their studies at the University and provides undergraduate mathematics majors a thorough grounding in mathematics and its applications. Our graduate students are well prepared for a research and teaching career, and our postdoctorates receive the career foundation and training that will help them shape the next generation of mathematicians.

The Department has an important role to play in community outreach as well. UM Mathematics actively participates in the NSF-funded Center for Proficiency in Teaching Mathematics, whose mission is the improvement of instruction of future teachers in middle and secondary schools. The Department also manages the Michigan Math and Science Scholars Program, which brings intensive study of math and science to high school students during the summer.

## THE DIFFERENCE

In order to maintain its leadership role in research, expand its interdisciplinary programs, and enhance the student learning environment, the Department depends heavily upon financial support from alumni and friends. Gifts to any of the following will help in achieving the Department goals.

### Center for Risk Analysis

**\$5 million**

For 100 years, the Department has provided instruction in actuarial mathematics and has been the nation's leader in instruction and research in actuarial mathematics, with a very distinguished group of alumni. We now have a faculty of 5 full time professors and several adjuncts from industry. In addition to actuarial insurance, we offer instruction in casualty insurance, pensions, and mathematics of finance (derivatives). Also, the Department, in collaboration with Industrial and Operations Engineering and the Ross School of Business, offers a Master's degree in Financial Engineering.

Looking to the future needs of society, such as the many important quantitative problems of analyzing risks in public insurance systems like Medicare and Social Security, the Department has expanded this program to include a wider range of problems where risk is an essential element. This larger program is highly interdisciplinary and initially focuses at the Bachelors and Masters levels, but the goal is also to develop a thriving doctoral program as well. To expand the program, we must be able to recruit outstanding faculty to the Department and provide retention incentives. And we must be able to offer scholarships and fellowships to attract the most talented students. Endowing these awards will assure that we are able to be an innovator in the field and are able to provide talented graduates for successful careers in various fields for years to come. Graduate fellowships in this Center can be endowed for \$750,000, and an endowed undergraduate scholarship in the amount of \$100,000 will support one student in this program.

### **Named Endowed Professorships** **\$3 million each**

To maintain its leadership in research and in teaching, the Department needs to retain current faculty and to continue recruiting at the highest level in a fiercely competitive environment. An endowment of \$2 million would provide a competitive annual salary for a distinguished professor. An additional endowment of \$1 million would support a modest research fund. We seek endowed professorships for pure mathematics, for applied mathematics, and for the Center for Risk Analysis.

### **Applied and Interdisciplinary Mathematics Program (AIM)** **\$3 million endowed**

While the Mathematics Department has always supported instruction and research in applied mathematics and actuarial science, the growing needs and demands for interdisciplinary research has led the Department to establish the AIM Program. This doctoral degree program requires students to have extensive course work in another discipline and is attracting a substantial number of bright students who are pursuing innovative research in various fields including: Mathematical Physics (Fluid Dynamics, String Theory), Modeling in Engineering (Materials, Aeronautics, Control Theory), Mathematical Biology (Epidemiology, Cancer), Informatics (Algorithms, Theoretical Computer Science), Risk Analysis (Insurance, Financial Engineering, Health, Contamination), and Mathematical Economics. This program maintains a vital link between mathematics and the life sciences initiative. To expand the program, we need additional faculty that an endowment would make possible.

### **Named Associate Professorship** **\$1 million endowed** **\$50,000 annually**

To recruit outstanding young faculty, the Department needs to provide both a competitive salary and time to develop their ideas. Supplementing the salary and allowing for more time for research allows an Associate Professor of exceptional talent to concentrate on research and educational innovation at a critical time in their scholarly development and assists the Department in recruiting at the highest level. An annual gift coupled with a bequest could have immediate impact and ensure such continued opportunities for bright scholars.

### **Named Postdoctoral & Graduate Student Fellowships** **\$1 million endowed**

Postdoctoral faculty play a vital role in refreshing the program with new ideas and research. In learning new approaches to teaching and research, these young scholars have much to offer current students. Very talented students are essential for a top qual-

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ity department, and competition for them is intense. External funding is needed to attract the very brightest and best postdoctorates and graduate students.

### **Distinguished Lectures**

**\$20,000 to \$200,000 endowed**

To keep current with groundbreaking research developments, it is essential for the Department to invite those making innovative discoveries to campus to give presentations and to be available for consultation. The cost for a single lecture averages \$1,000, while a lecture series could be up to \$10,000. Ideally funding for some of the colloquium lectures would come from an endowment and would be named after the donor. Annual gifts can also be designated for this purpose, and with an endowed commitment, would be named after the donor.

### **Undergraduate Scholarships**

**\$200,000 endowed**

Attracting bright undergraduate students to the Department and to the University is essential to achieving excellence in mathematics education. Far too often, the cost to attend the University of Michigan is in excess of 25% of a family's total annual income. Providing assistance to outstanding students in need not only benefits the students, it strengthens our program and our ability to provide future productive members of society with the most competitive skills. Named undergraduate scholarships can be funded by endowments of \$200,000. Funding these scholarships is a high priority.

The Department also has a Scholarship Fund that is funded by annual gifts of any size. It provides another way for friends of the Department, especially alumni, to contribute. A gift of \$500 annually equals the income from an endowment of \$10,000.

### **Mathematics Strategic Fund**

**\$100,000**

Each year, the Department faces unexpected opportunities to extend its mission that are not funded by the standard state budgeting process. An expendable account would allow the department to respond to such opportunities and address unexpected special needs and provides the Department Chair resources that support exceptional cutting edge work that will have a high impact on mathematics, our students, or our department. Continuous endowed funds would also help to meet faculty retention needs and provide start up assistance for new faculty. Endowments for these funds can start at \$100,000, with a total goal of \$2 million.

All donors will be eligible for Presidential Society Recognition opportunities, including the President's Club (\$15,000), the Tappan Society (\$50,000) and the Hutchins Society (\$100,000).