

Math center at Rutgers wins new U.S. backing

By KITTA MacPHERSON

A mathematics research center based at Rutgers University has won a renewed commitment from a federal science agency that will funnel \$10 million to the center during the next five years.

The renewed endorsement of the 3-year-old Center for Discrete Mathematics by the National Science Foundation is a signal, officials said, that the founders of the facility are doing what was initially promised—building a world-class research cluster in the emerging mathematical discipline.

The National Science Board, the policy-making body of the National Science Foundation in Washington, D.C., approved the renewal award for the Piscataway-based center as one of nine renewals for agency-funded science and technology centers. The federal science agency established the science and technology research program to promote basic research that can most effectively be accomplished through centers—complex research problems that are large-scale, of long duration, and that may require special facilities or collaborative relationships.

"The Science and Technology Centers are unique because they link university and industry researchers in long-term basic research projects," said Walter Massey, director of the NSF. "The centers foster new knowledge and innovations in many important fields—scientific and technical fields that are crucial to our nation's future."

Daniel Gorenstein, a Rutgers mathematician who directs the center, said he was happy about the renewal, especially in light of the federal govern-

\$10 million indicates high-quality research

ment's tight spending policies.

"I think we have become the accepted world center in the area of discrete mathematics and theoretical computer sciences at this point," Gorenstein said.

Discrete mathematics, as opposed to the "continuous" mathematics of calculus and differential equations, deals with finite sets of information. One simple problem in discrete math might be discerning how many different hands are possible in a poker game using one set of cards.

Slightly more than 20 years old, it is an area of math that has grown relevant with the advent of computers and the vast databases created by them. Higher levels of discrete mathematics devise shortcuts or "algorithms" through the mountains of data to obtain solutions.

The branch of mathematics has wide applications to problems in the fields of telecommunications, transportation, engineering and cryptography.

More than 100 mathematicians, drawn from Rutgers, three other sponsoring institutions and a few other places, conduct research at the center located on the university's Busch Campus in Piscataway. Along with Rutgers, other sponsors of the center are Princeton University, AT&T Bell Laboratories in Murray Hill and Bellcore in Livingston. The center

also sponsors math seminars for high school teachers and students.

The center was established at Rutgers three years ago with a \$9.8 million grant from the NSF. It was the largest one-time grant received by the state university in its history.

In the first year of the center's operation, Princeton mathematician Bernard Chazelle solved a longstanding math problem that said a polygon in a plane could be cut up into triangles in a more efficient fashion than had ever been achieved before. "That's regarded by everybody as an absolutely major achievement; it has implications for telecommunications, for the way major networks are designed, and other topics," Gorenstein said.

The Rutgers-based center is one of nine university-based science and technology centers that received funding extensions from the federal science agency. The others are based in California, Michigan, Illinois, Oklahoma, Texas and New York, and are focused on astrophysics, electronics, microbial ecology, advanced cement-based materials, storm prediction, parallel processing, light-driven chemical reactions, and high-temperature superconductivity.

The federal science agency, an independent foundation, was founded in 1950 to promote and advance scientific progress in the United States. It attempts to accomplish this by competitively awarding grants to educational institutions for research and education in the sciences, mathematics and engineering.

Rutgers' original plan for the center was selected out of 323 proposals submitted nationwide.