

Simons Foundation Launches US\$40-Million Program for Theoretical Research

Allyn Jackson

The Simons Foundation has launched a program that is now spending an estimated US\$40 million a year to support research in mathematics and theoretical aspects of areas related to mathematics. The program began in fall 2009, creating seventy postdocs intended to ease the effects of the tight academic job market.

In mathematics, US\$40 million is a serious chunk of change: For comparison, the yearly budget of the Division of Mathematical Sciences at the National Science Foundation (NSF) was US\$226 million in fiscal year 2009. The Simons Foundation program will not be solely devoted to mathematics but will also fund “theoretical science radiating from mathematics”, as David Eisenbud put it. Eisenbud, a professor at the University of California Berkeley and former director of the Mathematical Sciences Research Institute (MSRI), is heading up the program as the Simons Foundation Vice President for Mathematics and the Physical Sciences.

James Simons, of Chern-Simons invariant fame, has made billions through his investment company, Renaissance Technologies. In 1994 he and his wife Marilyn established the Simons Foundation, which supports basic science and mathematics. The Simons fortune also funds Math for America, a separate entity from the Simons Foundation that focuses on attracting and retaining outstanding individuals to teach mathematics in public secondary schools. In 2009 James Simons, seventy-one years old, announced he is retiring from day-to-day management of the firm he has run for thirty-one years and will spend

more time on his philanthropic work, which also includes support for autism research.

“The mission of the Simons Foundation is to support basic scientific research,” said James Simons in an email message. “There is already an active program in the life sciences, and several important but isolated activities in mathematics and the physical sciences, such as the newly founded Center for Geometry and Physics, but there is no coherently articulated program in the latter area. David Eisenbud was brought on to establish such a program, and over the next several months he will be gathering ideas and advice to guide him in carrying out this mission.” (For more information on the center, see “Major Gift to Stony Brook for Simons Center in Geometry and Physics”, *Notices*, June/July 2008.)

The new program does not have a name yet—nor has it been decided exactly how the US\$40 million will be used. But the driving idea is to “strengthen basic research internationally and across science”, Eisenbud said. The plan is to structure the program so that it complements rather than duplicates modes of support already available through existing funders of theoretical research, such as the NSF. Private sources of support for mathematics include the Clay Mathematics Institute, which provides funding for individual mathematicians and specific projects like conferences, and the electronics-chain-store magnate John Fry, who is the main funder of the American Institute of Mathematics in Palo Alto, California. The Simons Foundation program will be “substantially larger” than what these other private funders provide, Eisenbud said.

As a first step in establishing the program, the foundation decided to fund about seventy

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postdoctoral positions, called Simons Postdoctoral Fellowships. Fifteen three-year positions in mathematics and ten three-year positions in theoretical physics will be funded this year and next; in theoretical computer science, nine two-year positions will be offered for three consecutive years. According to Eisenbud, the breakdown of positions was dictated by a sense of the “size of the enterprise” in each area, partly measured by the number of new doctorates in each. With about 1,400 new doctorates last year, mathematics had by far the largest number. The funding will be given to university departments, each of which will be able to hire one or two postdocs recruited from anywhere in the world. Recruitment began in fall 2009, and the positions will start in fall 2010.

The Simons Foundation has decided not to announce publicly the full list of departments receiving the postdoc funds. The selection of mathematics departments was made by a five-member committee of “distinguished mathematicians”, Eisenbud said; parallel committees in theoretical physics and theoretical computer science made the selections in those areas. The awards were made to departments that can nurture postdocs well; they were “*not* seen as rewards to great departments,” Eisenbud noted. The departments were chosen on the basis of “whether the committee felt that people in a reasonably broad range of subjects would advise their graduate students to go to those departments,” he explained.

These postdoctoral positions are sorely needed in the job market facing new and recent Ph.D.s, a market that Eisenbud described as “gruesome”. “The number of postdoctoral positions is down at research universities” by as much as one-half, he said. “This is something we will feel for years.” A survey conducted in early 2009 by an AMS task force on employment estimated that the number of academic positions open to new doctorates had declined by 39 percent from summer 2008 to summer 2009 (see <http://www.ams.org/prof-services/employtaskforce/ETF.html> for the task force report). The NSF pitched in to help in 2009 with a set of temporary postdoctoral positions managed jointly by the mathematical sciences research institutes. These postdocs will probably not be repeated in 2010, absent the flexibility provided by funds from the Obama administration’s one-time stimulus package.

The Simons Foundation decided to give the funds for the postdocs to departments, rather than to individuals, because there was not time to set up a mechanism for reviewing individual applications. In the future, if it does fund more postdocs, it will have a mechanism for direct application by individuals. Will the program in fact

continue to fund postdocs? That is not clear yet—and indeed only a few aspects of the program have been decided upon. One of these is the areas to be supported: mathematics and theoretical topics in areas connected to it, such as theoretical physics and theoretical computer science (but not the biological sciences, which are the focus of a different Simons Foundation program). Support for large experimental facilities is not within the scope of the program, but Eisenbud said that it might be possible to fund some experimental projects “if the right project comes along”. Researchers from anywhere in the world are eligible for support. Unlike grants from the NSF, which pay overhead rates set by the institutions receiving the grants, the grants from the Simons Foundation program will pay only the foundation’s standard overhead rate of 20 percent of certain direct costs.

Exactly what kinds of activities the program will fund has yet to be determined. Asked whether the money might be used for a new institute, Eisenbud said that he thought it unlikely, given that the foundation just recently launched the Simons Center. However, the foundation has been giving funds to enhance activities at some institutes, and this might continue. How about a small grants program, which many mathematicians in the United States have said is what they really need? That is a possibility. “Nothing is settled yet,” Eisenbud said.

“Figuring out something really useful and really effective to do, even with a lot of money, is, I think, not so easy,” Eisenbud remarked. To this end the Simons Foundation will in coming months hold several roundtable events in which mathematicians and scientists “will offer us, we hope, sage advice about how to spend this money,” Eisenbud said. “We will listen hard before we make any decisions.” The foundation will also work closely with organizations such as the NSF and the Clay Mathematics Institute to ensure that the new program complements rather than duplicates existing ones.

Eisenbud said he would be interested in hearing from researchers who have ideas for how best to use the funds (his email address is de@simonsfoundation.org). It is not appropriate at this stage to send proposals for specific research projects; what is needed at this time are ideas about what kind of grant mechanisms would be most effective. Input from a broad segment of the mathematical community can help ensure that this unusual program has a lasting and positive impact on the field.