Complex Math, Simple Sum: 3 Awards in 5 Years

By LISA W. FODERARO
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What are the odds?

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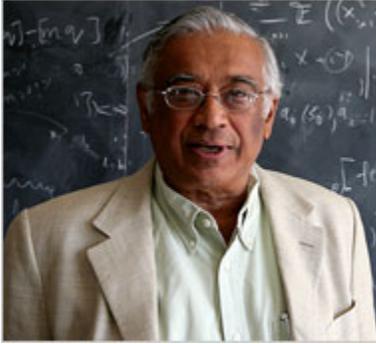Micha Gromov, this year's Abel winner, center, with Queen Sonja and King Harald of Norway.

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Peter D. Lax, a professor emeritus who won in 2005.

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Another N.Y.U. mathematician, Srinivasa S. R. Varadhan, won the prize in 2007 for his work in probability theory.

That's a question the King of Norway asked Srinivasa S. R. Varadhan in 2007 when he was awarded the Abel Prize, widely regarded as the Nobel of mathematics. A professor at New York University, Dr. Varadhan had won for his work in probability theory, becoming the second N.Y.U. professor so honored since the prize was first awarded in 2003.

"When I met with the king and queen, he said, 'Since you're a specialist in probabilities, what is the probability that you'll have another prize winner from your institution?' " Professor Varadhan recalled. "I said, 'Probably very small,' but I was wrong."

Indeed, on May 19 another math professor from N.Y.U., Micha Gromov, traveled to Norway to pick up his Abel, given for what the prize committee called "his revolutionary contributions to geometry." In the process, N.Y.U.'s math department, which has long ranked among the top in the nation, along with those at Princeton, Harvard and Berkeley, has assumed an almost cultlike status.

"It really is phenomenal," said Donald E. McClure, executive director of the American Mathematical Society, a leading professional organization of research mathematicians. "It has the same distinction as a Nobel Prize, and there's no other institution in the United States or in the world that has had such a concentration of these awards."

That the field of mathematics was left out of the Nobel lineup has been a source of mystery and, among mathematicians, irritation for more than a century. (There are, after all, Nobel Prizes in physics, chemistry and physiology or medicine.) Some speculate that Alfred Nobel, a Swedish industrialist who invented dynamite and who established the prizes, simply wasn't a math guy. Others cite a bit of lore that he harbored a grudge against math because a love interest rejected him in favor of a well-known mathematician.

Whatever the reason, in 2001 the Norwegian government sought to fill the void, announcing the creation of the Niels Henrik Abel Memorial Fund. Abel was a Norwegian mathematician who died at 26, but whose genius is legend: Professor Gromov likened him to a "supernova" in his remarks in Norway.

Efforts to finance an international Abel prize date all the way back to 1902, on the centennial of Abel's birth, but fizzled with the breakup of the union between Sweden and Norway a few years later. Like the Nobel, the Abel comes with a substantial bounty: 6,000,000 kroner, or about $950,000 at the current exchange rate.

Dr. Gromov said he was not sure how he would spend the money. "I haven't thought about that yet," he said. "I haven't had time."

The three N.Y.U. recipients are faculty members in the university's Courant Institute of Mathematical Sciences. Two of them, Peter D. Lax, who won the Abel in 2005, and Professor Varadhan, are lifers, having taught and conducted research at N.Y.U. since the middle of the last century. Dr. Lax, a professor emeritus who, at 83, is retired from teaching, earned both his B.A. and Ph.D. from N.Y.U. in the 1940s.

Born near St. Petersburg, Russia, which was Leningrad at the time, Dr. Gromov was a more recent hire, arriving in 1996 from the University of Maryland. He divides his time between N.Y.U., where he teaches in the spring, and the Institut des Hautes Études Scientifiques in France, where he is based in the fall.

The citation from the Norwegian Academy of Science and Letters, which administers the prize, called Dr. Gromov, 65, "one of the leading mathematicians of our time." It went on to say that his name was "forever attached to deep results and important concepts within Riemannian geometry, symplectic geometry, string theory and group theory."

He insists that N.Y.U.'s triple Abel victory is the result of careful recruiting. "That's not a coincidence," he said. "It was the policy of the administration of the university and specifically the institute, which was making right guesses. You have to make these choices judiciously."

Until several years before Dr. Gromov's arrival at N.Y.U., the department was known more for its research in pure mathematics and differential equations than in geometry, he said. It was Dr. Lax who helped put N.Y.U. in the vanguard of such research, according to his Abel Prize citation, with "groundbreaking contributions to the theory and application of partial differential equations and to the computation of their solutions."

Dr. Lax, who was born in Hungary, fled to the United States with his family after Hitler's rise to power. His undergraduate education at N.Y.U. was interrupted in 1944 when he was drafted into the Army. The government quickly realized his mathematical prowess, and the following year, at age 19, Dr. Lax found himself in Los Alamos, N.M., working on the secret Manhattan Project to develop the atomic bomb. "It was like living science fiction," he said.

A longtime Upper West Side resident, Dr. Lax is still busy with research. "I'm struggling with some quite interesting problems," he said with more than a little understatement, nodding toward a chalkboard in his office that was a jumble of numbers and symbols.

While toiling in the same 13-story building off Washington Square Park, the three Abel winners cross paths only occasionally. "Our fields are rather separate, but whenever I have a question about probability I go to Varadhan," Dr. Lax said.

Dr. Varadhan, 69, was born in Chennai, India. After moving to New York in 1963 for a postdoctoral fellowship at N.Y.U., he quickly made Greenwich Village home. He and his wife have lived in the same university-owned building since 1966.

The Abel Prize committee hailed Dr. Varadhan for his "fundamental contributions to probability theory and in particular for creating a unified theory of large deviations." It said the subject has "concrete applications to fields as diverse as physics, biology, economics, statistics, computer science and engineering."

Sitting in his sun-filled office, Dr. Varadhan was happy to translate. "Large deviations deals with the probability of rare events — how likely or unlikely something will happen," he said. "I started on that when I came here in 1963 and I'm still doing it, so it's gradual progress, not one moment."

Like his colleagues, Dr. Varadhan developed a passion for math at a young age. "We had a very good math teacher in high school who instilled in us the idea that math didn't have to be work," he remembered. "You could do it for fun."

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