



The Multimillion-Dollar Minds of 5 Mathematical Masters

By KENNETH CHANG

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Mathematics has turned into an unusually lucrative profession for [Maxim Kontsevich](#). First, Dr. Kontsevich, 49, who works at the [Institute of Advanced Scientific Studies](#) outside Paris, won the 2012 [Shaw Prize in Mathematical Sciences](#), an honor accompanied by a \$1 million award. Then a couple of months later, he was among nine people who received [a new physics prize](#) — and \$3 million each — from Yuri Milner, a Russian who dropped out of graduate studies in physics and became a successful investor in Internet companies like [Facebook](#).

A few weeks ago, Dr. Kontsevich heard from Mr. Milner again. Mr. Milner told him he was one of five inaugural winners of the Breakthrough Prize in Mathematics, financed by Mr. Milner and [Mark Zuckerberg](#), the founder of Facebook; that prize also comes with \$3 million. Mr. Milner officially announced the winners on Monday.

“I was a bit embarrassed, I have to say,” Dr. Kontsevich said of his good fortune.

Mr. Milner recalled: “I think he was laughing. He’s a well-deserving individual. He really sits in the middle between physics and mathematics. And what he’s rewarded for now is pure mathematics as opposed to physics. His work here is really very different from what he got his other prize for.”



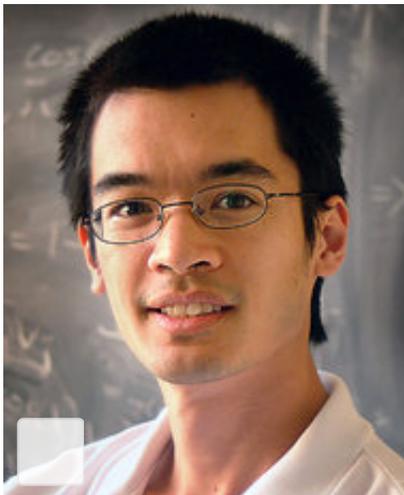
Maxim Kontsevich
BREAKTHROUGH PRIZE IN MATHEMATICS

The citation notes a wide swath of mathematical fields where Dr. Kontsevich repeatedly bumped into unexpected connections. For example, about 15 years ago, he collaborated on what looks like a simple procedure called interval exchange transformations, which is essentially like taking a piece of rope, cutting it into pieces and shuffling them together in a different order. The mathematics of cutting and reshuffling turns out to be complex, and recently reappeared in a new area of abstract algebra used in some theoretical physics models — “which was a really great surprise,” Dr. Kontsevich said.

The Breakthrough Prize in Mathematics is the latest effort in Mr. Milner’s crusade to make science lucrative and cool in a society that much more often celebrates athletes, entertainers, politicians and business tycoons.

“It is really out of balance,” he said. “This is really to emphasize the importance of fundamental science in our world today.”

A year after establishing the physics prize, [Mr. Milner orchestrated a similar prize for life sciences](#), attracting sponsorship from the families of Mr. Zuckerberg; Sergey Brin, a co-founder of Google; and Jack Ma, the founder of the Chinese e-commerce firm Alibaba.



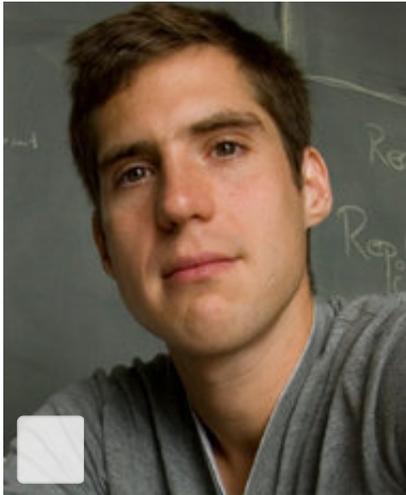
Terence Tao
BREAKTHROUGH PRIZE IN MATHEMATICS

The other winners of the math prize are [Simon Donaldson](#), 56, of Stony Brook University on Long Island and Imperial College London; [Jacob Lurie](#), 36, of Harvard; [Terence Tao](#), 38, of the University of California, Los Angeles; and [Richard Taylor](#), 52, of the Institute for Advanced Study in Princeton, N.J.

The accomplishments of Dr. Donaldson include using a mathematical theory originally developed for particle physics to study and classify possible shapes of four-dimensional space. Dr. Lurie was cited for cutting-edge advances in esoteric fields like “higher category theory” and “derived algebraic geometry.”

Dr. Tao has worked on fundamental problems involving prime numbers and has examined the equations of fluid flow, seeing if there might be solutions with black hole-like singularities where the fluid velocity turns infinite. Dr. Taylor, who first became known for helping [fill a gap in the proof of Fermat's Last Theorem](#), has mapped out unexpected connections between algebra and symmetries in geometry.

Three of the five — Dr. Donaldson, Dr. Kontsevich and Dr. Tao — are recipients of the [Fields Medal](#), probably the best known among mathematics awards. Dr. Tao has also received a MacArthur “genius” grant of half a million dollars.



Jacob Lurie
BREAKTHROUGH PRIZE IN MATHEMATICS

Dr. Tao said Mr. Milner came to his office at U.C.L.A. in January. Mr. Milner had already announced that he would establish the math prizes, and Dr. Tao thought Mr. Milner wanted advice on whom they should go to. Instead, Mr. Milner told him one prize was going to him.

Dr. Tao tried to talk Mr. Milner out of it, and suggested that more prizes of smaller amounts might be more effective in supporting mathematics. “The size of the award, I think it’s ridiculous,” he said. “I didn’t feel I was the most qualified for this prize.”

But Dr. Tao added: “It’s his money. He can do whatever he wants with it.”

Dr. Tao said he might use some of the prize money to help set up open-access mathematics journals, which would be available free to anyone, or for [large-scale collaborative online efforts](#) to solve important problems.



The other winners said they also intended to use some of the money to help support other mathematicians — except for Dr. Donaldson, who was the last to be contacted, not long ago. “I haven’t gotten as far as thinking about that,” he said.

Mr. Milner said that going forward, eight Breakthrough Prizes will be awarded each year: one in mathematics, one in physics and six in the life sciences, for a total payout of \$24 million. Past winners serve as committee members to choose future recipients.

Anyone can make a nomination for next year’s awards at breakthroughprize.org. The deadline is June 30.



Richard Taylor
BREAKTHROUGH PRIZE IN MATHEMATICS

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