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# Nobel laureates join world record juggler to win more converts to mathematics

**Tom Kington** in Rome
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John Nash, the Nobel prize-winning mathematician who fought schizophrenia and inspired a Hollywood biopic, can now take credit for doing something really hard - making Italians like maths.

The 79-year-old is back in Rome for the second edition of a maths festival that drew 60,000 visitors last year and is, according to organisers, fuelling a maths boom in Italy that has seen university applications double in two years.

At the four-day event which ends on Sunday, the man who heard imaginary voices for years and was played by Russell Crowe in A Beautiful Mind, heads a line-up including five Nobel winners as well as writers and musicians all seeking to explain in a lively way why art, business and music exist thanks to numbers.

"The idea of the festival is to present it in a more interesting way without dumbing things down," said Italian mathematician and festival director Piergiorgio Odifreddi.

Fellow mathematician Alfio Quarteroni will explain the mathematical secrets behind last year's America's Cup-winning yacht; Indian economist Amartya Sen is discussing the equations that govern famine; while Thomas Banchoff, a friend of Salvador Dalí, is outlining the fourth dimension in the artist's work.

World record juggler Allen Knutson is also revealing the computer programs he wrote to help him keep more balls in the air.

"I haven't met this juggler yet, and I'm really curious," said Nash over the shouts of schoolchildren lining up to enter the festival site to check out exhibits featuring tennis balls and soapy water bubbles, as well as complex games using pieces of pasta as counters that Nash admitted he had not fathomed.

After a huge screen needed to be erected outside the lecture halls last year to handle the overflow, this year young volunteers - easily mistaken for three card tricksters on Oxford Street - were wowing visitors outside the halls with scientific tricks.

Sitting in a bar outside the festival in the spring sun signing autographs, Nash said his introduction to science was more mundane. "I grew up with a basic chemistry set and a delightful model steam engine and I recall being impressed by my father's slide rule, which was made from wood and ivory and came in a leather case."

American physics Nobel winner and fellow speaker Sheldon Glashow said he owed his success to shooting pool when he was meant to be studying at university. "I will get on to talking about elementary particles at the festival but I also want to discuss how the mathematical implications of pool shots got me into physics."

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A few tables over from Nash at the bar, mathematician Stephen Smale admitted the maths bug bit late. "I failed a physics course in college and only switched to maths in the last year before nearly being kicked out of grad school. Back then in the 1950s I was into politics and a communist party member," said Smale, who will discuss his work on the mathematical modelling of the human visual cortex with a view to improving eye sight in robots.

"The best way to engage students is to simply ask them the questions that make them think," said Nash, whose speech on game theory will end the festival.

Opening proceedings on Thursday, writer Umberto Eco warned that numbers could do a lot, but could not explain everything, and he slammed conspiracy theorists who were "amazed" to find 11 letters in New York City and George W Bush, when the first plane to hit the twin towers on 911 was flight number 11. "Every time we want to attribute a significance to numbers that goes beyond what they are, it's a perverted use of mathematics," said the author.

**Balls in the air**

Putting a juggler on the podium alongside Nobel scientists including John Nash, at the Rome Maths festival may appear strange, but Allen Knutson is a pioneer in the use of computer programs to develop new, more complicated routines. The American was part of a wave of jugglers in the 1990s who gave each throw of a ball a number indicating the subsequent balls which will be thrown by the time it lands. "You end up with a string of numbers which allow you to plan moves that don't involve three balls coming down at the same time," he said.