

Prime promoter



Soccer player, musician and mathematician Marcus du Sautoy, a 2007 NZIMA Maclaurin Fellow, spoke with Jenny Rankine.

Marcus du Sautoy is 41 and bought a house at number 53 in a North London street. He can take the 19 or 73 bus to get there or drive his Primera 47. In 2003 when he was 37 he wrote a bestselling book which has been translated into 11 languages. All these numbers might tell you the subject - prime numbers - which he calls "the atoms of mathematics".

Despite buying his Sunday soccer team prime number t-shirts, he found it "freaky" that his subconscious had filled his life with so many primes.

Du Sautoy is that walking contradiction, a popular mathematician. He is a professor of mathematics at Oxford, and enjoys a media fellowship which enables him to spend half his time in the abstruse world of theoretical symmetry in infinite dimensions, and the other half popularising mathematics. This involves him in a bewildering array of media and collaborations.

He presents the BBC television program, Mind Games, where contestants solve mathematical and language problems. He has made short videos for school students; his four one-hour BBC maths history documentaries will go to air next year; he has a radio series and newspaper columns.

Num8er My5teries

In 2006 he scored the ultimate TV scientist slot - the Royal Institution Christmas Lectures - which drew over a million viewers. He called them The Num8er My5teries, about five of the Clay Mathematics Institute's Millenium Problems, and will repeat them in Australia in the near future. He collaborated on the play A Disappearing Number, about mathematicians Srinivasa Ramanujan and GH Hardy, which is touring the UK.

Du Sautoy has also worked with New Zealand dance choreographer Carol Brown and composer Dorothy Ker as part of the UK's burgeoning sci-art movement. "We combined maths, music, sculpture

and choreography to explore ideas of infinity and space." He finds these collaborations very stimulating: "they help me look at things in new ways."

He's enthusiastic about the drama behind his supposedly dry subject - his book *The Music of the Primes* is full of near escapes from death, love, betrayal and mad genius, proofs scribbled in margins and published from prison. When I meet him, he's wearing a purple soccer t-shirt with a prime number on the back and the equation describing the trajectory of a ball on the front. "Every time you catch or kick a ball, you're solving this quadratic equation," he says.

Du Sautoy describes the elation of discovering something first, which mathematicians crave for the rest of their careers. His discovery was a symmetry group. "Before I found it, it didn't seem to exist at all. Like an alchemist, I put things together in unexpected ways and pushed the subject in a new direction. Afterwards it felt like it had been lying there like a piece of gold waiting to be discovered."

His talent with metaphor is used to the full in his book *The Music of the Primes*, which describes the fiendishly complicated Riemann hypothesis in terms of harmony and landscape. Both the book and du Sautoy have fun websites. He has a new book coming out in early 2008 called *Finding Moonshine*, which tells the story of symmetry.

During his visit earlier this year, he spent a week with Ben Martin, a group theorist at the University of Canterbury. "A week's a short time, but we were able to connect very quickly." In the competitive world of elite mathematics, good collaborations are precious.

2 Du Sautoy works regularly with a German mathematician, Fritz Grunewald. "It feels like having two ladders, each with rungs missing so we can't climb further alone. As soon as we meet, everything fizzes. Often I'll be standing at a white board, grumbling, and he runs with it. Teasing out what's going on in non-verbal moments is as important as talking!"

1447 In Auckland du Sautoy lectured on the primes and made use of the computer skill of Auckland mathematicians on infinite groups. "It was fun doing computer experiments, it felt like being a scientist - I understood the groups a lot better."

19 He loves to overturn the popular misconception that maths research is long division to a lot of decimal places and that computers must have worked it all out by now. "Computers can help mathematicians generate data in their search for patterns; mathematicians have to try to show why the patterns will always work," he says.

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See also

www.musicofthepimes.com/ and www.maths.ox.ac.uk/~dusautoy/

For a free DVD of the Christmas Lectures: www.rigb.org/rmain/news/newsdetail.jsp?&comp=1&id=122&lang=EN

Videos on Teachers TV: www.teachers.tv/search/node/du+Sautoy

www.lms.ac.uk/activities/education_com/videos_purchase.html

A DVD of a BBC documentary presented by du Sautoy based on *The Music of the Primes* is available at www.ouw.co.uk/products/XM002_DVDSERIES.shtm