

Unravelling the beauty of mathematics

An insightful Q&A with Professor Marcus du Sautoy

- Professor Marcus du Sautoy has been long credited for his efforts to popularise and democratise science – particularly mathematics and related subjects.
- Here, he discusses his motivation for popularising mathematics and the balance between his academic research and public engagement, and explores the challenges and goals of democratising science.
- Emphasising the importance of informed decision-making on complex issues like artificial intelligence, energy, and even music, Professor Marcus du Sautoy has a wide-ranging array of expertise which he intends to share with the public.
- We were privileged to speak with Professor Marcus du Sautoy at this year's Cheltenham Science Festival to discuss his significant contributions to the mathematics of symmetry using number theory and the evolving tools and concepts in this field.

Professor Marcus du Sautoy, University of Oxford.



Professor Marcus du Sautoy is not just a renowned mathematician but a tireless advocate for the public understanding of science. As a professor at the University of Oxford, his work extends beyond academia into the realms of books, television, and radio, where he brings the beauty and complexity of mathematics to a broader audience. In this interview, conducted at Cheltenham Science Festival, we delve into his motivations, research, and the fascinating intersections between mathematics, artificial intelligence, and music.

What motivated you to take on your role as Simonyi Professor for the Public Understanding of Science, and how do you balance your academic research with your efforts to engage the public?

My journey into popularising mathematics began with a desire to share the beauty and excitement of mathematics with as many people as possible. Mathematics often has a reputation for being difficult and inaccessible, but I believe that with the right approach, its wonders can be appreciated by everyone. Balancing academic research with public engagement is indeed a challenge, but I see them as complementary. Communicating my research to a broader audience often gives me new insights and perspectives that feed back into my academic work. In my role as the Simonyi Professor for the Public Understanding of Science, I feel like an ambassador, bridging the gap between the scientific community and the general public to facilitate understanding and involvement in scientific debates that impact society.



Steve Backshall, Robin Ince, and Brian Cox during one of the many panel discussions at Cheltenham.



Du Sautoy specialises in bringing everyday concepts, objects, and materials to life.

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How do you address the challenge of democratising science, and what do you aim to achieve in this effort?

It's a tricky issue because there's no way that I can turn somebody into a scientist in one afternoon at Cheltenham Science Festival. So that's what's interesting about the role, that there is a kind of disparity there. Full democratisation is probably an impossible goal, but what you want to do is to try and give people as much information to be able to make informed decisions, because a lot of this will have political implications. They've got to decide, what do I want to do about stem cells? Should I be frightened about artificial intelligence? What are we going to do with our choices about how we generate our energy? My job, created in the mid-90s when Richard Dawkins was the first holder of the chair, would now likely be called something like Professor of Science and Society, emphasising a more equal exchange between science and the public.

Can you explain how your work on mathematics of symmetry using tools from number theory has evolved over the years and what you consider some of your most significant contributions to the field?

Symmetry is a central theme in my research, particularly its connections with number theory. Over the years, my work has evolved to encompass a broader range of tools and concepts, allowing for deeper exploration of symmetrical structures in mathematics. One of my significant contributions is the development of new frameworks for understanding symmetries in higher dimensions, which has implications for both theoretical mathematics and practical applications in fields like physics and engineering.

In your recent book 'The Creativity Code', you delve into the intersection of artificial intelligence and creativity. What are some of the most surprising or exciting developments you've encountered in



Interactive and tactile exhibits allow everyone at the Festival to experiment with science.



Making complex mathematical concepts accessible is all about storytelling.



The Festival attracts science enthusiasts from all stages in their education and careers.

One of the most surprising developments is AI's ability to generate original art, music, and literature that rivals human creativity.

this field, and how do you see Artificial Intelligence transforming our understanding of creativity in the future?

'The Creativity Code' explores how AI is pushing the boundaries of what we consider to be creative. One of the most surprising developments is AI's ability to generate original art, music, and literature that rivals human creativity. This challenges our traditional notions of creativity and raises fascinating questions about the nature of human and machine intelligence. In the future, I believe AI will become a powerful collaborator in creative processes, offering new tools and perspectives that can enhance human creativity.

As co-director of PRiSM at the Royal Northern College of Music, you explore the connections between science and music. How did this initiative start, and what are some of the most intriguing projects or findings that have emerged from this collaboration?

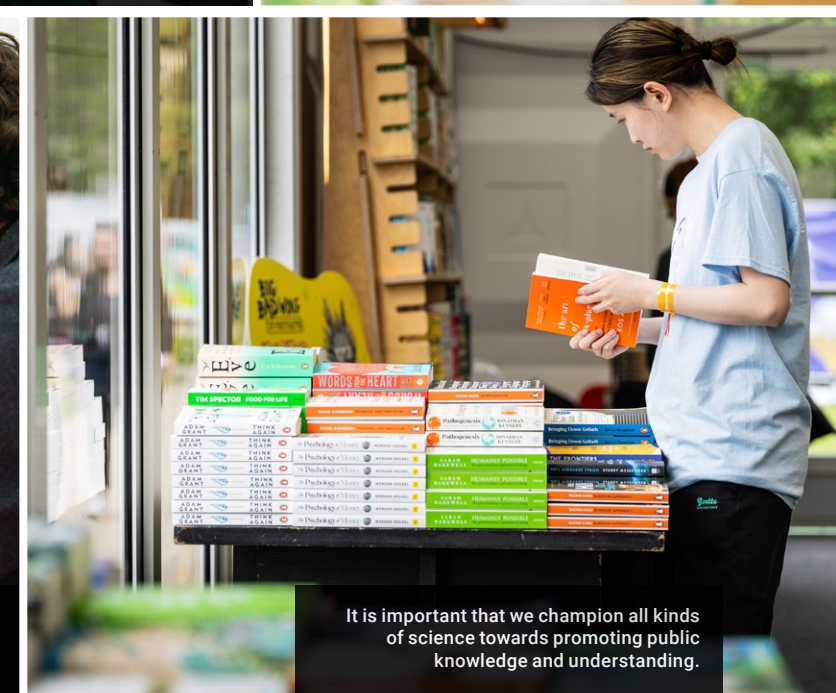
Music is one of my great passions. There was a point when I was younger where I had to choose between a musical direction or a



Du Sautoy's responsibility lies in translating complex scientific ideas into accessible narratives.



Gaming, crafts, and even tea bags are capable of demonstrating science in engaging ways.



It is important that we champion all kinds of science towards promoting public knowledge and understanding.

mathematical one. I realised being a musician is hard work, with many hours of practice, but I have maintained a strong interest in music, which has formed part of my professional career. Mathematics and music are deeply connected through the idea of patterns. I have used music as a platform to involve people in mathematical ideas, as a lot of music has mathematical structures hidden inside them. This led to setting up PRiSM (Practice and Research in Science and Music) at the Royal Northern College of Music, exploring the collaboration between musical composition and scientific ideas.

How do you approach making complex mathematical concepts accessible and engaging for a general audience, and what challenges have you faced in this endeavour?

Making complex mathematical concepts accessible is all about storytelling. I try to find narratives and analogies that resonate with everyday experiences, making abstract ideas more tangible. One of the biggest challenges is overcoming the initial resistance many people have towards mathematics due to past experiences or preconceived notions. By presenting mathematics as a dynamic and integral part of our world, I aim to spark curiosity and open minds to its possibilities.

Given your role in engaging the public with science, how have you found Cheltenham Science Festival over the years?

I've been involved with the Festival for years, since around 2006. It's interesting to see how the Festival has changed, becoming incredibly vibrant. The range of events illustrates the breadth of topics the

Festival tackles, from musical interpretations of planets beyond our solar system to the science of deception. The Festival's approach of blending different disciplines is something I resonate with, as I use similar strategies to make complex mathematical stories accessible by relating them to everyday experiences.

Professor du Sautoy's work exemplifies the intersection of rigorous academic research and passionate public engagement. His efforts to demystify mathematics have not only broadened the public's understanding, but also enriched the field itself. As we continue to navigate the evolving landscape of science and creativity, his insights remind us of the boundless potential that lies at the intersection of knowledge and imagination.

Interview conducted by Todd Beanlands
todd@researchfeatures.com

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e: marcus.dusautoy@maths.ox.ac.uk
 X: [@marcusdusautoy](https://twitter.com/marcusdusautoy)