

Members of the Faculty, Ladies and Gentlemen, I am very happy to welcome you to the 54th Pauli lectures. The lecture series is named after Wolfgang Pauli who was Professor of Physics at ETH Zurich from 1928 until his death in 1958. Pauli made great contributions to the development of Quantum Mechanics. He was awarded the Nobel Prize in 1945 for his famous Pauli Exclusion Principle.

By tradition, the Pauli lectures rotate among the disciplines of biology, physics, and mathematics. It is our great fortune this year to have Professor Timothy Gowers of Cambridge University as our speaker in Mathematics.

Gowers completed his PhD in 1990 at Cambridge. His early work concerned very original constructions of Banach spaces with strange and surprising properties. The great Polish mathematician Stefan Banach worked in the 1920s and 30s in Lvov. He was known for avoiding his office and spending his working days in a cafe called the Scottish Cafe. There, with his mathematical circle, which included luminaries such as Stanislaw Ulam, many aspects of the theory of Banach spaces were discussed and developed. A famous book emerged, called the Scottish book, from these cafe discussions. The book contained a wealth of results, ideas, and open questions. Gowers used his new constructions to settle several problems in the Scottish book that had been open since Banach's cafe days. Gowers was awarded the Fields Medal for this work in 1998 and was appointed Rouse Ball Professor of Mathematics at Cambridge in the same year, a position that he continues to hold today.

To give a flavor of his work, I will take the liberty here of saying one technical sentence: Gowers constructed a Banach space X which is not isomorphic to X direct sum X , but which is isomorphic to the direct sum of three copies of X . This is an example of the strange behavior that he found.

More recently, he has also worked in directions including combinatorics, number theory, graph theory about which we will hear. Gowers has received many academic honors, and, in 2012, he was knighted by the Queen of England for his service to Mathematics.

We are very happy today to have him here to present his first Pauli lecture with the intriguing title "Why isn't mathematical research impossible?".

[RP, 12 December 2018]