Frontiers

The Banach-Tarski paradox and von Neumann's concept of amenability

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Banach and Tarski proved in 1924 that it is possible to cut a ball into five pieces and to reassemble these pieces by rotation and translation into two balls of the same radius. At the same time, there is no such paradoxical decomposition of the two dimensional disc. I will sketch a proof of this result using key ideas of von Neumann about the qualitatively very different behavior of the symmetries of the two-dimensional plane compared to the symmetries of the three-dimensional space. I will also present more recent striking applications of these ideas throughout mathematics.

Tuesday 16 May 2017   Time: 17.00
Council Chamber
Main Building, Cardiff University

The distinguished lecture is aimed at a broad spectrum of scientists interested in the frontiers of mathematical research with applications and roots in theoretical physics and the other sciences. The event is open to anyone, with a tea in the Council Chamber from 16.30, followed by a wine reception after the talk. For further information Professor David Evans, EvansDE@cf.ac.uk, Cardiff School of Mathematics.

Stefaan Vaes was awarded the Franqui Prize in 2015, the Prize Vlaamse Wetenschappelijke Stichting of the Royal Flemish Academy of Belgium for Science and the Arts in 2012, the Lucien Godeaux Prize of the Royal Society of Sciences in Liège in 2006. He is currently the Rothschild Distinguished Visiting Fellow at the Isaac Newton Institute, Cambridge, and has previously held the Francqui Chair at the VUB, Brussels in 2016 and the Peccot Chair at the Collège de France, Paris in 2005.