

Press release

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Fields Medal awarded to ETH Zurich mathematician

Alessio Figalli wins the “Nobel Prize of Mathematics”

Zurich, 1 August 2018

Alessio Figalli, Professor of Mathematics at ETH Zurich, was awarded the Fields Medal today for his outstanding contribution to mathematical research. The medal is to mathematics what the Nobel Prize is to natural sciences.

This is a great honour for Alessio Figalli, a mathematics professor at ETH Zurich since 2016. The International Mathematical Union (IMU) awarded the Fields Medal to the Italian citizen today at the International Congress of Mathematicians 2018 (ICM 2018) in Rio de Janeiro. The Fields Medal is the most prestigious award in the field of mathematics.

Optimal transport – even in nature

The IMU conferred the award on Alessio Figalli for his contributions to the theory of optimal transport and its applications in partial differential equations, metric geometry, and probability. Amongst several contributions, he solved a problem dating back over 20 years involving the so-called Monge-Ampère equation, a famous partial differential equation that was introduced in the 19th century and is now applied in many different areas, including urban planning, imaging and meteorology. The rationale behind the equation is that total transport costs need to be kept as low as possible. This also applies to many change processes in nature: for example soap bubbles and crystals attain their attractive geometric shape by minimising surface energy. Alessio Figalli has mathematically proven that the abrupt changes in cloud formations in major weather fronts can be broken down into optimal transport equations. When the clouds change shape, the particles move in an optimal, energy-efficient way from their initial state to another.

Mathematics is creative

At just 34 years of age, the mathematician already has a distinguished CV. He completed his doctorate in 2007 after just one year. He was appointed Associate Professor at the University of Texas at Austin at the age of 25, and promoted to Full Professor at the age of 27. Then he joined ETH Zurich

as Full Professor when he was 32. He has also received numerous awards and distinctions and the Fields Medal represents the high point of his career to date. Alessio Figalli is naturally delighted: “Receiving the Fields Medal is a great honour. The medal expresses great recognition not only for my research but also for the entire scientific community of analysis. Personally, I feel a deep satisfaction that motivates me even more to get involved in top-level research.” He is convinced that creativity is the key to devising new tools and techniques to solve mathematical questions. “It's great to be the first to prove something that has occupied many mathematicians for years”, says Alessio Figalli, “I'd like to show young talented people how creative and exciting mathematics really is. The vibrant and dynamic setting I have here at ETH Zurich is the perfect place to do that.”

An ambassador for mathematics

“It fills me with pride that a researcher at ETH Zurich has been awarded one of the highest honours in academia. I have come to know Alessio Figalli as an extremely creative mathematician and an open, communicative person”, says ETH President Lino Guzzella, “I am convinced that he is a major asset to our teaching and research at ETH Zurich and for Switzerland as a research centre. He can also make an impact as an ambassador for mathematics.”

Further information

Fields Medal winner Alessio Figalli is currently at the International Congress of Mathematicians ICM 2018 in Rio de Janeiro. He can be contacted via his e-mail address.

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The Fields Medal

The Fields Medal is the top academic award for mathematicians and equivalent to the Nobel Prize for natural sciences. It is awarded in recognition of an outstanding mathematical discovery made before the age of 40. The Fields Medal, unlike the Nobel Prize, is only awarded every four years to between two and four mathematicians. It is conferred by the International Mathematical Union (IMU) at the International Congress of Mathematicians (ICM). This year, the congress is being held in Brazil in beginning of August. The medal comes with CAD 15,000 in prize money. Wendelin Werner, who has been conducting research and teaching at ETH Zurich since 2013, was also awarded the Fields Medal in 2006.