

Imperial College London: Hayley Dunning, January 9, 2019

## **Black-hole mathematician wins exceptional young scientist award**

Imperial's Professor Gustav Holzegel is a Finalist in the second annual Blavatnik Awards in the UK, winning US\$30,000.

The [Blavatnik Awards](#) are the largest unrestricted cash prizes available exclusively to young scientists and engineers in the UK under the age of 42.

[Professor Holzegel](#), from the Department of Mathematics at Imperial, is cited for developing rigorous mathematical proofs of physics questions related to Einstein's general theory of relativity.

In particular, his work to address the question of what would happen after a massive black hole is shaken (or 'perturbed'), known as the 'black hole stability conjecture'. The conjecture predicted that the black hole would eventually settle down into a stable form much like the one it began in, in the same way that a block of jelly will return to its original shape after being prodded. However, this remained unproven for many decades, even for the simplest black hole.

In 2016, Professor Holzegel and his collaborators first proved a version of the conjecture for simple black holes – those with a spherical shape and without rotation or net electric charge. His follow-up work has led towards a more complete solution to the black hole stability conjecture that would apply to all complicated types of black holes.

Professor Holzegel has also worked in other areas of the theory of general relativity, for example producing a series of papers on Einstein's field equations that have important implications in string theory and particle physics.

### **Pushing the frontiers of our understanding of the universe**

In its citation, the Blavatnik Awards state that 'Professor Holzegel has pushed the frontiers of our understanding of the universe as outlined by the general relativity theory'.

On winning the award, Professor Holzegel said: "I am delighted to receive this prize and I would like to thank my collaborators without whom this would not have been possible."

Sir Leonard Blavatnik, Founder and Chairman of Access Industries, head of the Blavatnik Family Foundation, and member of the President's Council of the New York Academy of Sciences, said: "Recognising and encouraging the brilliant talent of the UK's best young scientists through the Blavatnik Awards is our honour.

"By supporting young scientists as they embark on their careers, we create a positive impact on the country's future prosperity, accelerating scientific discovery and innovation that mankind can benefit from, and encouraging others to follow their path."

The 2019 Blavatnik Awards Laureates and Finalists in the UK will be honoured at ceremony at the Victoria and Albert Museum in London on 6 March 2019. The following day the honourees

will present their research in a public symposium entitled [Cure, Create, Innovate: 9 Young Scientists Transforming Our World](#) to be held at the Science Museum, London on 7 March 2019.

<https://www.imperial.ac.uk/news/189728/black-hole-mathematician-wins-exceptional-young-scientist/>