Centre for Strings, Gravitation and Cosmology presents

CHANDRASEKHAR LECTURE

BLACK HOLES AND QUANTUM SPACETIME

Professor Jerome Gauntlett

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Black holes are structures in the fabric of spacetime and are amongst the most extraordinary objects known to exist in the universe. In addition to their astrophysical significance, black holes also provide profound clues in the ongoing quest of constructing a theory of quantum gravity that unifies Einstein's theory of General Relativity with the quantum laws of physics. Developments in string theory, a most promising framework for quantum gravity, have illuminated our understanding of the quantum properties of black holes and the nature of quantum spacetime. The goal of the talk is to give a flavour of some of these striking theoretical developments.

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Jerome Gauntlett completed his undergraduate studies at the University of Western Australia in 1986, before completing his Ph.D. at DAMTP, University of Cambridge in 1991. Following his postgraduate studies he held postdoctoral positions at the University of Chicago and then at Caltech. He joined the faculty at Queen Mary, University of London in 1996 and then moved to Imperial College in 2003. From 2011-2016 he was Head of the Theoretical Physics Group. Since 2014 he has held a Visiting Fellowship at the Perimeter Institute in Waterloo, Canada and from 2015-2021 he was a KIAS Scholar at the Korean Institute for Advanced Study in Seoul, Korea. During his career, Gauntlett has received several awards including an EPSRC Advanced Fellowship (2004-2009), a Royal Society Wolfson Merit Award (2006-2012), an EPSRC Senior Fellowship (2006-2011) and an ERC Advanced Grant (2014-2019). He was elected as a Fellow of the Institute of Physics (IoP) in 2004, and the IoP awarded him the Lord Rayleigh Medal and Prize in 2021. Gauntlett has made significant contributions to string theory, particularly at the intersections with quantum field theory and black hole physics, and also to its rich mathematical structure. Recently he has made important contributions to the interdisciplinary area of applications of string theory to condensed matter physics. He is an editor of the Journal of High Energy Physics. Gauntlett has also been very active in outreach and public engagement. He was the Theoretical Physics Consultant for the Oscar winning film "The Theory of Everything" about Stephen Hawking. He has also given many public talks including at the Science Museum and the Royal Institution in London.

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