

# “Black holes at the LHC”

*Free Public Lecture at the Wollongong Science Centre,  
Squires Way, Fairy Meadow, 7 pm, Thursday, 5<sup>th</sup> August 2010*



**ABSTRACT:** Brane world models in string theory suggest that our universe is a slice, or ‘brane’, of a higher-dimensional space-time. One consequence of these models is that the fundamental energy scale of quantum gravity may be within reach of current particle physics experiments. In particular, copious numbers of mini black holes may be formed by collisions at the Large Hadron Collider (LHC) at CERN. In this talk we will review recent research on the formation and subsequent evaporation of these mini-black holes. We focus on the experimental signatures of these processes and discuss existing experimental bounds on black hole production.

**Speaker Background:** Professor Elizabeth Winstanley has been awarded the AIP Women in Physics Lectureship for 2010. The *Australian Institute of Physics Women in Physics Lecture Tour* celebrates the contribution of women to advances in physics. Under this scheme, a woman who has made a significant contribution in a field of physics will give a series of public lectures around Australia.

Elizabeth Winstanley is a Professor of Mathematical Physics at the University of Sheffield, UK. Her research interests lie in general relativity, quantum gravity and quantum field theory in curved space-time. Her research focuses on the physics of black holes, particularly “hairy” (and more recently, “furry”) black holes in general relativity and the Hawking radiation of black holes as might be produced at the Large Hadron Collider at CERN in Switzerland. The latter topic will form the basis of many of her lectures in Australia. She maintains a keen interest in developments in mathematics and science education, serving on a number of national mathematics education committees in the UK. She is a past-chair of the Gravitational Physics Group of the UK Institute of Physics and has recently been a member of the Council of the London Mathematical Society, the UK’s learned society for mathematics.

Elizabeth Winstanley was born in Wigan, Lancashire and was educated at Abbey Gate College near Chester, both in the north of England. At school she harboured an ambition to be Governor of the Bank of England, but her academic interests lay in physics and mathematics. She decided to study mathematics at university, and obtained an MA in mathematics from St. Hugh's College, Oxford University. By now she had changed her mind about becoming Governor of the Bank of England, and wished to study physics further, completing a DPhil in theoretical physics at Oxford in 1996. After her doctoral studies, she was appointed as Fellow and Lecturer in Applied Mathematics at Oriel College, Oxford University, teaching a wide range of mathematics and theoretical physics courses. In September 2000, she was appointed as a Lecturer in the Department of Applied Mathematics at the University of Sheffield, where she has worked ever since. She has worked her way up the academic ladder at Sheffield, and was promoted to Professor of Mathematical Physics in January 2009.

Apart from physics, she enjoys watching sport, particularly cricket and rugby league, and has a broad taste in music, everything from Rachmaninov to Radiohead.



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