



Joint Colloquium

Chin-Yu Scholars Lecture

NTU-Phys, NTNU-Phys, LeCosPA, IAMS, CCMS, ASIAA, and NTU-CTP

What Can QFT Teach Us about Black Holes (and Vice Versa)?

Prof. Nicholas Dorey

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Time:

Dec. 12, 2023 at 14:20

Venue:

Chin-Pao Yang Lecture Hall (R104)

Abstract

The existence of black holes is a remarkable prediction of Einstein's General Theory of Relativity. The prediction was spectacularly confirmed by the detection at LIGO in 2015 of the gravitational waves emitted by a black hole merger. Despite this, the status of black holes in a more complete description of our universe including quantum mechanics has long remained mysterious, presenting puzzles for theorists which still remain unsolved.

The AdS/CFT Correspondence is a "holographic" duality between gravity and quantum field theory (QFT) which has provided new tools for studying the physics of black holes. It has also led to progress in understanding the behaviour of QFT at strong coupling.

In my talk, I will review the correspondence and some of the insights it has provided. I will also discuss the future prospects for resolving some of the hardest outstanding questions.

Biography

Professor Nicholas Dorey is a world expert working in the gauge field theories and string theory. He is particularly interested supersymmetric gauge theories and their remarkable duality properties. He has done several important work in multi-instanton calculus in fields and string theory, the exact results from supersymmetric gauge theories using matrix models, and his recent work focuses on the emergence of integrability, both in gauge theory and string theory, also in the context of AdS/CFT correspondence. After obtaining PhD from University of Edinburgh in 1991, Professor Dorey has held positions at Los Alamos National Laboratory (1991-1993), Swansea University (1993-2004), and moved to University of Cambridge in 2004, where he became full professor in 2007. He was the winner of 2003 Whitehead Prize award by London Mathematical Society, and formerly the head of high energy theory group at DAMTP, University of Cambridge.