Lecture Series by Professor Frederik G. Scholtz

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About the Speaker

Professor Frederik G. Scholtz is a prominent South African physicist and currently holds the position of Director in the National Institute of Theoretical Physics (NITheP), since its inception in the year 2008. He got his Ph.D. in theoretical physics from Stellenbosch University in 1986 and thereafter had a post doctoral position in Germany as a Von Humboldt fellow. He joined the faculty of Stellenbosch University at 1993 and became head of the physics department in 2006. He got several awards in recognition of his work in theoretical physics, which includes the silver medal of the South African Institute of Physics and the President award of the National Research Foundation (NRF). His current interest focuses on Non-commutative quantum mechanics and quantum field theory.

An Introduction to Non-commutative Quantum Mechanics

Lecture 1: 3:00 pm at Fermion Hall on February 19, 2019

Title: Quantum mechanics on the Moyal plane

Abstract: In this lecture, I introduce the basic formalism of non-commutative quantum mechanics within the context of the Moyal plane. It is emphasized that non-commutative quantum mechanics requires no new conceptual framework and that it fits completely within the standard axioms of quantum mechanics. In particular the notion of the quantum Hilbert space, observables and position measurement are carefully discussed. Elementary applications are also discussed.

Lecture 2: 3:00 pm at Fermion Hall on February 20, 2019

Title: Quantum mechanics on 3-dimensional fuzzy space

Abstract: In this lecture, I develop the concepts of lecture one further in the context of 3-dimensional fuzzy space, which respects rotational symmetry. The physical consequences of non-commutativity are emphasized through elementary applications.

Lecture 3: 10:30 am at Fermion Hall on February 21, 2019

Title: Advanced applications

Abstract: This lecture covers more advanced applications of the formalism developed in lectures one and two. In particular, the physical consequences of non-commutativity are emphasized.