



NITheP cordially invites you to a seminar by

Professor George Ellis

University of Cape Town

Date: Friday, 26th October 2018

Time: 11h30 -12h30

Venue: NITheP Seminar Room, 3rd Floor, H-Block

Title: Contextual Wavefunction Collapse: An integrated theory of quantum measurement

Abstract: This paper is an in depth implementation of the proposal [1] that the quantum measurement issue can be resolved by carefully looking at top-down contextual effects within realistic measurement contexts. The specific setup of the measurement apparatus determines the possible events that can take place. The interaction of local heat baths with a quantum system plays a key role in the process. In contrast to the usual attempts to explain quantum measurement by decoherence, we argue that the heat bath follows unitary time evolution only over limited length and time scales [2] and thus leads to localization and stochastic dynamics of quantum particles that interact with it. We show furthermore that a theory that describes all the steps from the initial arrival of the quantum particle to the final pointer deflection must use elements from classical physics. This proposal also provides a contextual answer to the puzzle of the origin of the arrow of time when quantum measurements take place: it derives from the cosmological Direction of Time. Overall, our proposal is for Contextual Wavefunction Collapse (CWC).