ICTS Colloquium

Title : Chance in a Branching World

Speaker : Tarun Menon, Tata Institute of Social Sciences, Mumbai

Date : Monday, July 16, 2018

Time : 4:00 PM

Venue : Emmy Noether Seminar Room, ICTS Campus, Bangalore

Abstract : The Everett or Many-Worlds interpretation of quantum mechanics treats quantum physics as entirely deterministic – there are no fundamental chances in the theory, nor is there any necessary uncertainty about the states of systems. Yet our empirical evidence for quantum theory seems to be probabilistic, and the theory itself assigns probabilities to various outcomes based on the Born Rule. How do we make sense of a probabilistic theory without any randomness or uncertainty about physical states? I argue that a subject naturalist position – one that understands observers themselves from the perspective of the theory – can make sense of the probabilistic nature of quantum mechanics under the Everett interpretation. In fact, even better, it offers the prospect of a derivation of the Born Rule from the symmetries of quantum theory and certain assumptions about how quantum observers should make decisions. I explore two alternative understandings of the probabilities in the Everett interpretation – as parameters governing a rational agent's decision-making algorithm, and as uncertainty that an agent has about their own location in the universe.