



Contribution ID: 7

Type: **Talk**

Aspects of time in quantum mechanics

Wednesday, 25 May 2022 11:00 (1 hour)

Time in quantum mechanics, especially the non-relativistic theory has privileged position in that unlike the Cartesian coordinates it is a parameter rather than an operator. Moreover, it is a parameter over which we have no control: time passes and our quantum systems evolve. Yet the theory is essentially time-symmetric (as is most of the rest of physics) so there is a sense in which “time-reversed” quantum theory should have a meaning. This is indeed the case and I shall present such a retrodictive (as opposed to predictive) theory, which is linked to the conventional approach by Bayes’ theorem. The theory brings with it surprises, some of which I shall demonstrate. These include unconventional explanations for classic quantum optics experiments and novel devices designed using retrodictive reasoning including the possibility of information processing in the past! If time permits I shall also introduce the principle of devices utilising indefinite causal order, in which there is an advantage to be had by employing physical operations in a superposition of temporal orders.

Primary author: Prof. BARNETT, Stephen M. (School of Physics and Astronomy, University of Glasgow)

Presenter: Prof. BARNETT, Stephen M. (School of Physics and Astronomy, University of Glasgow)

Session Classification: Talk