



The Rutherford Appleton Laboratory Lecture

27th September 2012

R22 LECTURE THEATRE – 15:00

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From Newton to Turing: Physics and the Computational Constraint

Alan Turing's interest in computability was basic, both in its approach to questions about the real world, and in the nature of his mathematics.

Until the twentieth century, science has been increasingly ruled by a computational paradigm going back to Newton and before. Turing was part of a radically new engagement with physical, mental and mathematical phenomena which stretched our conceptual and heuristic frameworks. This talk presents a centennial review of Turing's work in clarifying the nature of the computational world and understanding our everyday efforts to predict and compute.

In what way does the world (and within that the human mind) compute differently to the universal Turing machine? In what sense does the world compute at all? What is the real significance of randomness and incomputability? What opportunities and problems does natural embodiment of computation present? Can we rebuild today's fractured relationship between mathematics and everyday experience? Throughout his life, Alan Turing thought about such questions, and lifted his gaze towards the incomputable. Of course, one can fly too close. Undredictability may be more than just mathematics.

Coffee, tea and biscuits at 14:30 in R22