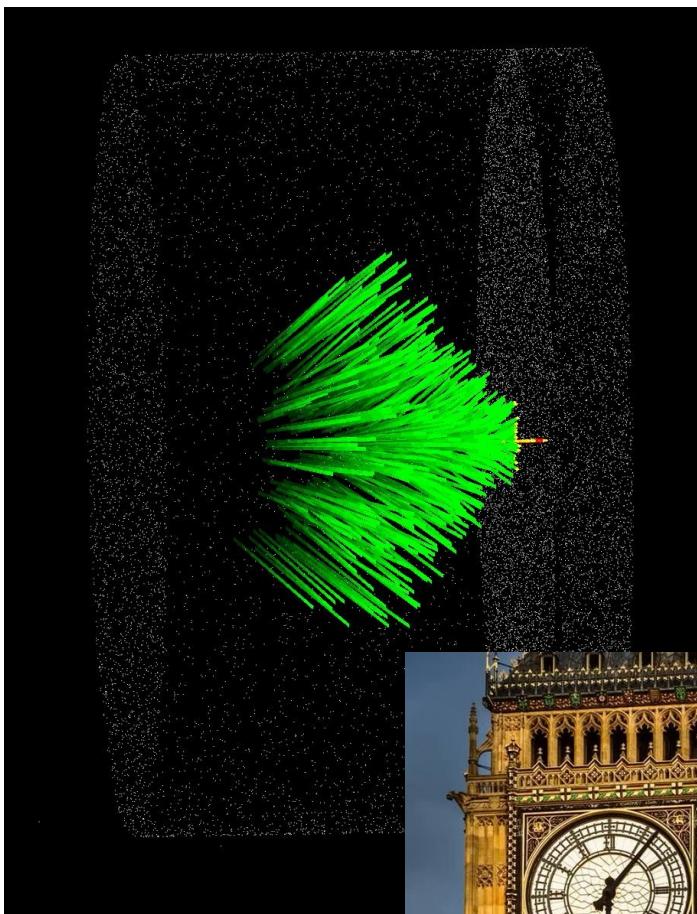


What Time is it?

Towards detectors with picosecond-level timing precision

Prof. Roger Rusack (University of Minnesota)



It has long been recognized that precision timing in particle and nuclear physics opens new directions in physics. Going back to the earliest experiments in particle physics timing in detectors has been used to measure time-of-flight, for particle identification and for precision positions measurements. Forty years ago, the state-of-the-art was 250 picoseconds. Modern detectors with a resolution of 30 picoseconds are being built for the CERN High-Luminosity Large Hadron Collider To move from where we are now to an even more precise level of timing measurement there are many technological challenges including broadcasting a time signal. In my talk I shall review how time has been broadcast in the past, the current solutions and discuss ideas on how to achieve a timing precision in large detector systems around one picosecond.



Prof Rusack has worked on the design, construction and exploitation of particle physics detectors at CERN and at Fermilab since he graduated from Imperial College. In his career he has designed detectors for fixed-target, collider and neutrino experiments. He has been an author on three particle first observation papers: the tau neutrino, the Higgs boson and the $^1h_c^1$ meson. He is currently working on a measurement of the Higgs boson mass and investigating the limits of clock distribution.

13 February
4 p.m.

TIFR Lecture Theatre AG66

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