

## **Maik Reddiger: A solution of the time of arrival problem via mathematical probability theory**

*Friday, May 8, 2026 1:50 PM (30 minutes)*

Time of arrival refers to the time a particle takes after emission to impinge upon a suitably idealized detector surface. Within quantum theory, no generally accepted solution exists to date for the corresponding probability distribution of arrival times. Here I derive a general solution for a single body without spin impacting on a perfectly absorbing detector in the absence of any other forces or obstacles. In dynamical terms, the presence of the detector requires a modification of the Schrödinger equation. This guarantees that the probability flux through the detector surface is always positive, so that the arrival time distribution can be derived via an approach originally suggested by Daumer, Dürr, Goldstein, and Zanghi. The key innovation of this work is the explicit reliance on mathematical probability theory rather than more conventional quantum-mechanical concepts of probability. If time permits, I will also provide a simple, analytical example for a spherical detector. This talk is based on R., *Philos. Mag.* (2026). DOI: 10.1080/14786435.2026.2627725