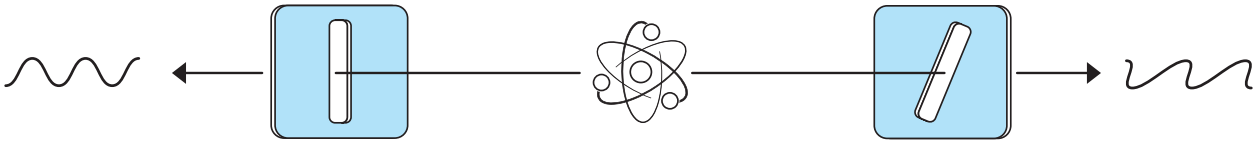
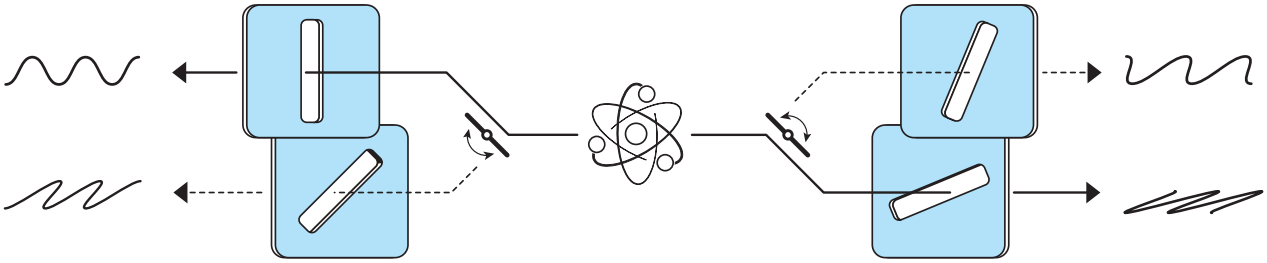
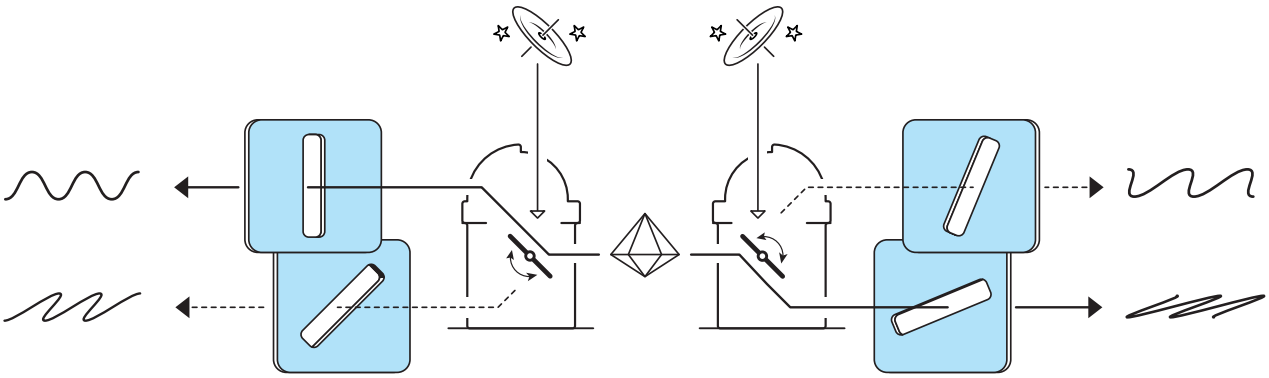
Experimenting with Bell inequalities



John Clauser used calcium atoms that could emit entangled photons after he had illuminated them with a special light. He set up a filter on either side to measure the photons' polarisation. After a series of measurements, he was able to show they violated a Bell inequality.



Alain Aspect developed this experiment, using a new way of exciting the atoms so they emitted entangled photons at a higher rate. He could also switch between different settings, so the system would not contain any advance information that could affect the results.



Anton Zeilinger later conducted more tests of Bell inequalities. He created entangled pairs of photons by shining a laser on a special crystal, and used random numbers to shift between measurement settings. One experiment used signals from distant galaxies to control the filters and ensure the signals could not affect each other.

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