

Question-List “Experimental Quantum Teleportation”, Nature 390, 575 (1997)

Presenter – 10 min:

Sketch the key results. (Maybe use 1 Formula + 2 Figures, max. 3 Slides!).

Also: Bibliometrics: what do you know about the authors and impact of the paper?
Based on the bibliometrics, do you think the paper is a milestone?

Question List Groups:

1. Why can one not measure a quantum state and then send the information classically and then reconstruct it?
2. Who called entanglement “THE essential feature of quantum mechanics “?
3. How many particles could be entangled experimentally prior to the paper?
4. What reasons could Alice have to not send her state directly to Bob?
5. Which photon degree-of-freedom is used here? Which other degree-of-freedom could also be used?
6. Which quantum postulate is used in the teleportation protocol? What does it mean?
7. What main ingredients are needed in the teleportation protocol? How many photons are necessary.
8. How many photons are used in the experiment, and what is the role of photon 4?
9. What is “spooky action at a distance”?
10. How many Bell-states are there, how many are detected by the experiment, how?
11. What is the no-cloning theorem and how is it circumvented by teleportation?
12. How is polarization entanglement produced in the experiment?
13. What is special about the ϕ - state?
14. For which states was teleportation demonstrated, and why is this sufficient?
15. What are “spurious coincidences” and where do they come from?
16. Estimate the measurement time for the data in fig. 4!
17. What happens when you teleport the state of a photon that is already entangled to another photon?