

### **27.1. Single-Photon-Level Quantum Memory at Room Temperature**

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*Phys. Rev. Lett.* **107**, 053603 (2011) (J.Wolters)

#### **Presenter (10 min):**

Sketch the key idea and result (3 slides max).

Define the term „quantum memory“

Sketch the experimental setup and level scheme

Bibliometrics: What do you know about the authors?

Is the paper a milestone?

1. Which applications of quantum memories can you imagine?
2. Why are quantum memories needed for quantum repeaters? Maybe take a look at Physics Viewpoint: [A long-distance quantum repeater gets one step closer](#)
3. What are the key requirements on quantum memories?
4. What exactly is the claim of the paper?
5. Which systems are alternatively proposed for quantum memories? What are their pros/cons?
6. What is the physical mechanism behind the storage/retrieval process?
7. What is meant by the term “atomic spin-wave excitation”?
8. What is the experimental key challenge?
9. What is the unconditional noise floor? Estimate the signal to noise level achievable when using the memory to store true single photons!
10. Which noise sources are identified in the paper?