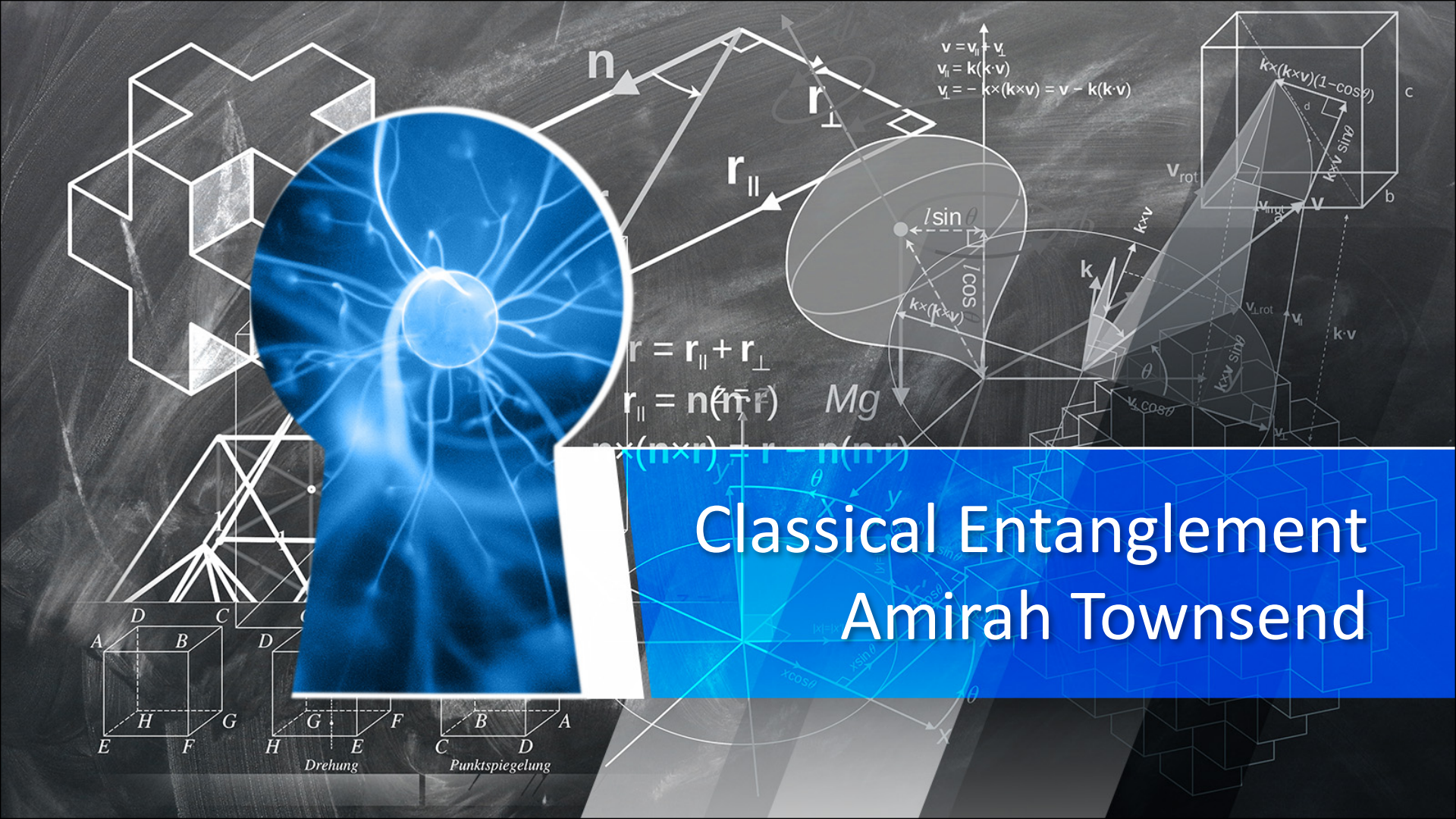
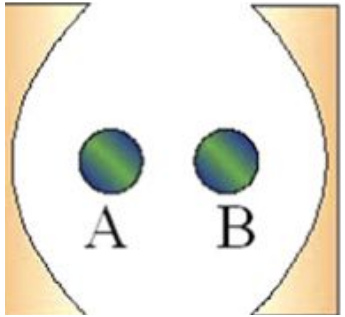
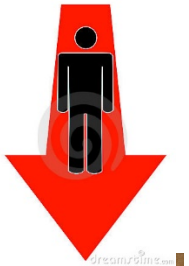

Classical Entanglement
Amirah Townsend

What is Quantum entanglement?

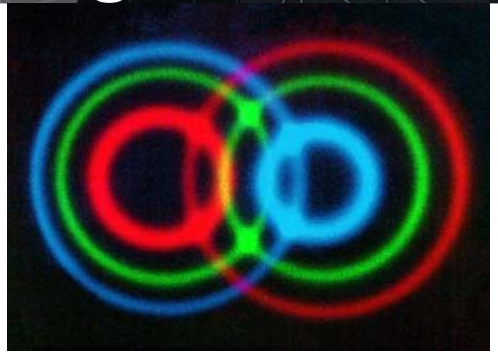
- Take two separate atoms



- They can be either spin up or spin down



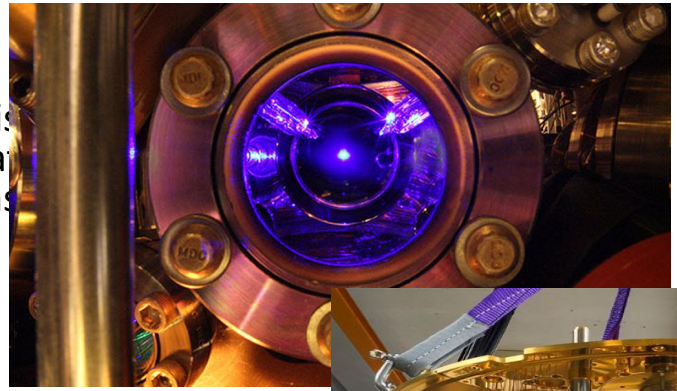
- To entangle them, or combine them each becomes a superposition of up and down

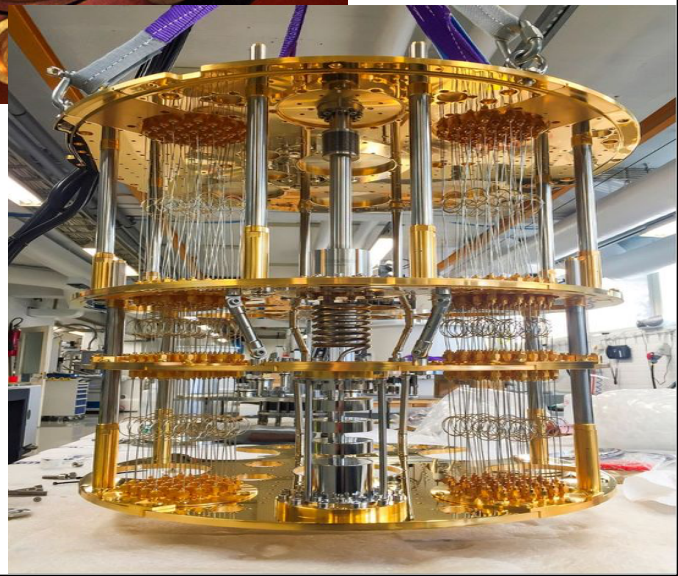


- For the two atoms: one MUST be spin up and the other MUST be spin down

Quantum Entanglement Important

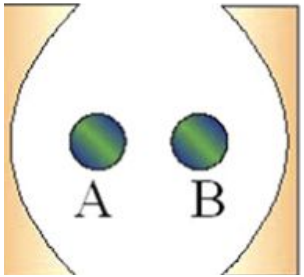
- Quantum entanglement is used to develop tools that make real world problems easier to solve
- Ex: Strontium Clock, Quantum Computer
- But this can be very expensive!!!!! Companies spending billions just on quantum computer.
- However, it is possible to create entanglement in a classical system.



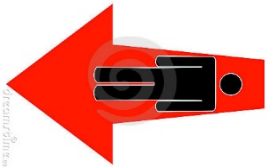


How does this classical experiment play a role?

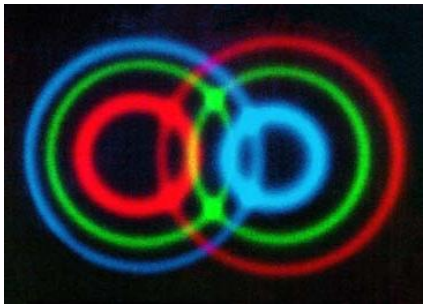
- You have two different light modes



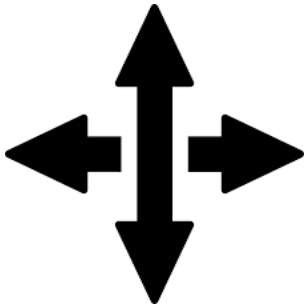
- With either a vertical polarization or a horizontal polarization

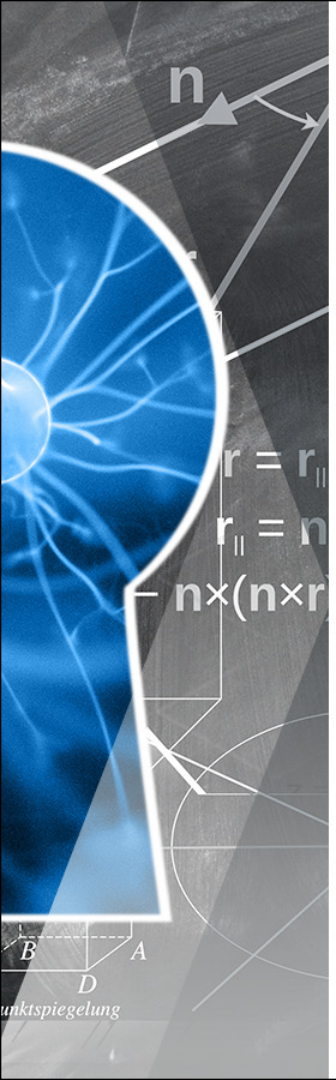


- After measuring one they become entangled and each is a superposition of horizontal or vertical



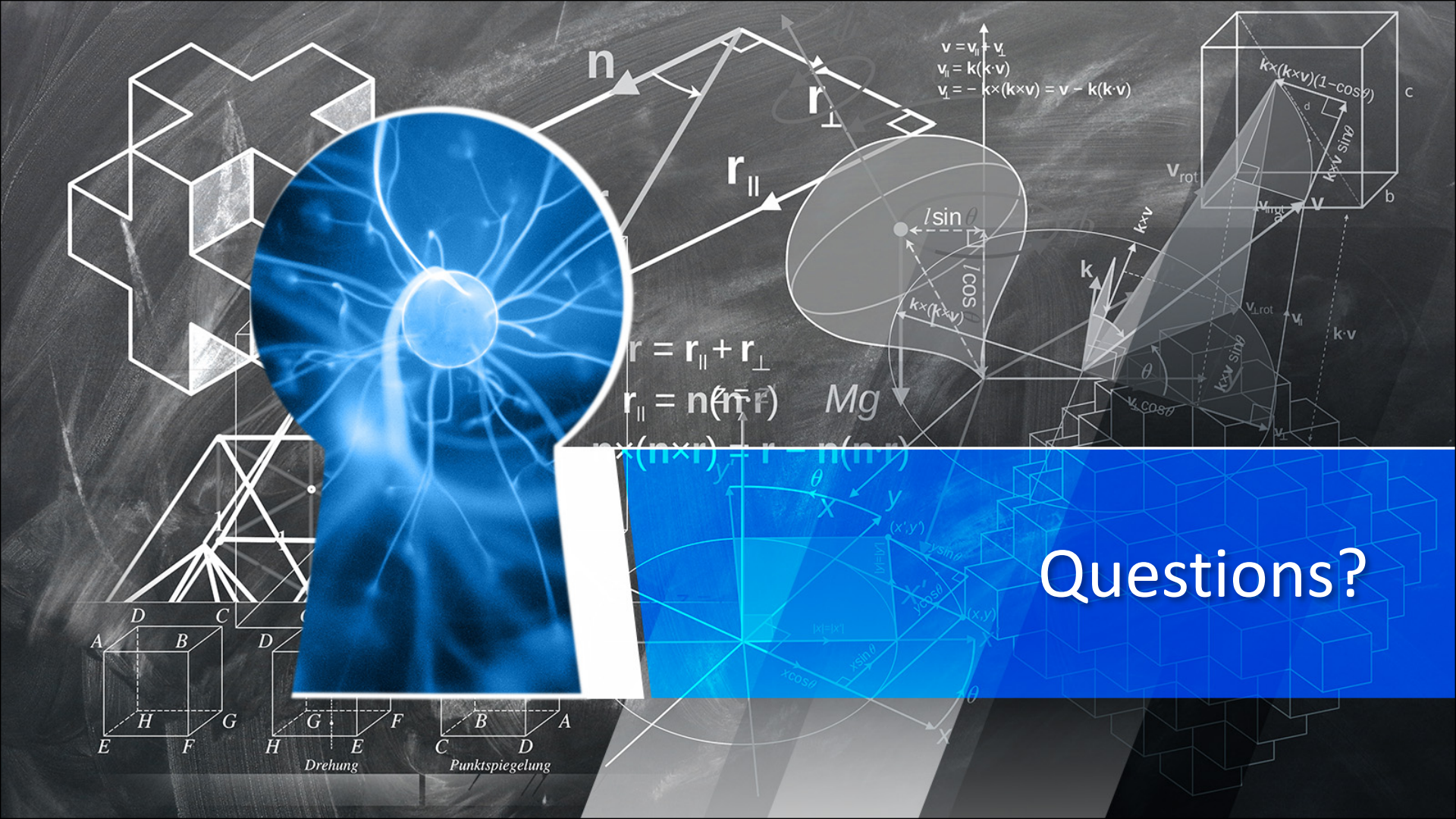
  - For the two light modes: one MUST be vertically polarized and the other MUST be horizontally polarized





What's Next?

- We are trying to recreate Classical entanglement with regular Light beams and then LG beams
- We want to evaluate the quality, how they propagate, and see the effects the beams can create
- Make observations


Questions?