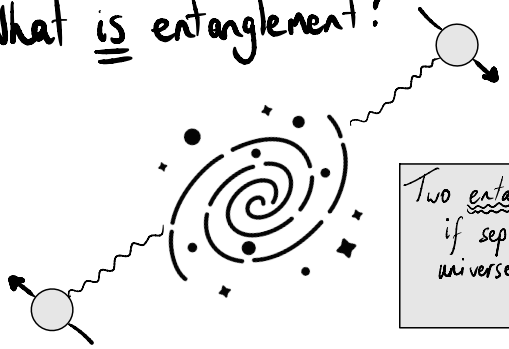
How does entanglement evolve in quantum gases?

UNIVERSITÄT HEIDELBERG ZUKUNFT SEIT 1386

What is entanglement?

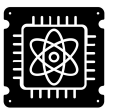


Two entangled particles — even if separated by the entire universe — can "communicate" without time delay

Why study entanglement?

Quantum Teleportation

Quantum Encryption



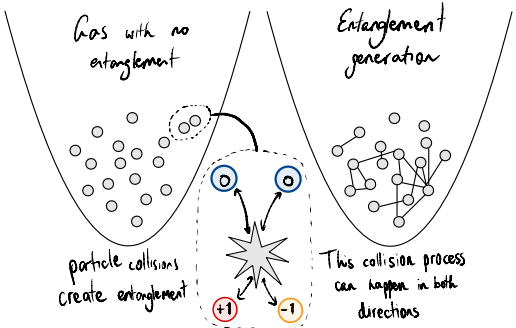
Quantum Computing

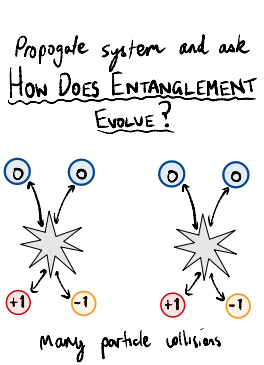
Quantum Metrology

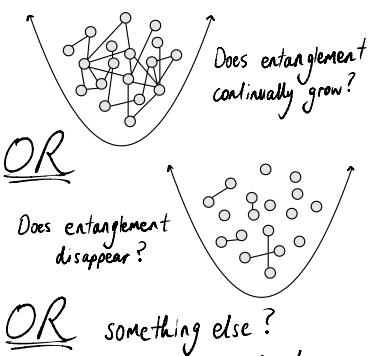
Our Research with Ultracold Quantum Gases

"Ultracold" here means 0.00000001 K (~ −273.15 °C)!

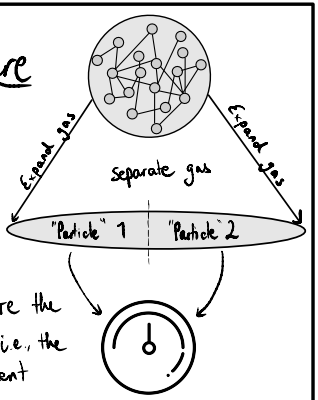
Ultracold quantum gases are ideal systems to study complex quantum phenomena







How to measure entanglement



Here, we measure the "communication", i.e., the entanglement

The measurement itself is incredibly hard! The central goal of this project is to improve upon current techniques.