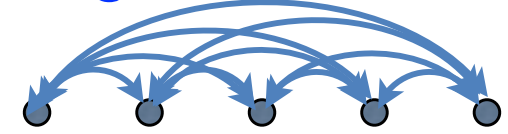


Fast Entanglement Generation and Quantum Information Transfer in Quantum Systems with Long-Range Interactions

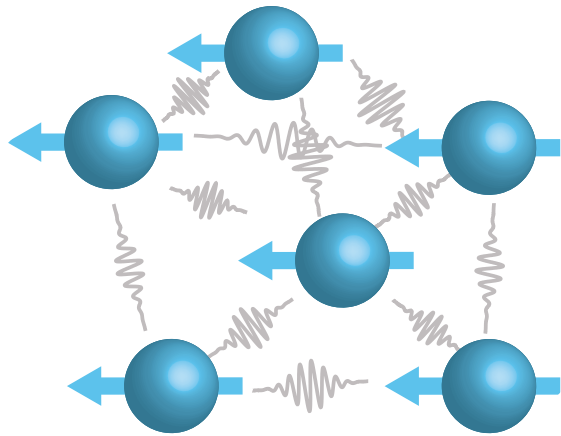
• short-range



vs long-range

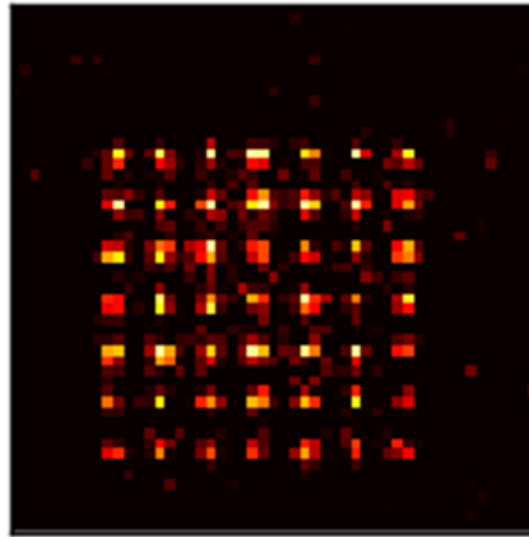


Defects in solids



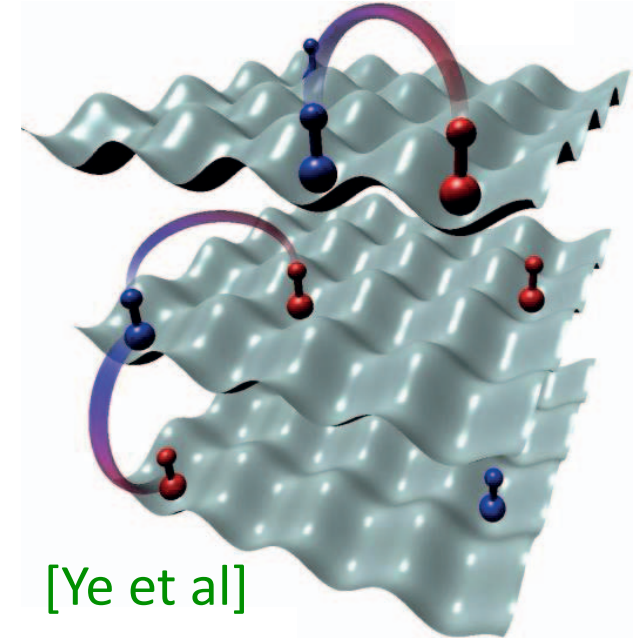
[Lukin et al]

Rydberg atoms



[Browaeys et al]

Polar molecules



[Ye et al]

• fast preparation of entangled states for **time-keeping and sensing** (electrometry, magnetometry, thermometry, gravimetry)

• medium for fast quantum state transfer: speed up many **quantum computing** algorithms and outpace decoherence