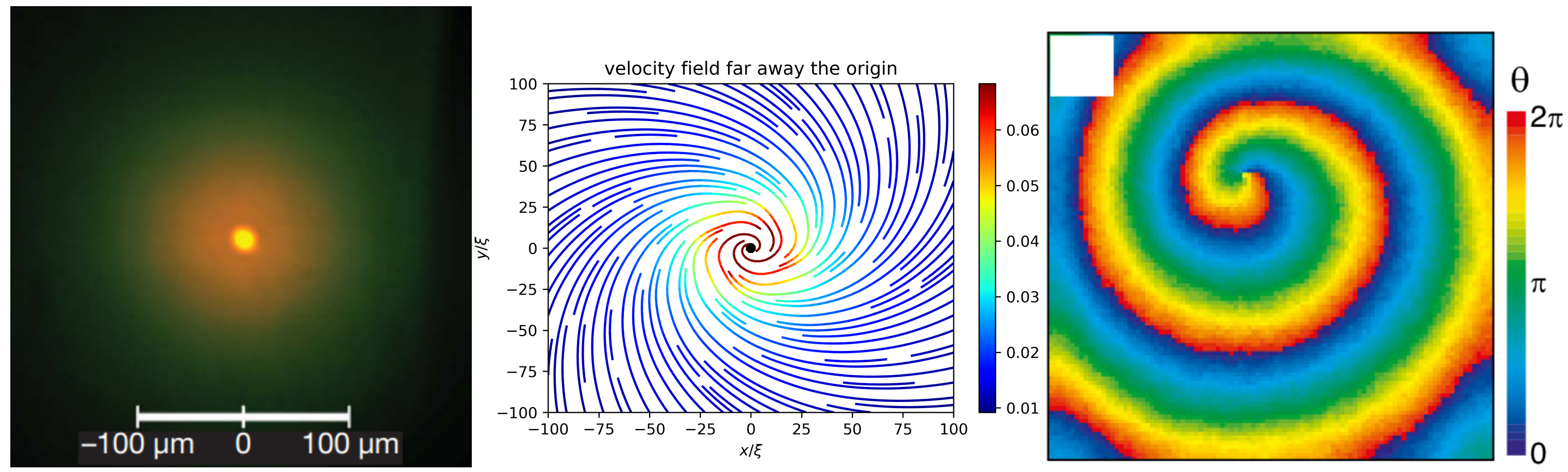
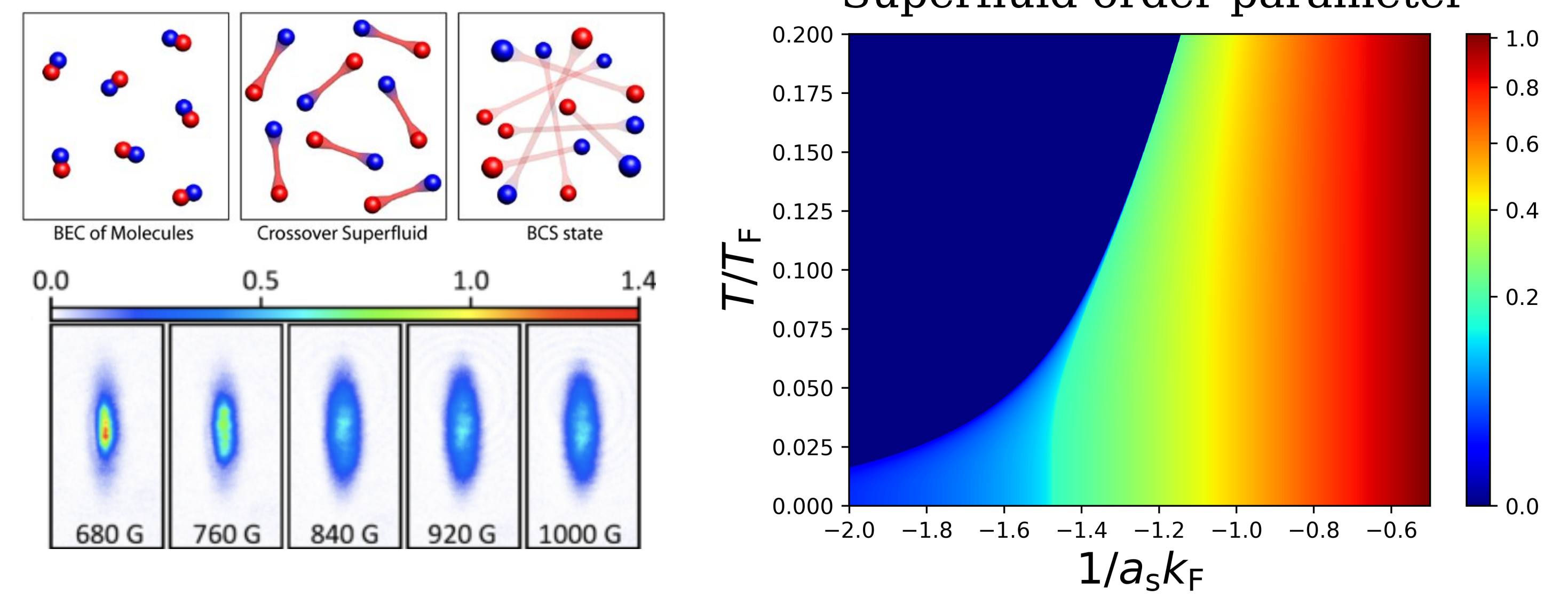


Photon Bose Einstein condensate



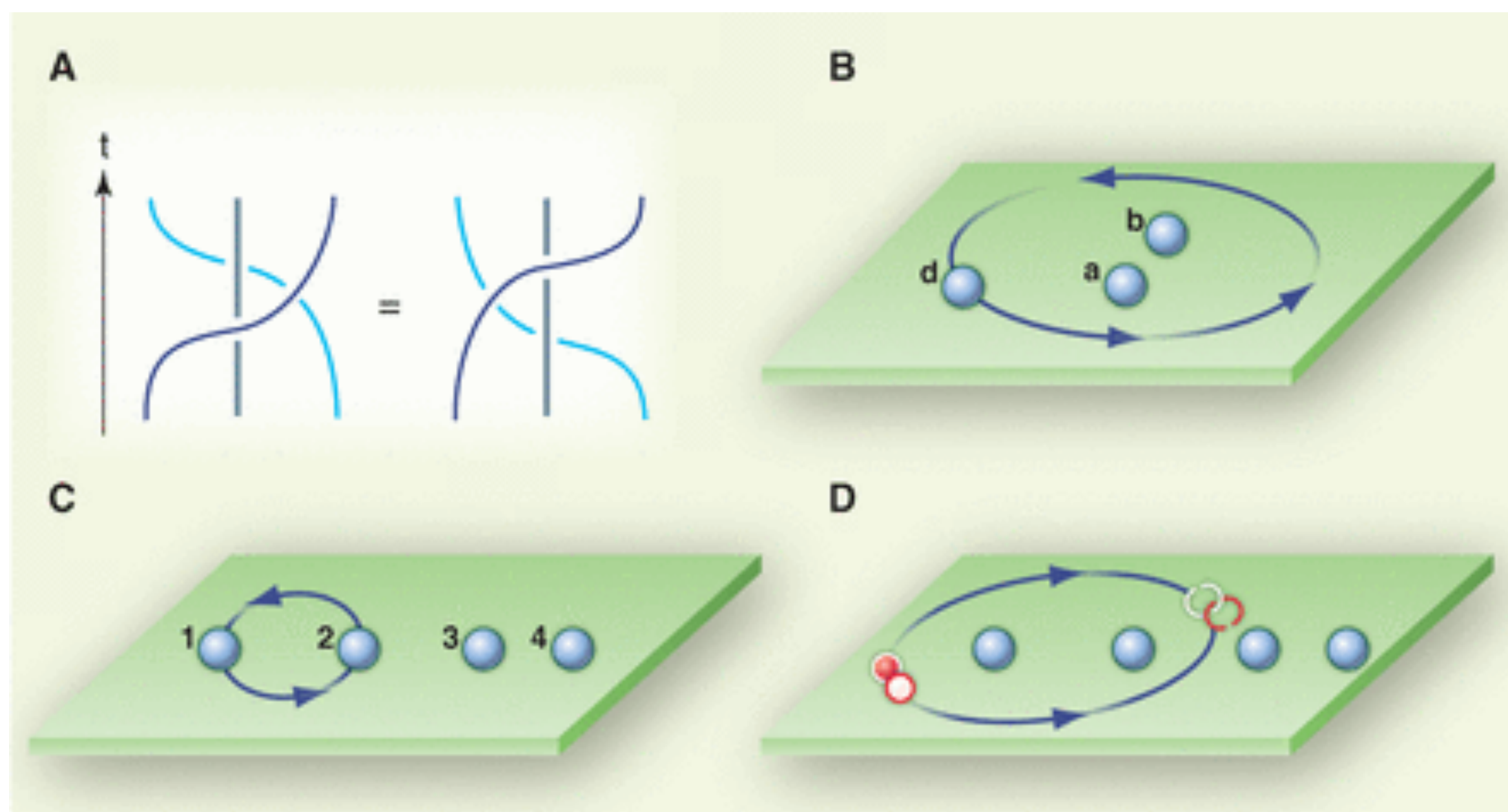
- ⇒ Theory support for new photon BEC setup in AG von Freymann
- ⇒ Superfluidity due to vortex unbinding in 2D photon gases
- ⇒ Universality classes of condensate phase (BKT, KPZ, Kibble-Zurek,..)

Fermionic superfluidity: BEC-BCS crossover



- ⇒ Theory support for ^6Li experiment in AG Widera
- ⇒ Direct thermometry method from density measurement
- ⇒ Impact of spatial and temporal disorder

Anyonic quantum gases



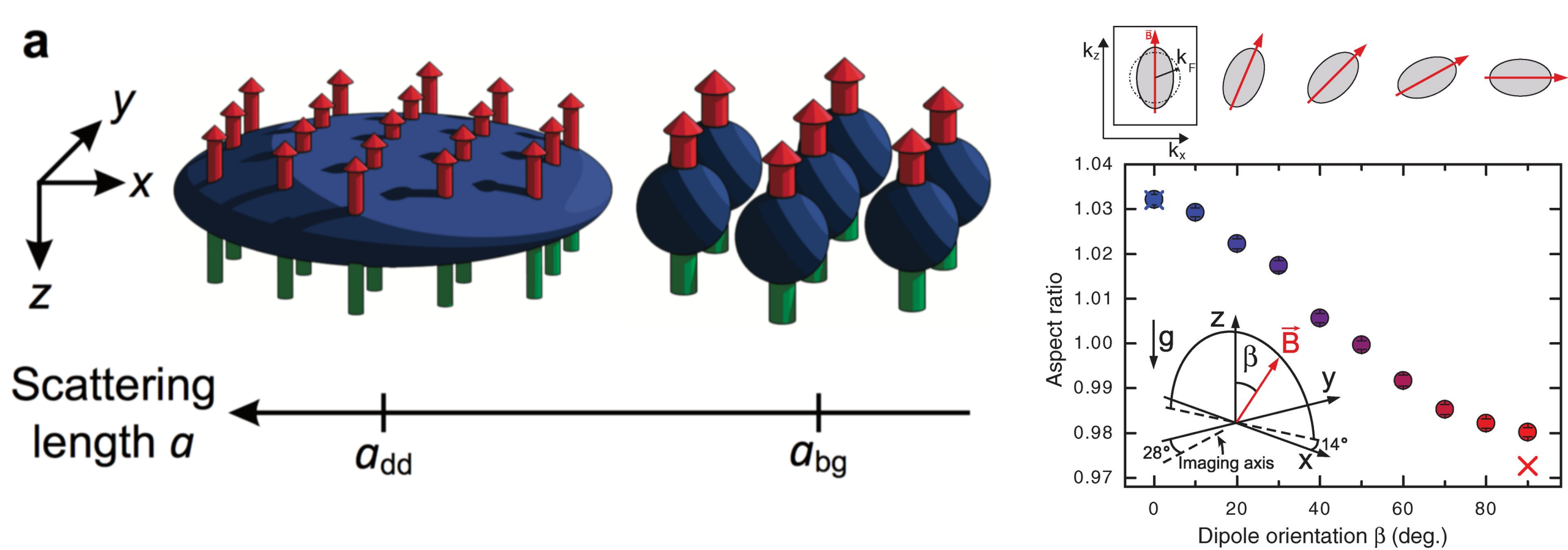
- ⇒ Interpolation between Bose-Einstein and Fermi-Dirac statistics
- ⇒ Coupling to anyonic baths and impact on transport

Quantum gases on curved manifolds



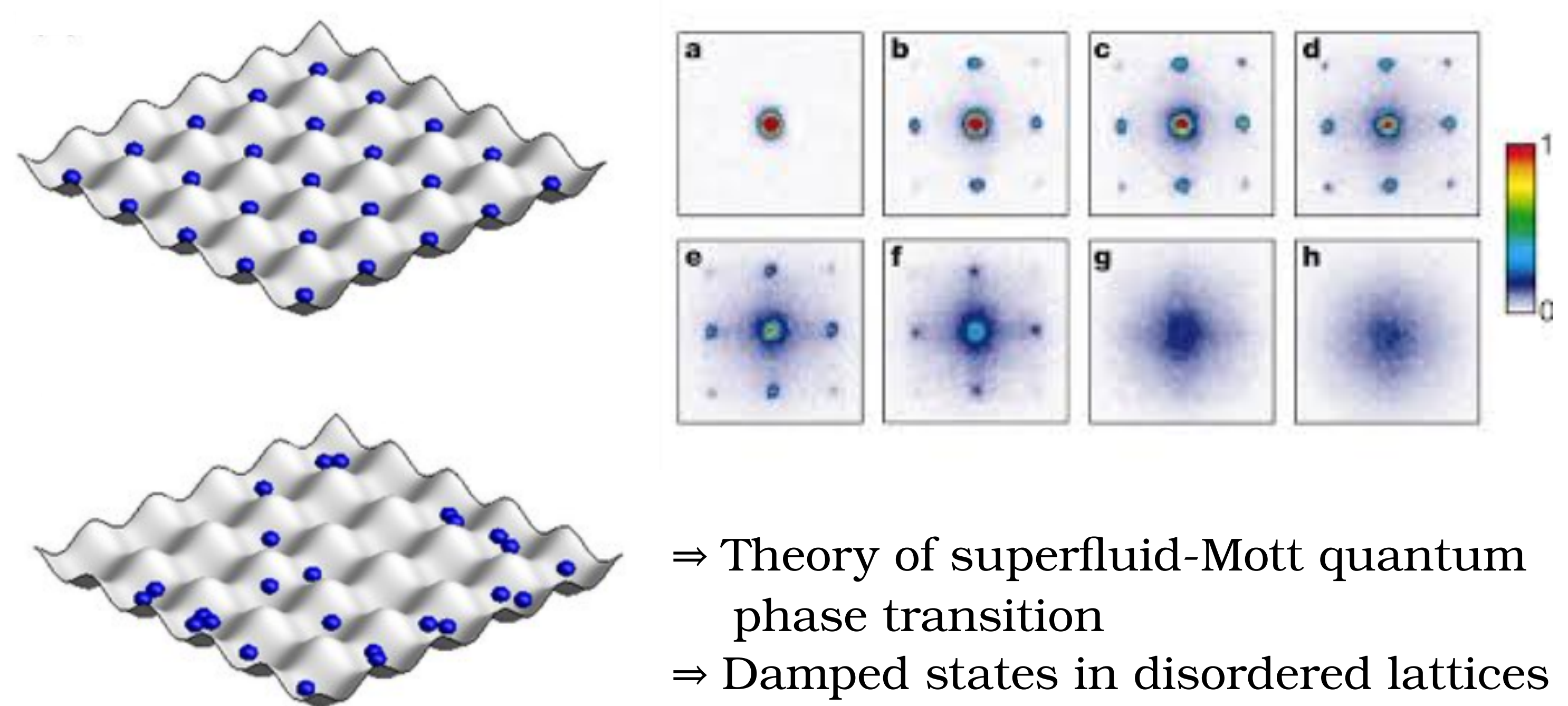
- ⇒ Emergence of superfluidity by vortex/antivortex binding
- ⇒ Thermodynamics of interacting fermionic gases
- ⇒ How does geometry affect superfluidity?

Strong dipolar gases

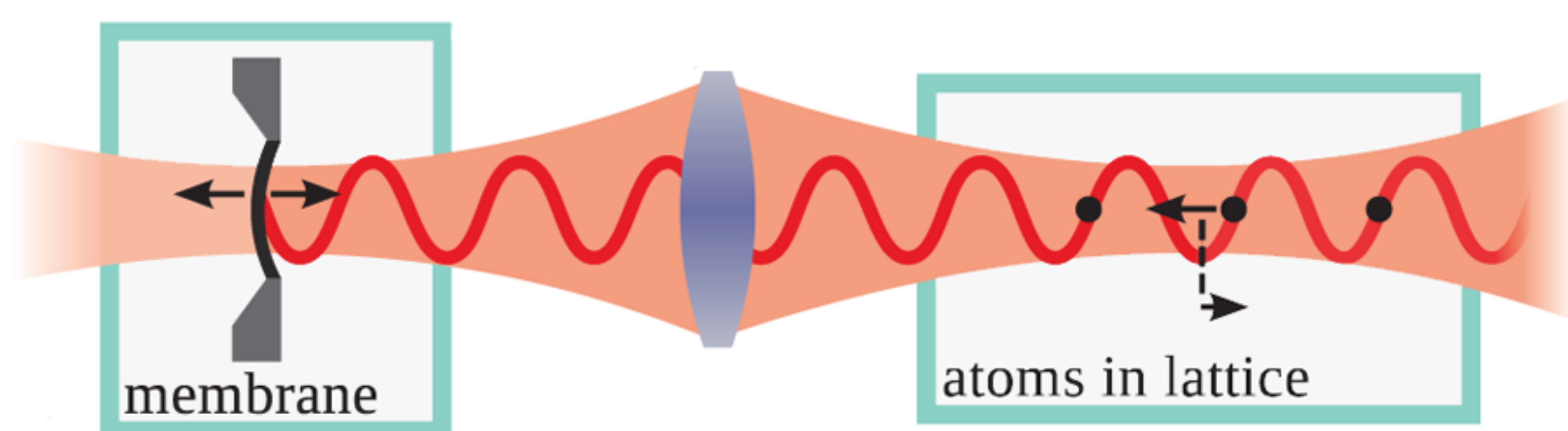


- ⇒ Formation and properties of quantum droplets
- ⇒ Emergence of supersolidity in dipolar bosonic systems
- ⇒ Ellipsoidal deformation of Fermi sphere
- ⇒ Impact on fermionic superfluidity? BEC-BCS crossover?

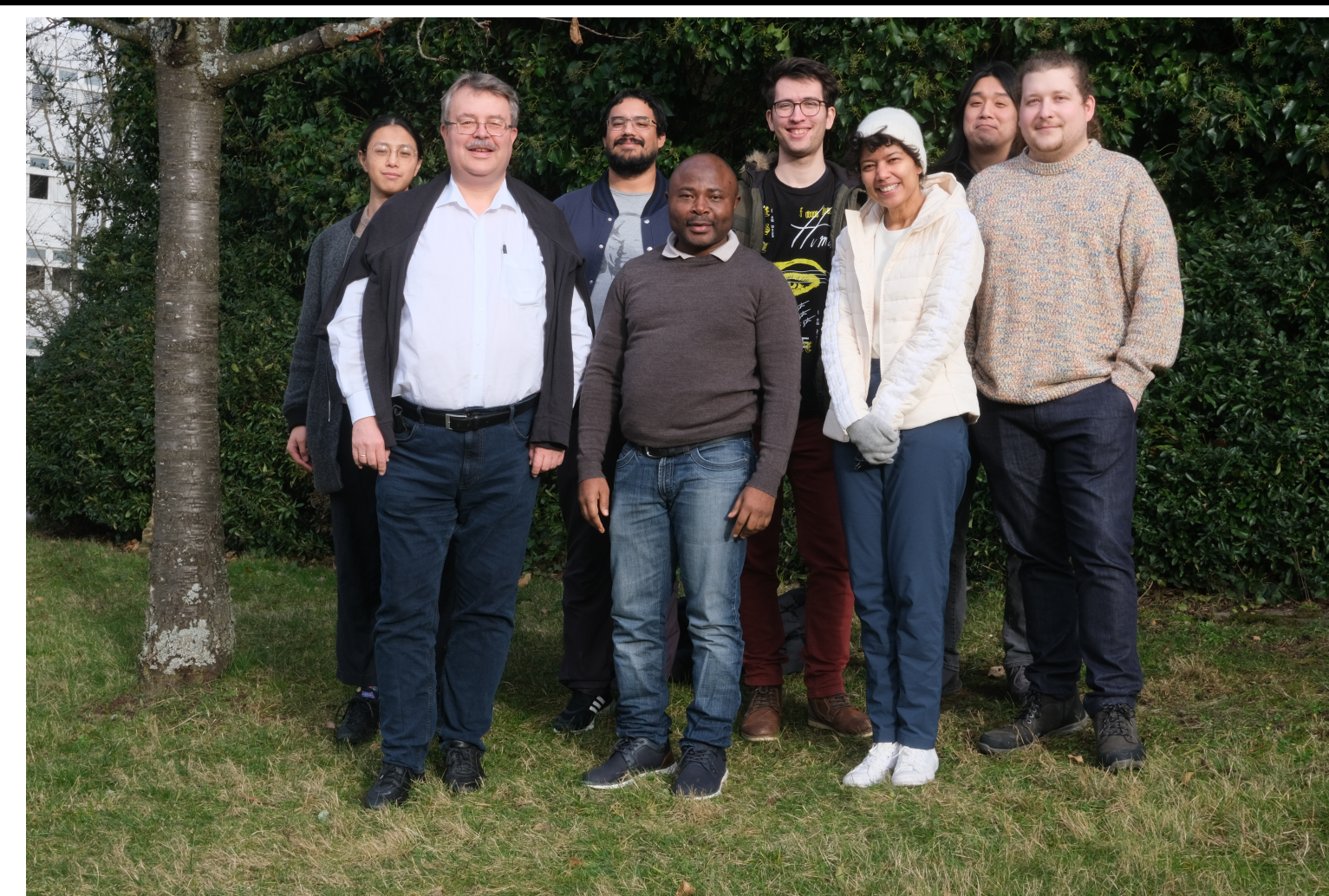
Bosons in an optical lattice



Hybrid atom-optomechanical systems



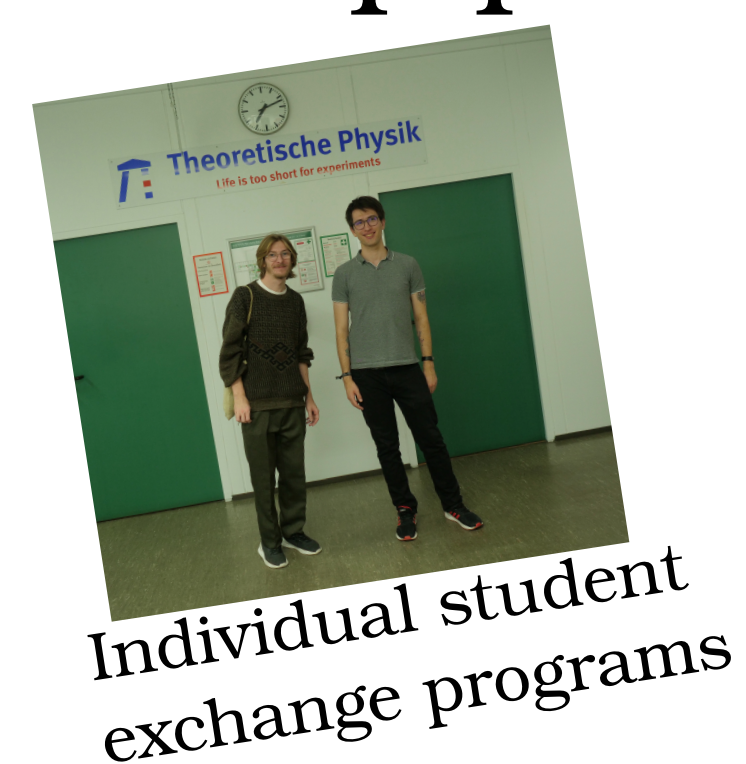
- ⇒ Theory of cooling of a nanomembrane
- ⇒ How does cavity mediate long-range interactions?
- ⇒ Cavity-induced quantum droplets?
- ⇒ Engineer non-equilibrium quantum phase transition



Group picture



The students



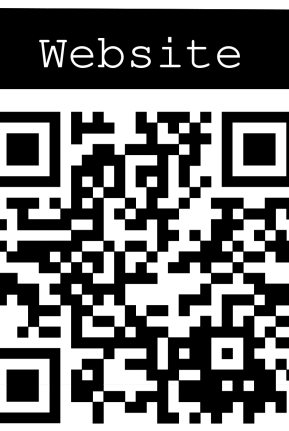
Individual student exchange programs



Regular organized schools and conferences



Les Houches summer school



Website