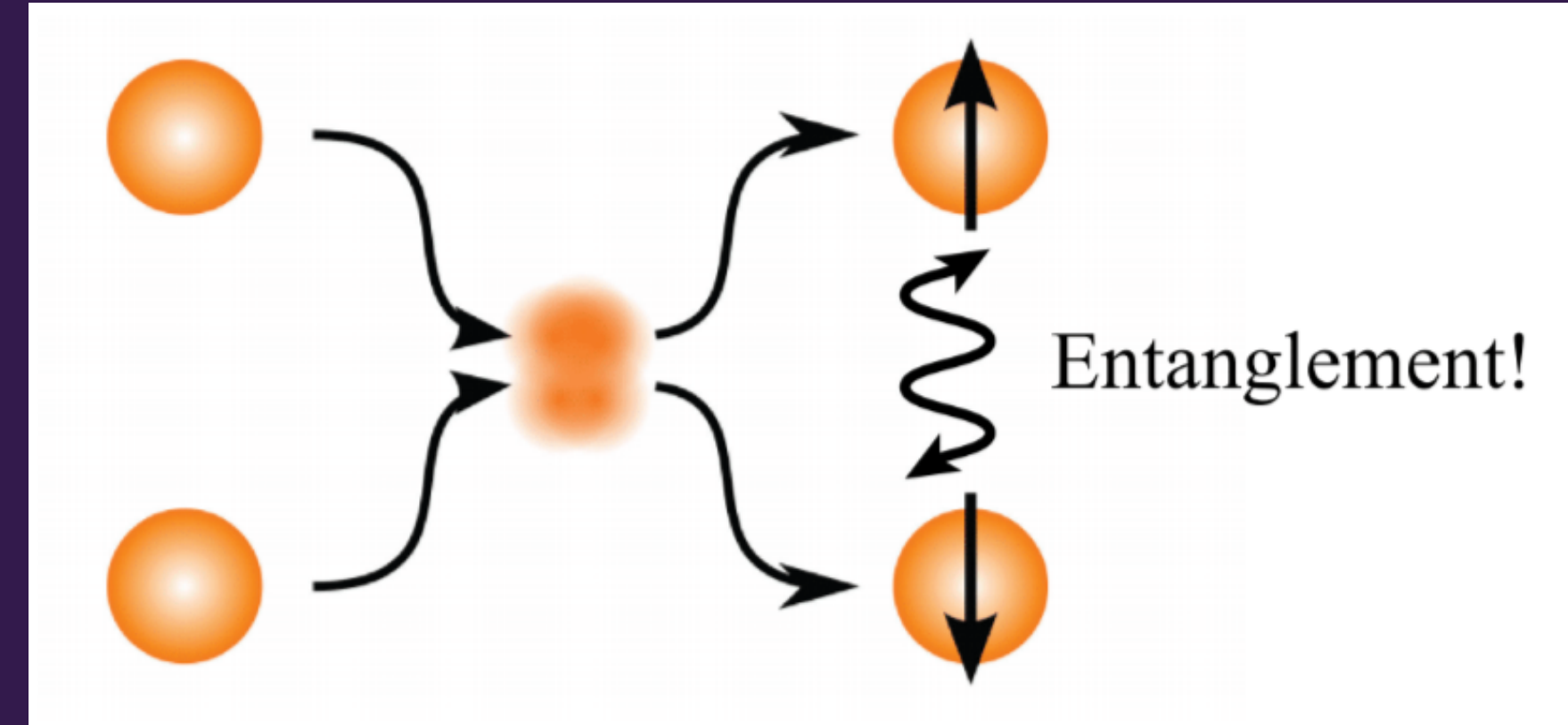
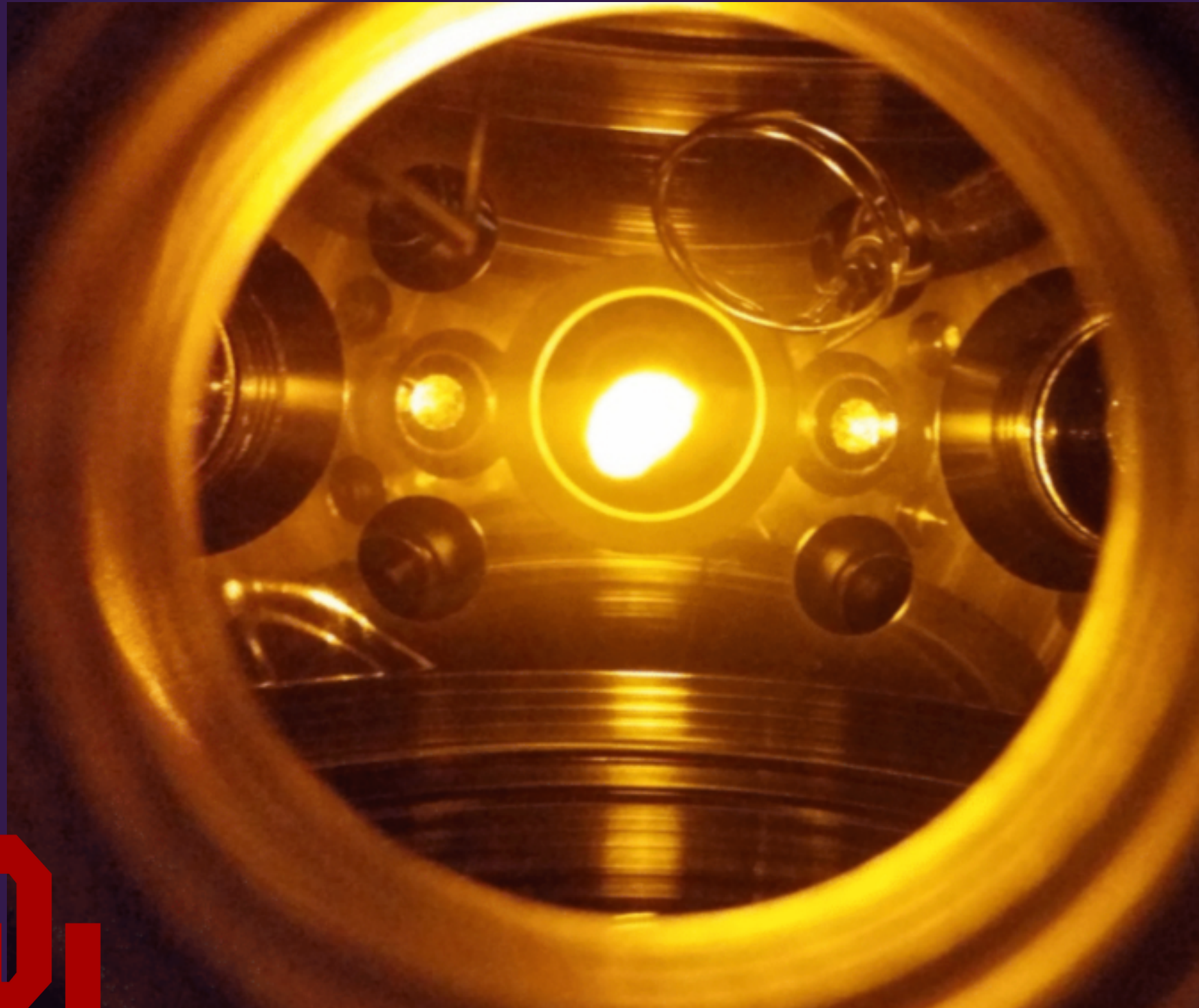


Laser Cooling and Trapping of Sodium



Deedee Jansen
Schwettmann Group





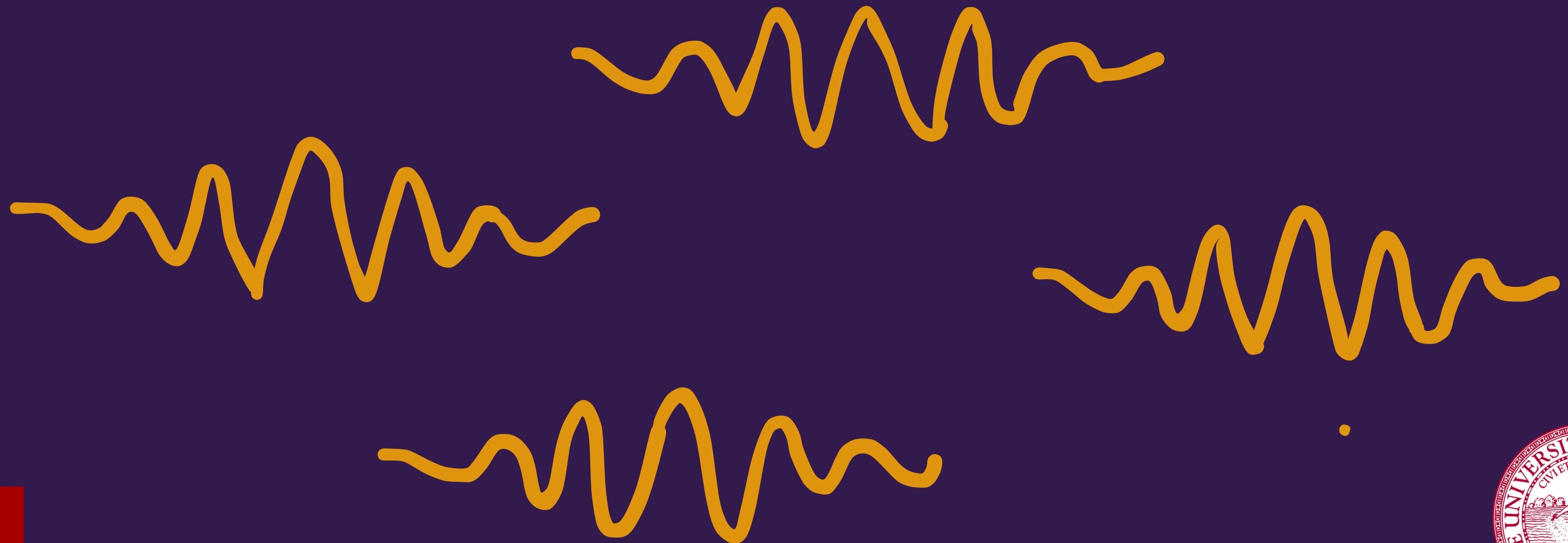
- **Collisions are Controllable**
- **Reduced errors in measurements**



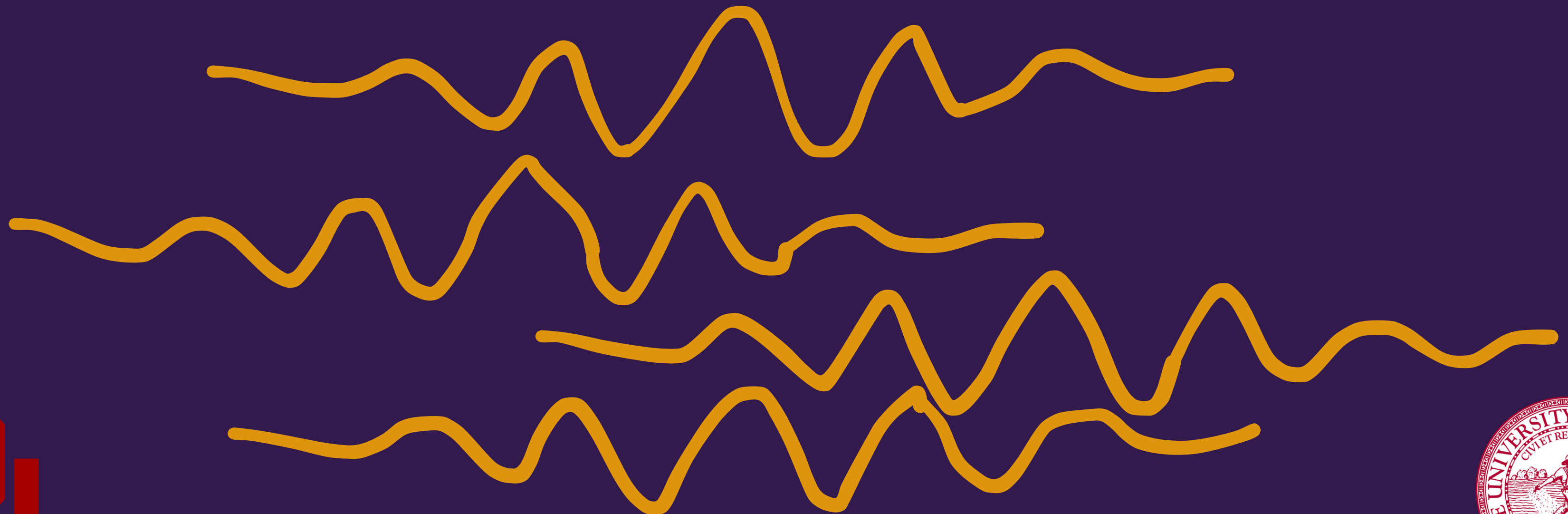
Giant Coherent Matter Wave



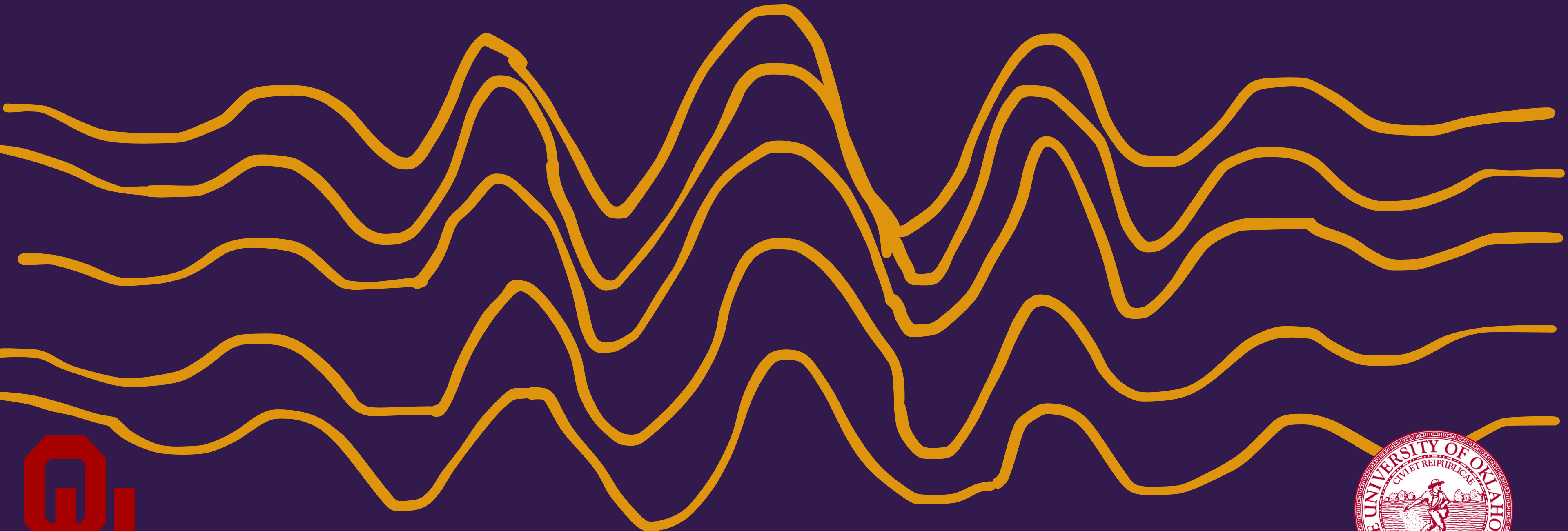
Giant Coherent Matter Wave



Giant Coherent Matter Wave



Giant Coherent Matter Wave





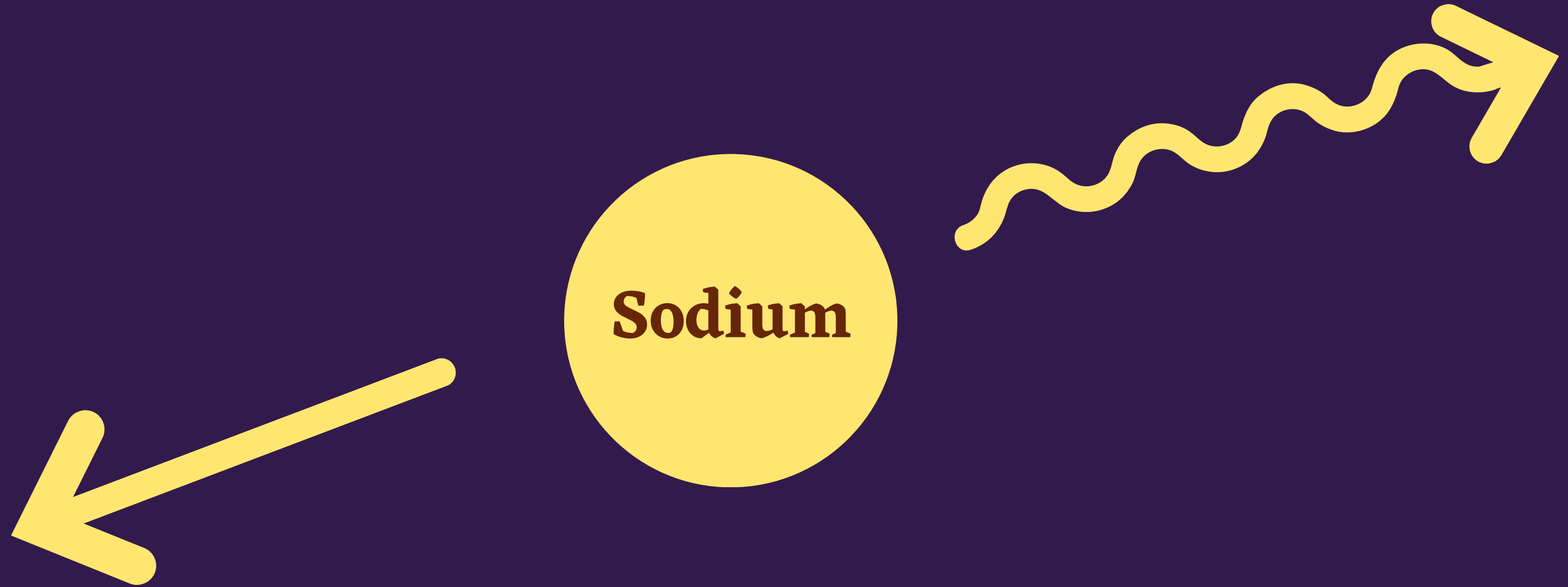
Absorption





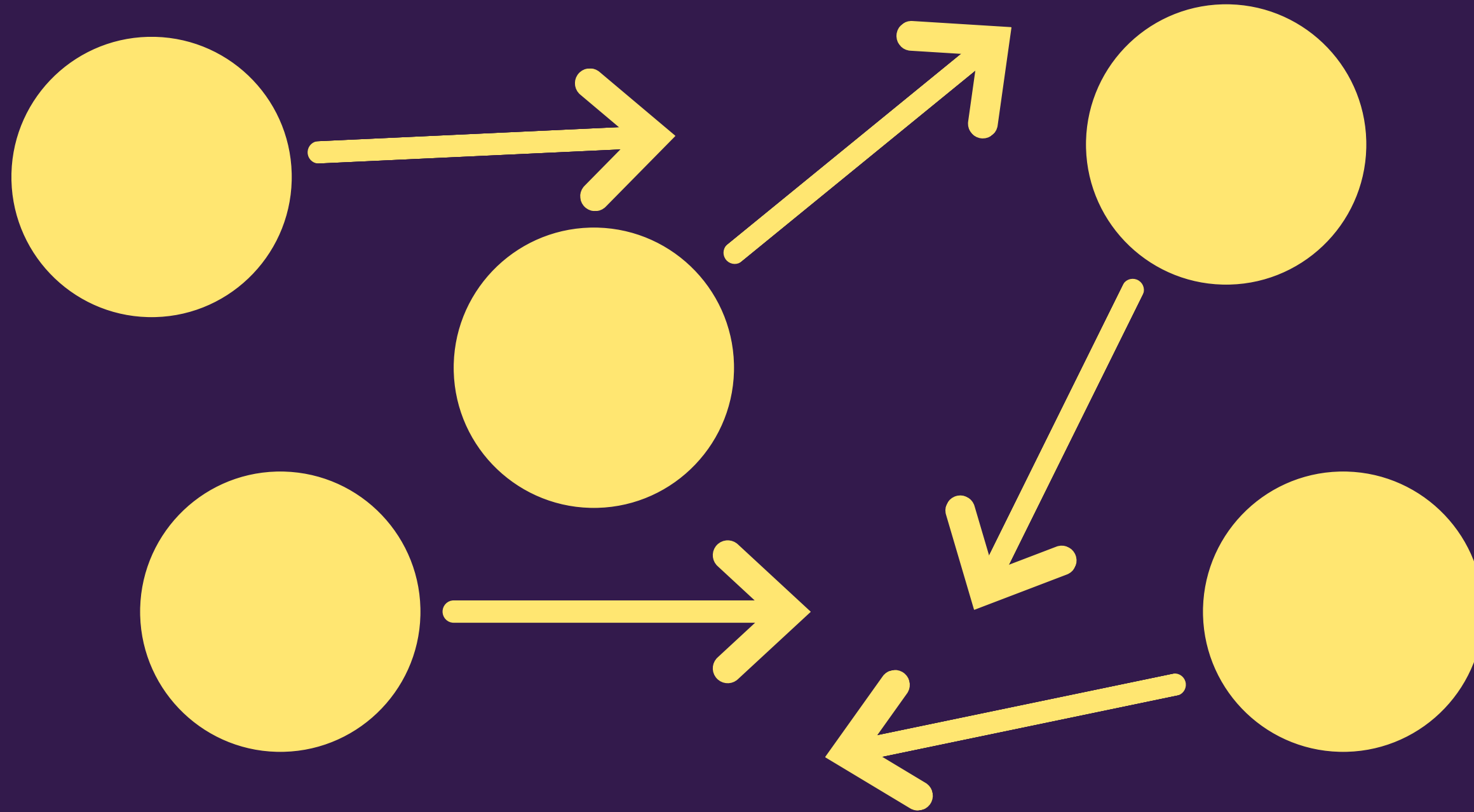
Excited State





Spontaneous Emission
Kick in Random Direction





Atoms move in all
directions



Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks

1st excited State

Energy Gap that Determines Color

Sodium - Orange (589 nm)



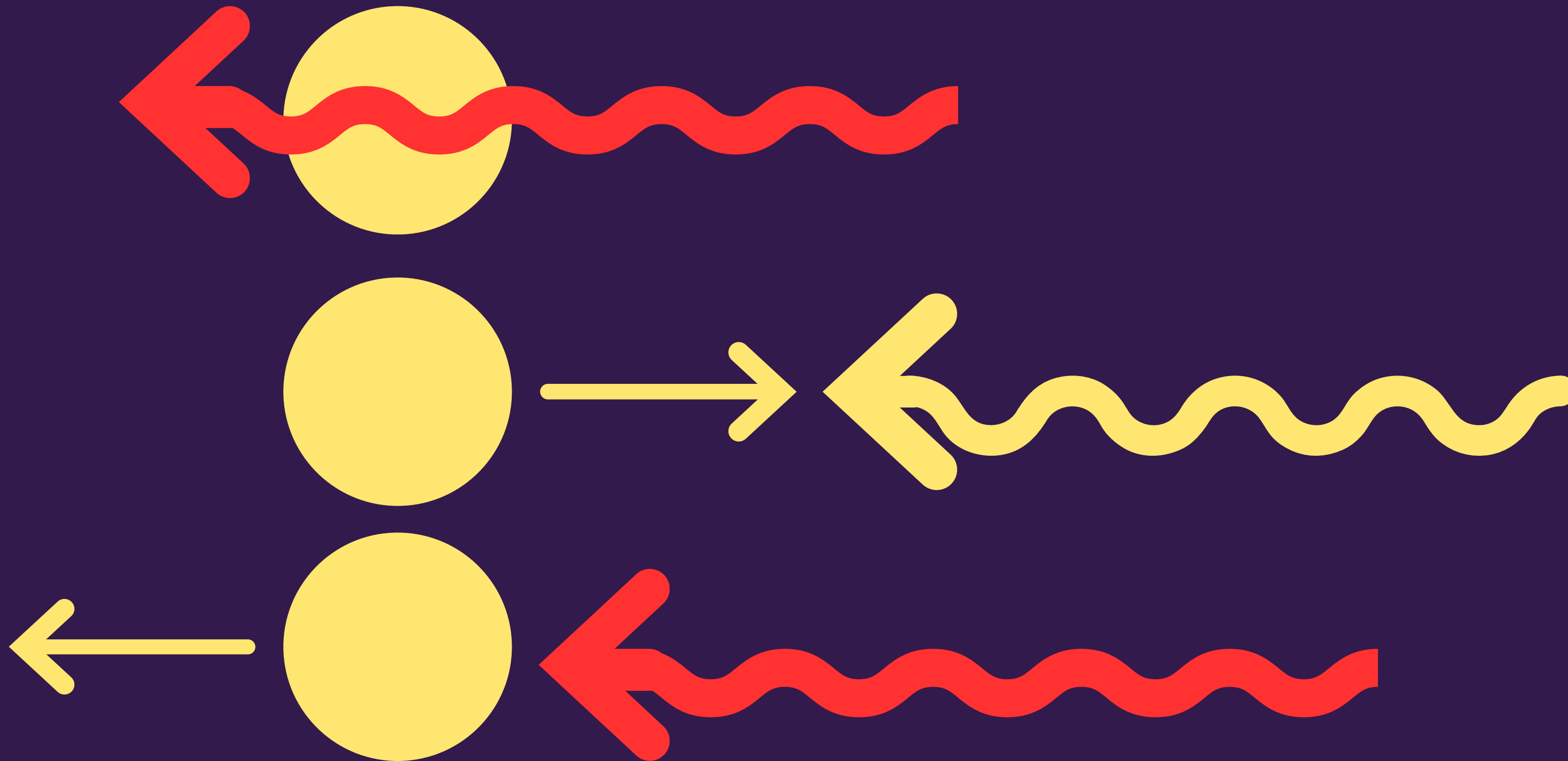
Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks



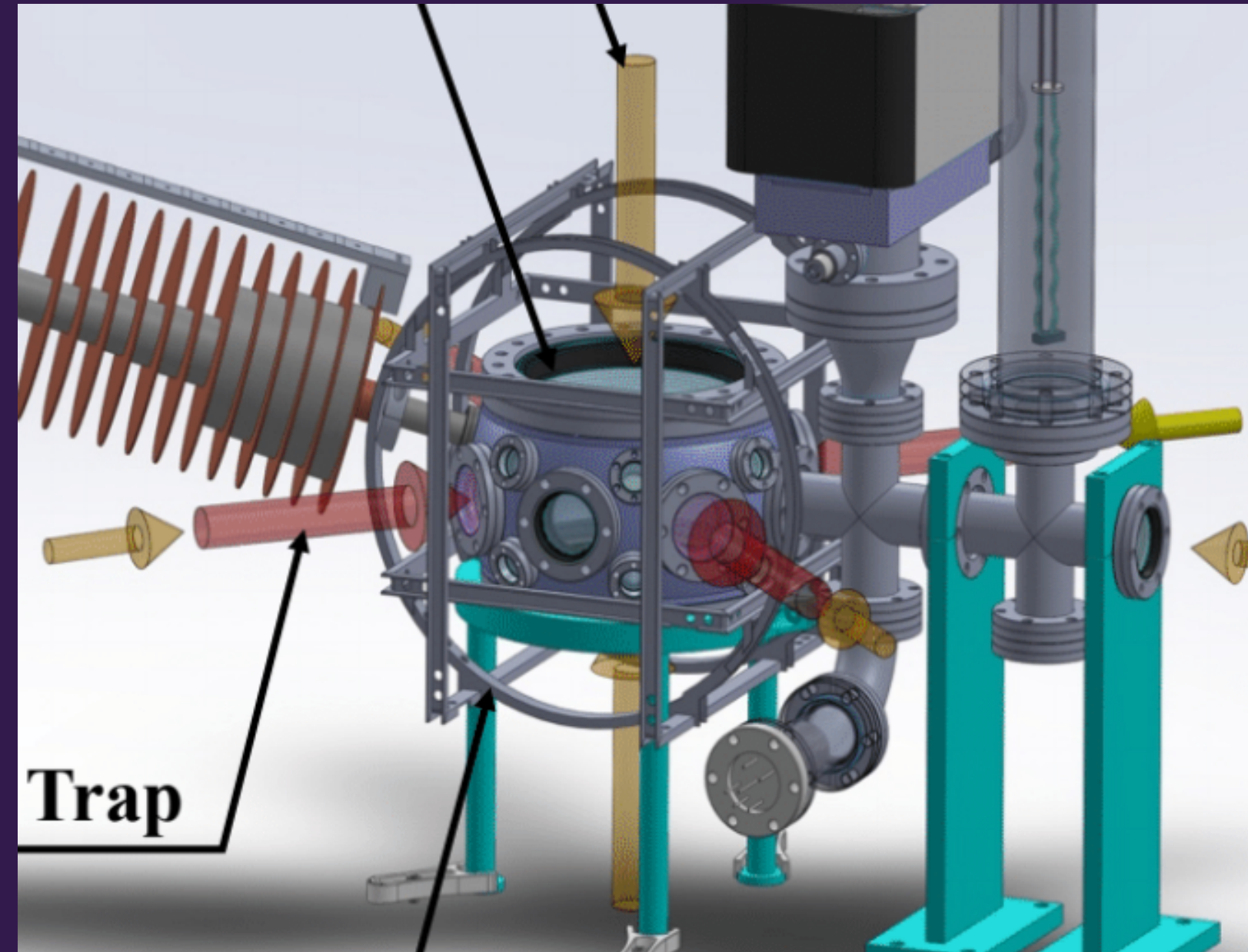
Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

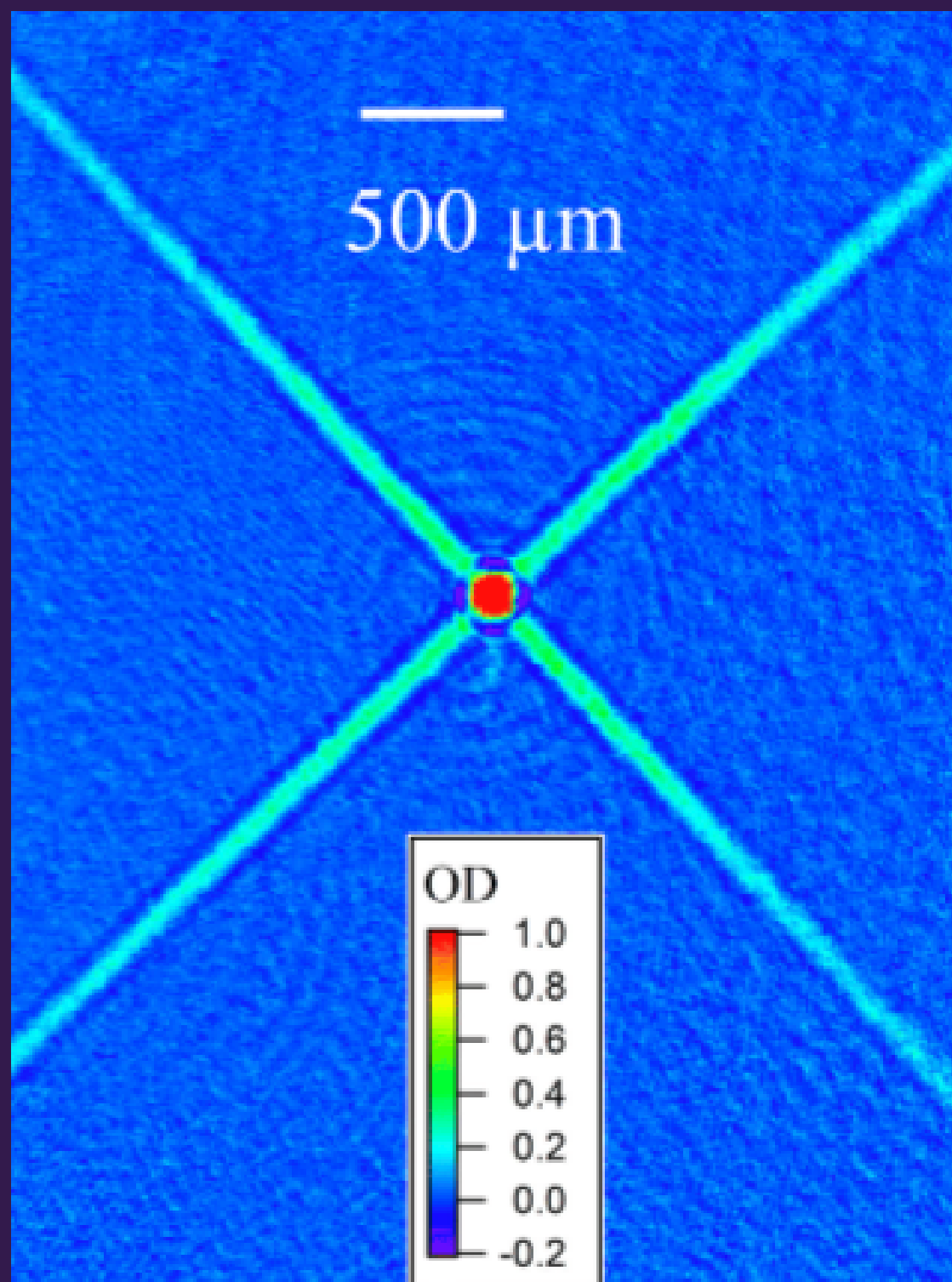
Forced
Evaporation

My Tasks

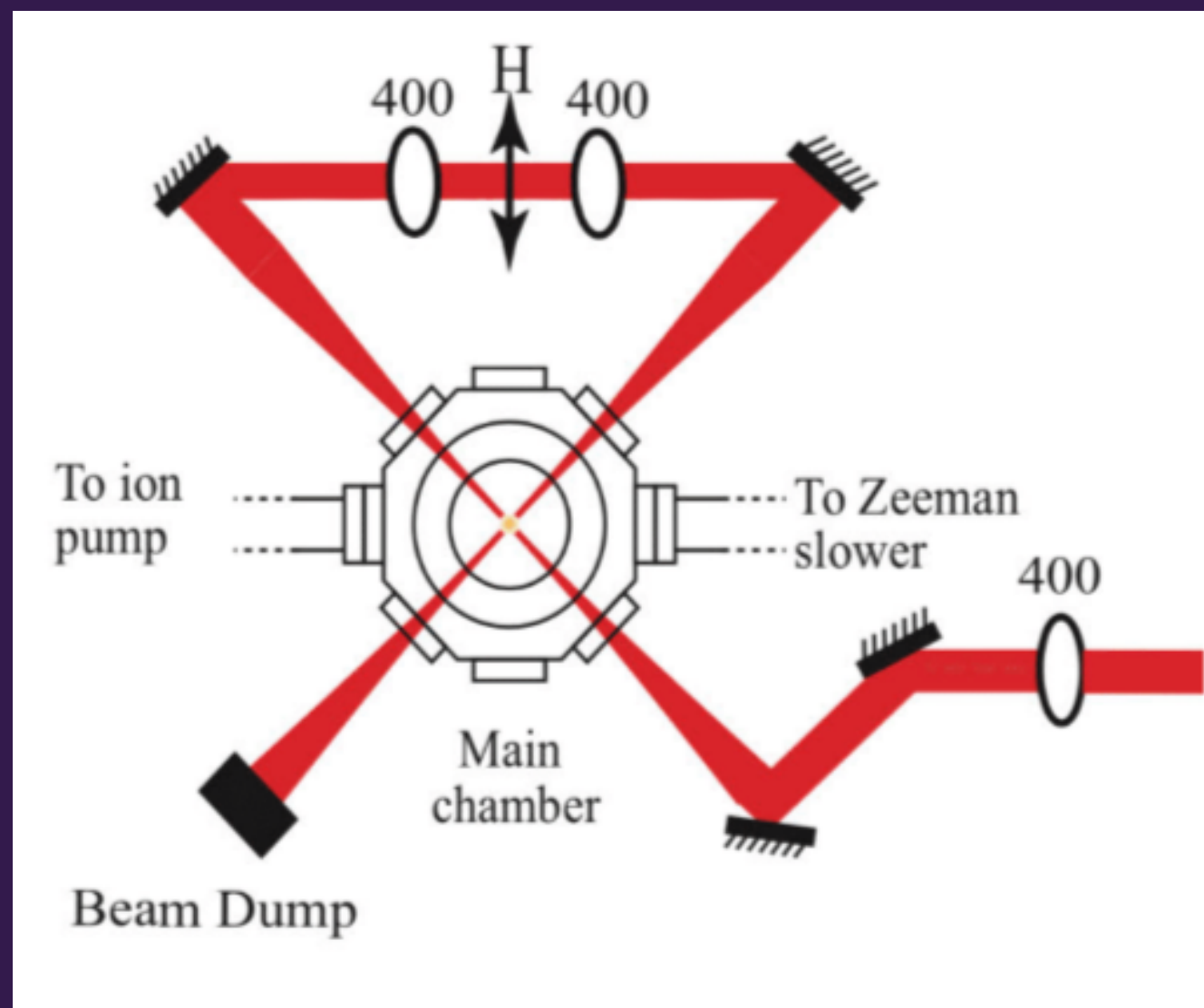


**Magneto-Optical Trap (MOT):
Doppler Cooling and Magnetic Field**





Far-off resonance crossed optical dipole trap (FORT)



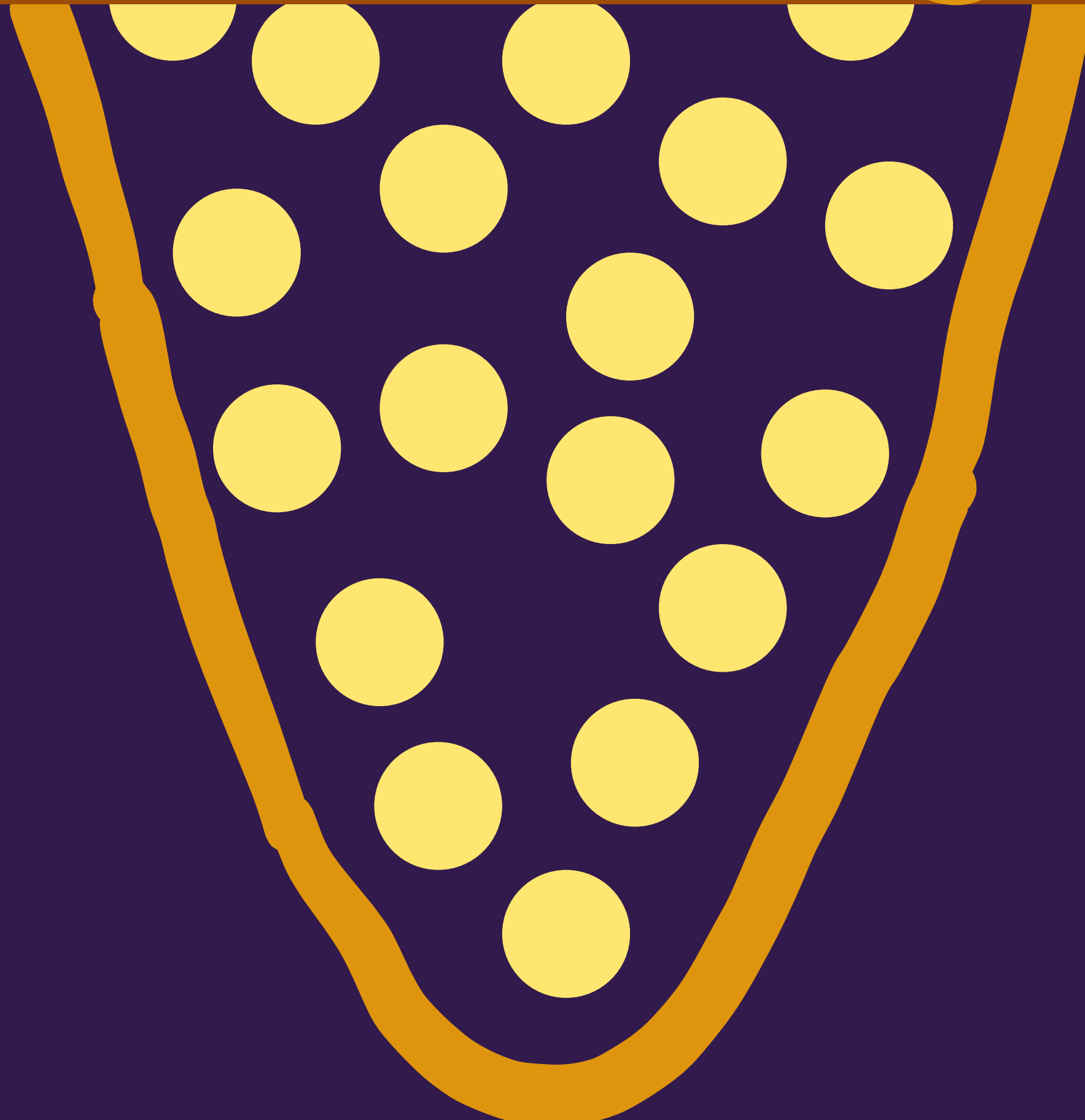
Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks



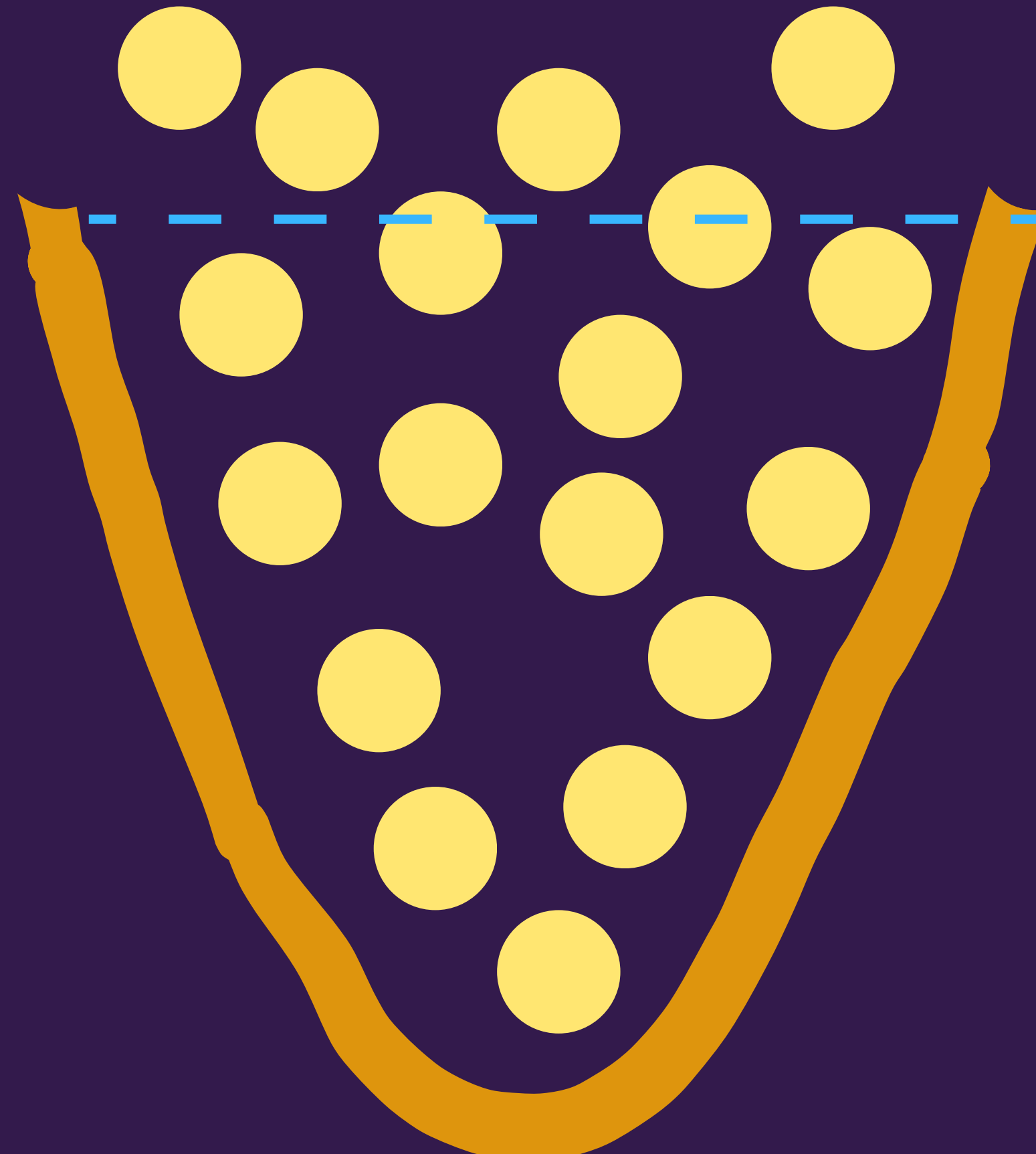
Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks



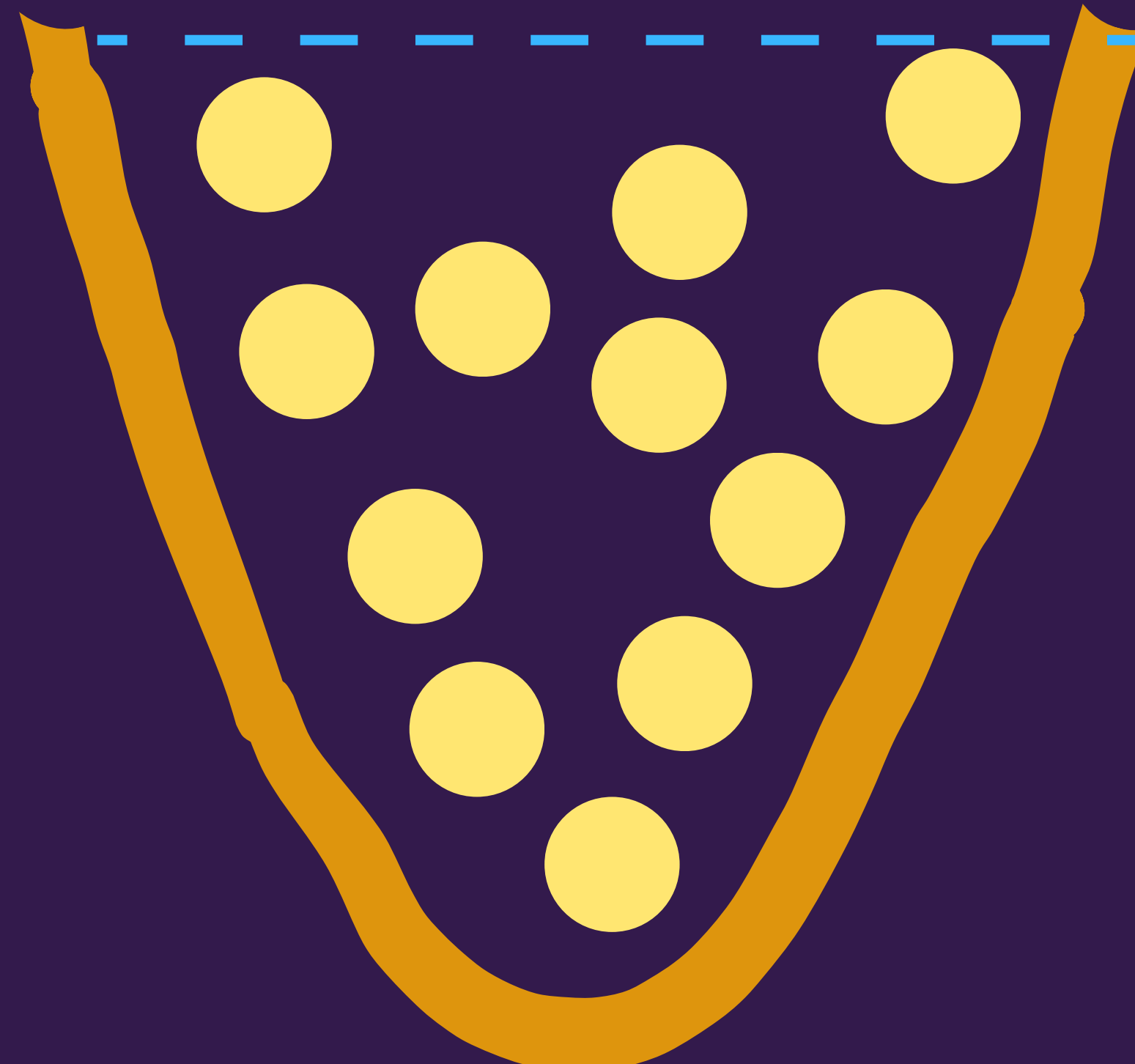
Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks



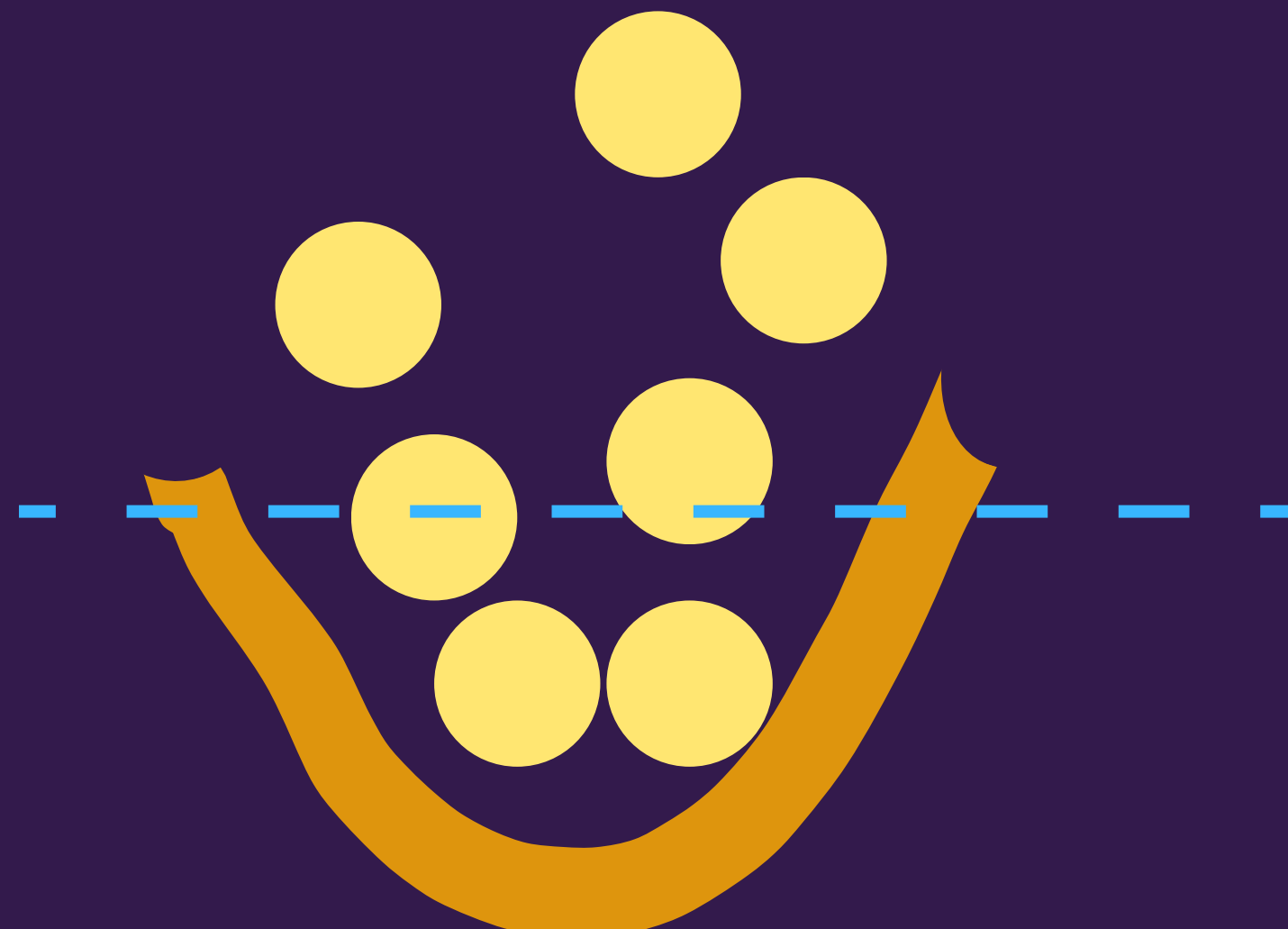
Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks



Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks



Bose-Einstein
Condensate

Exerting a Force
on an Atom

Doppler Cooling

Forced
Evaporation

My Tasks

Water Cooling of Anti-Helmholtz Coils



Bose-Einstein
Condensate

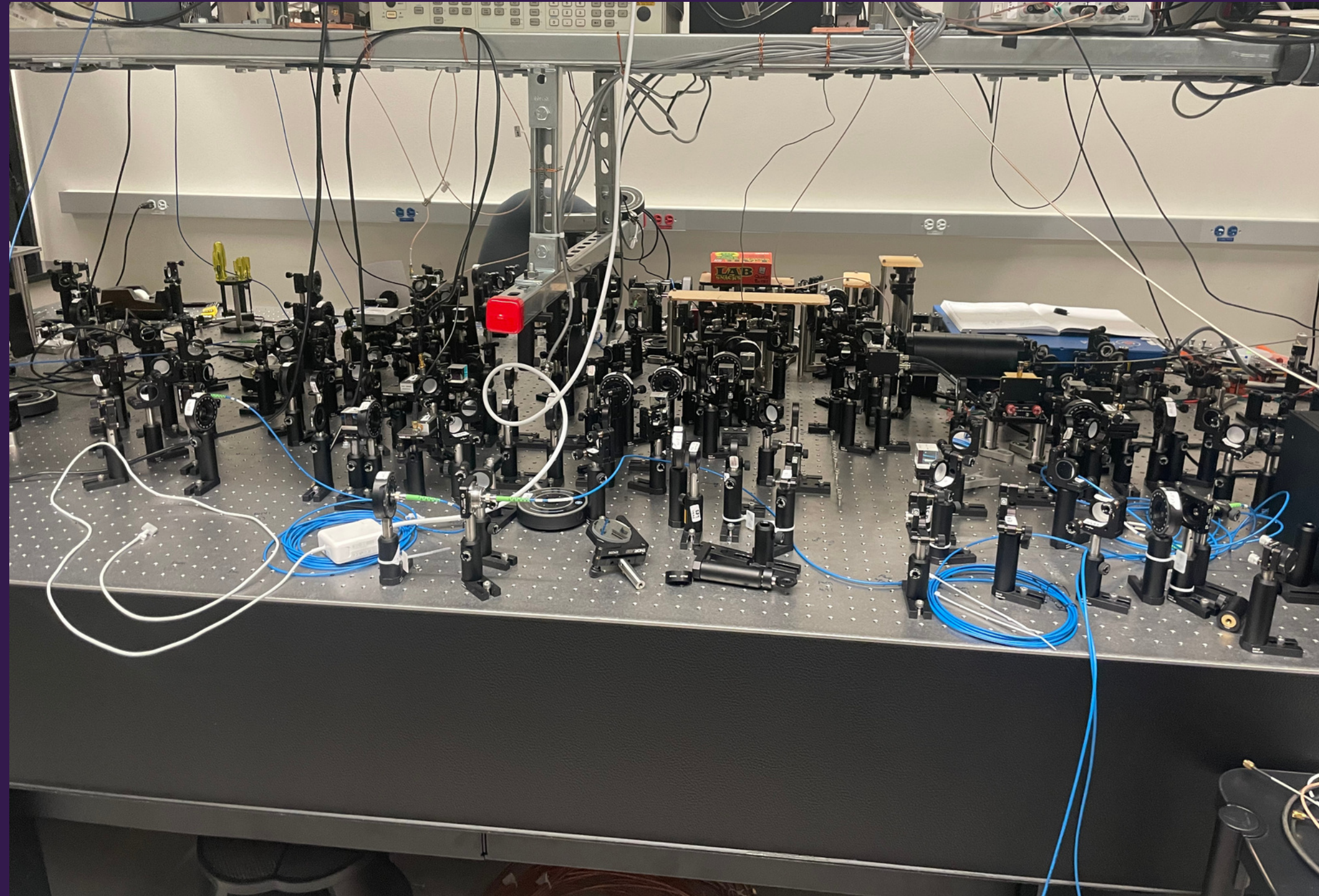
Exerting a Force
on an Atom

Doppler Cooling

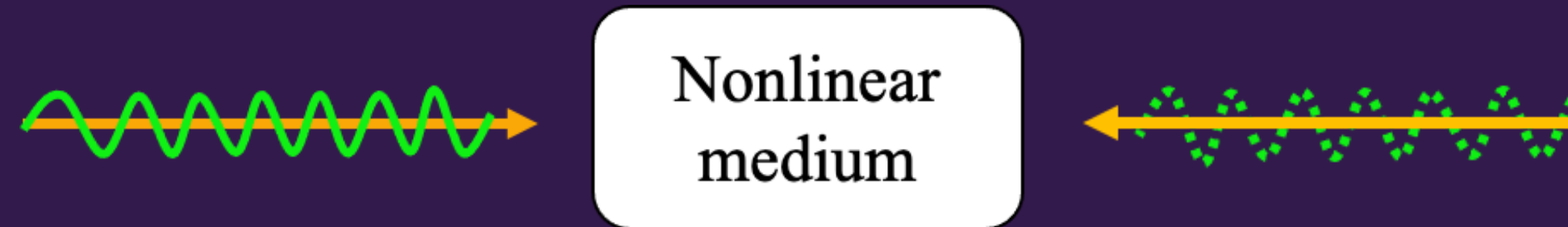
Forced
Evaporation

My Tasks

Optical Alignment



Laser Locking



Modulation Transfer
Spectroscopy

