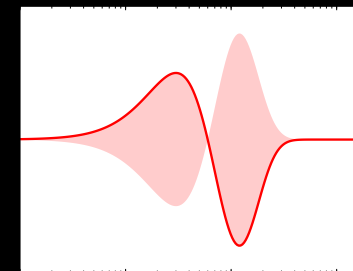
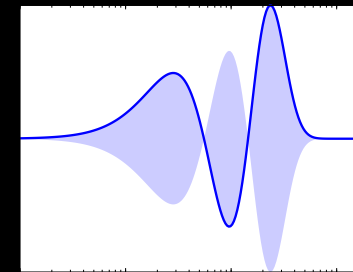
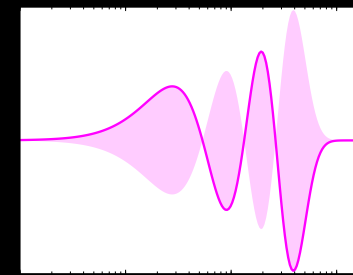
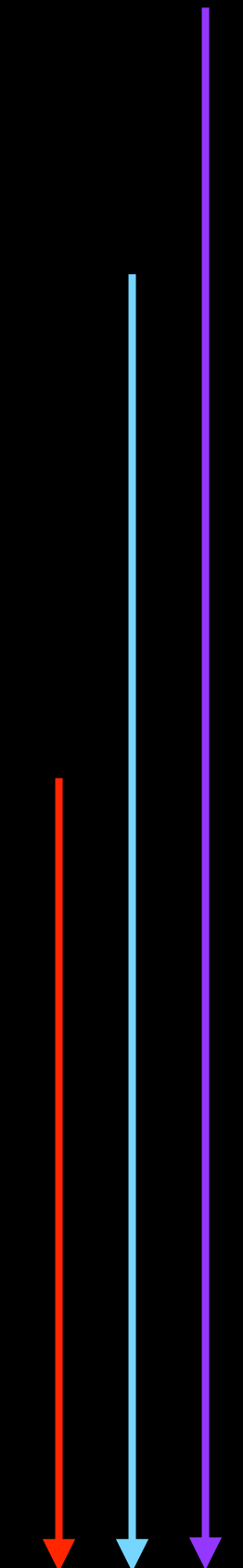
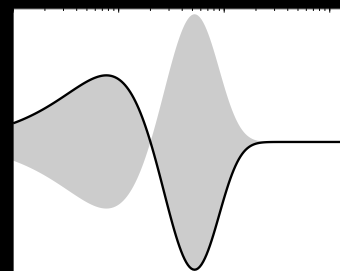
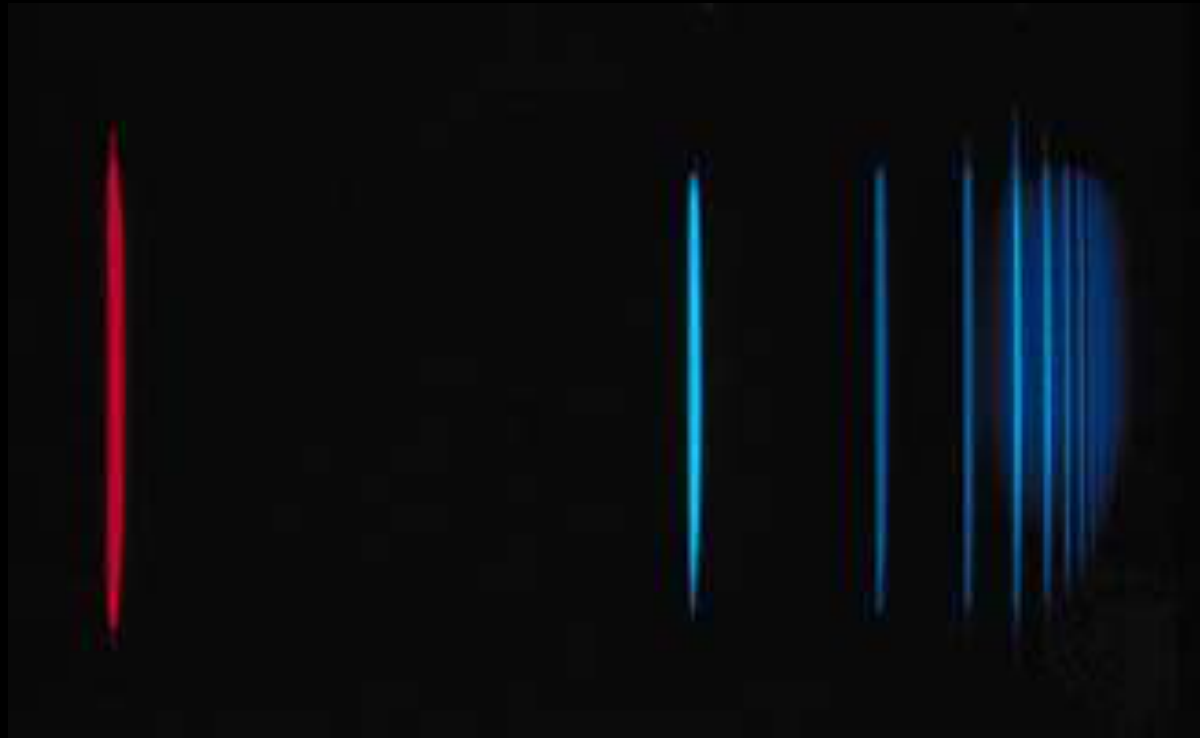


Quantum dots

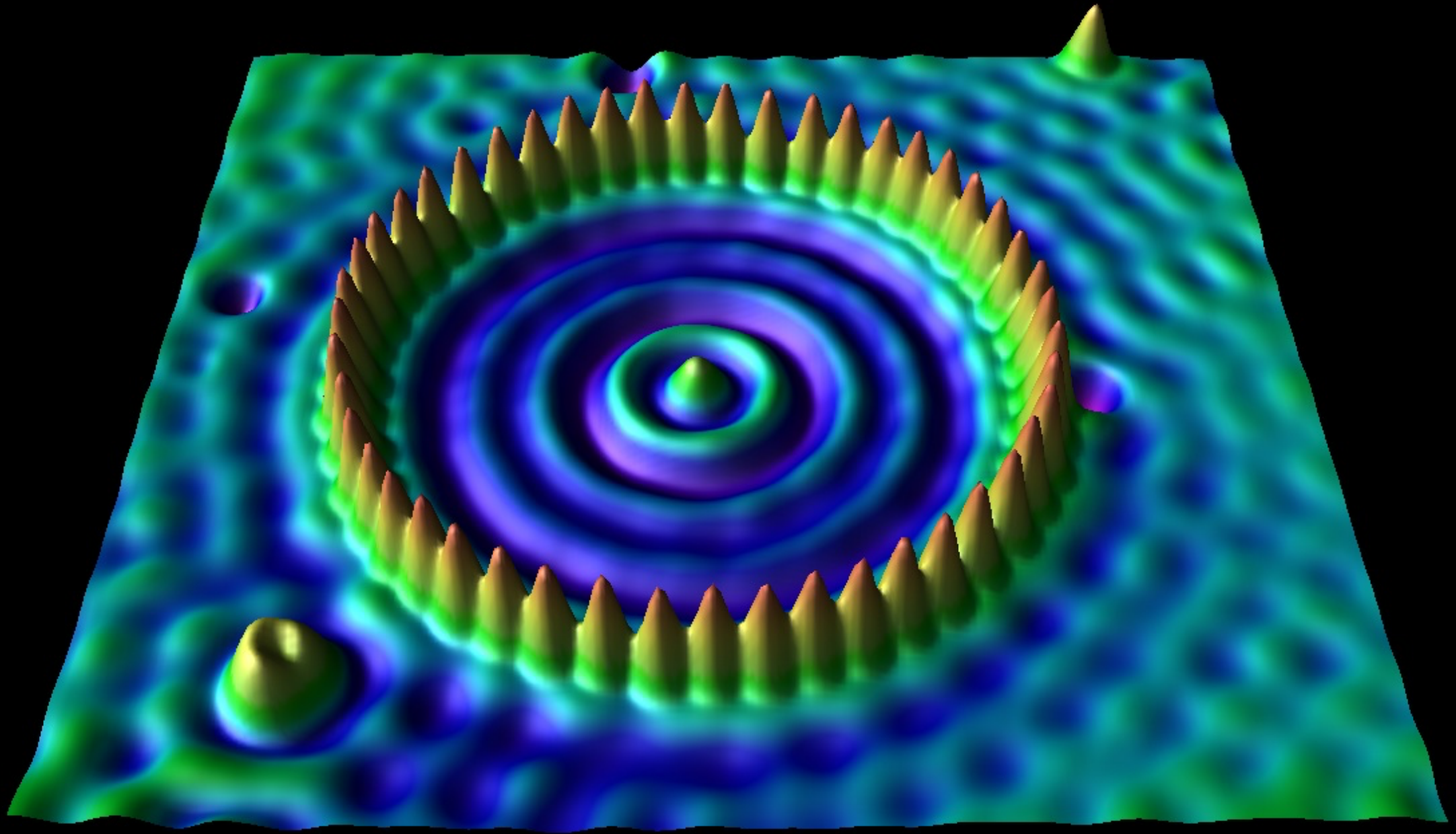
Natural electron traps (atoms & molecules)



Natural electron traps (atoms & molecules)

- Finding a particular color means finding the right trap
- Scavenger hunt
- What if we could make a trap? An 'artificial atom'?

Quantum corral





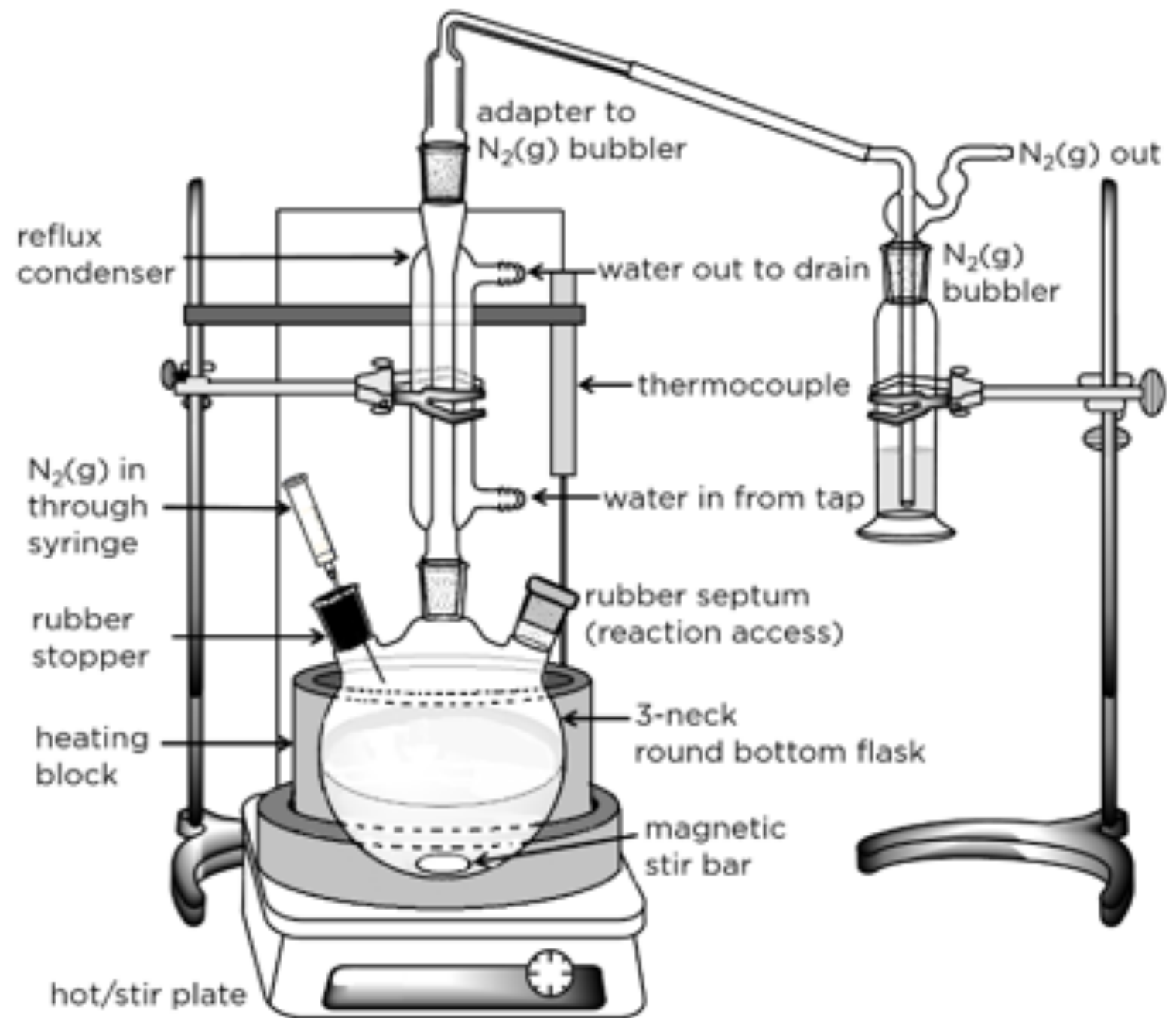
QUANTUM DOTS



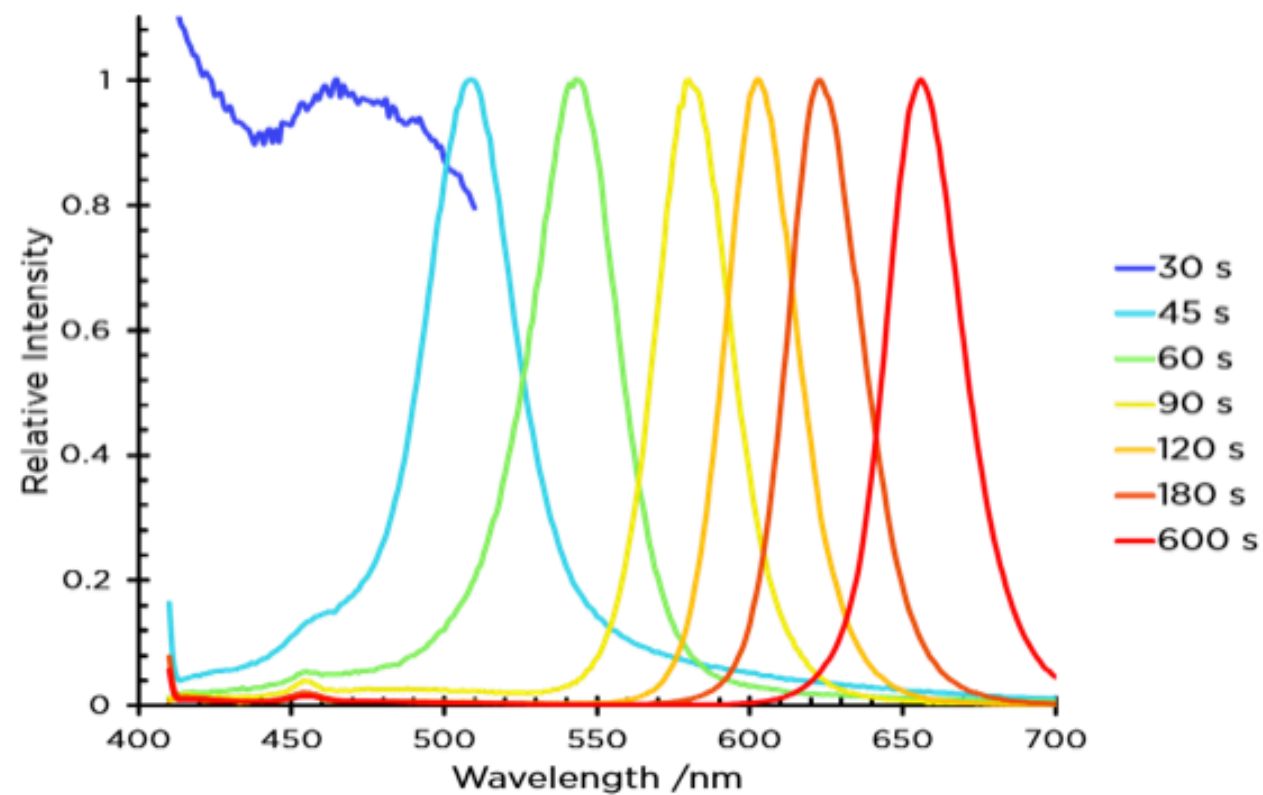
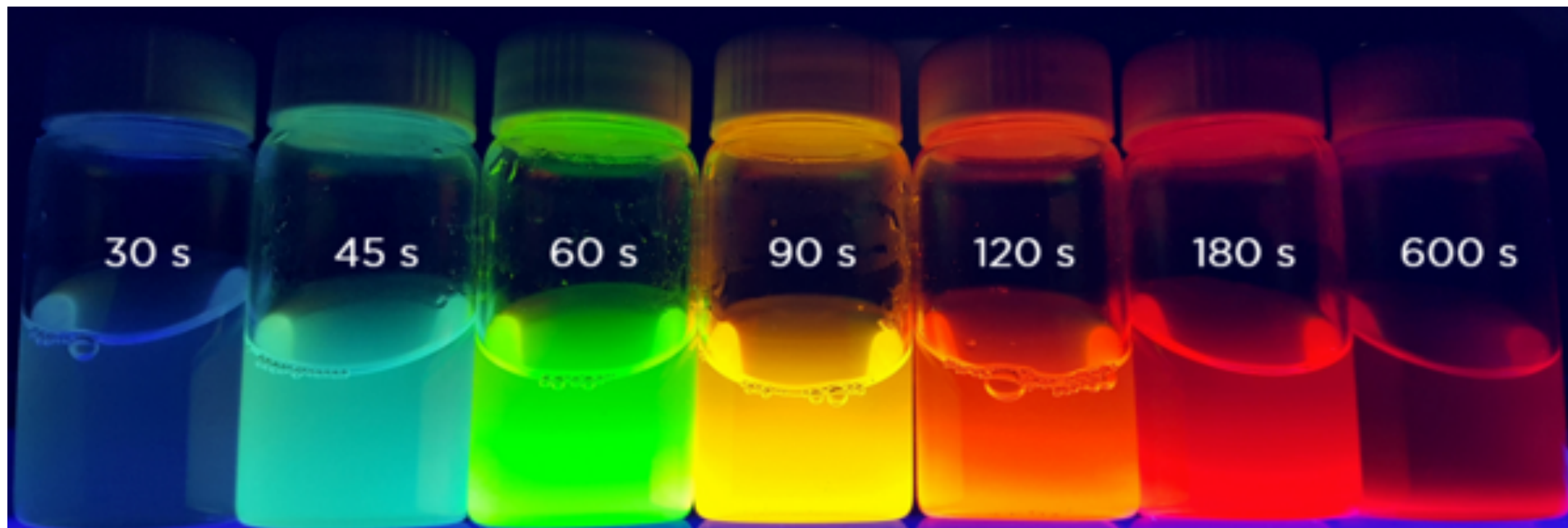
TARAN PREET SINGH (MS12044)

Making Cadmium Selenide QD

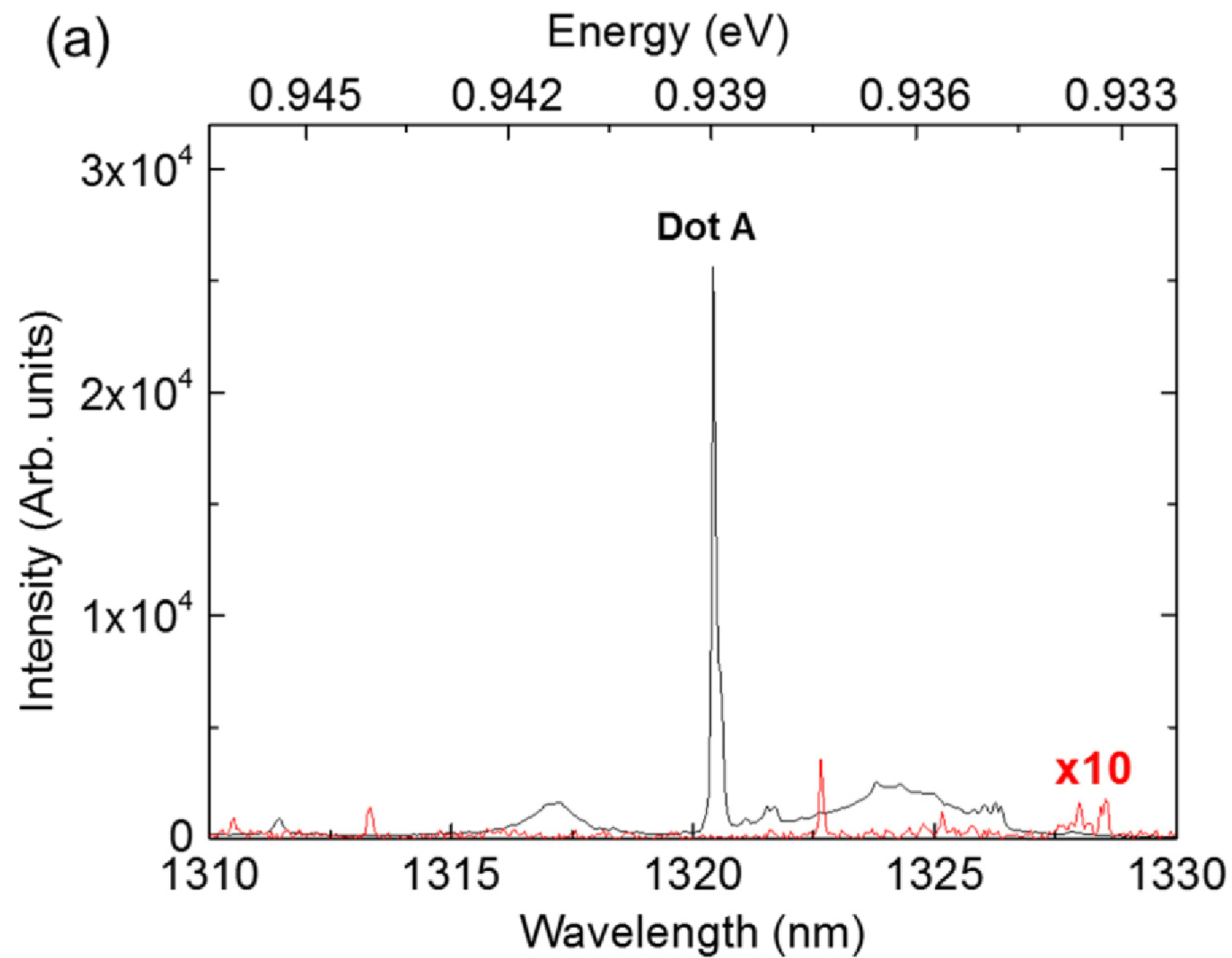
- Make a solution of Cadmium oxide
- At 250° C, add Selenium solution
- Small beads of Cadmium Selenide immediate start to grow
- Pull out samples with a pipet every few seconds



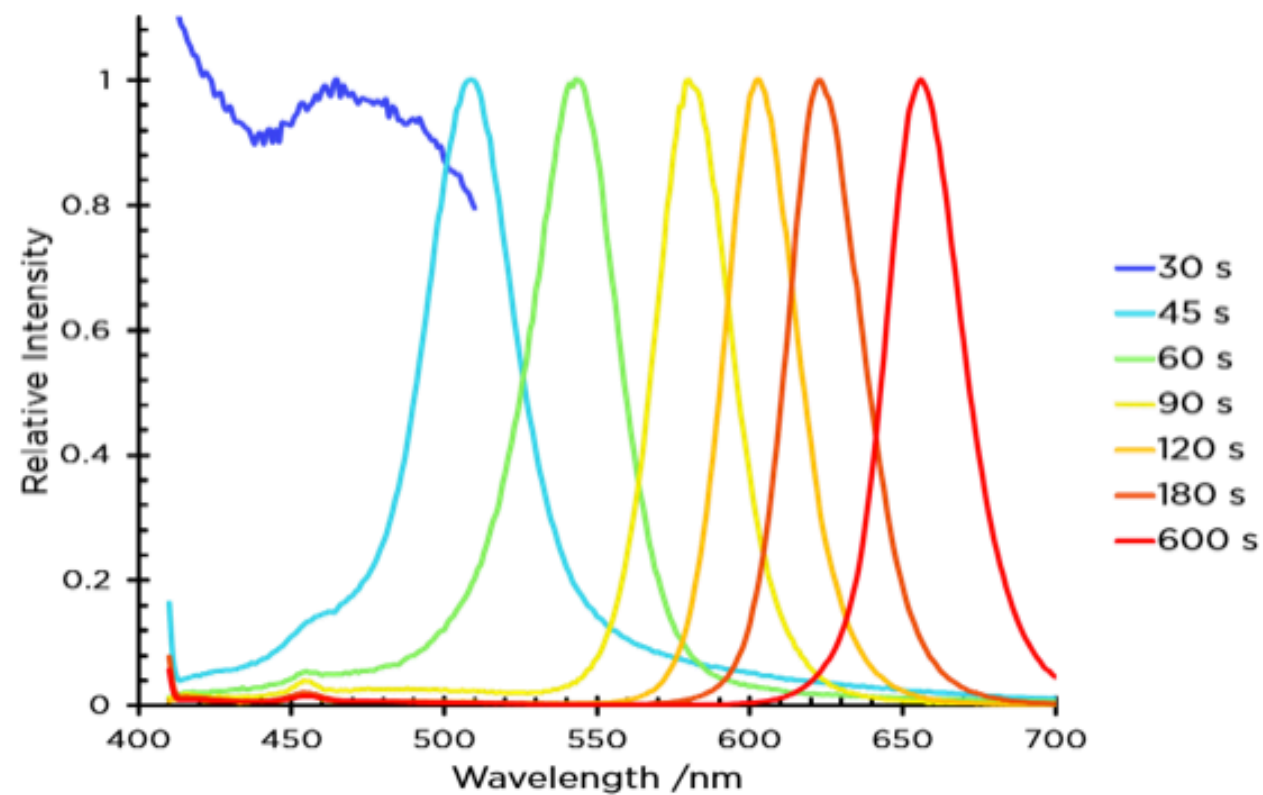
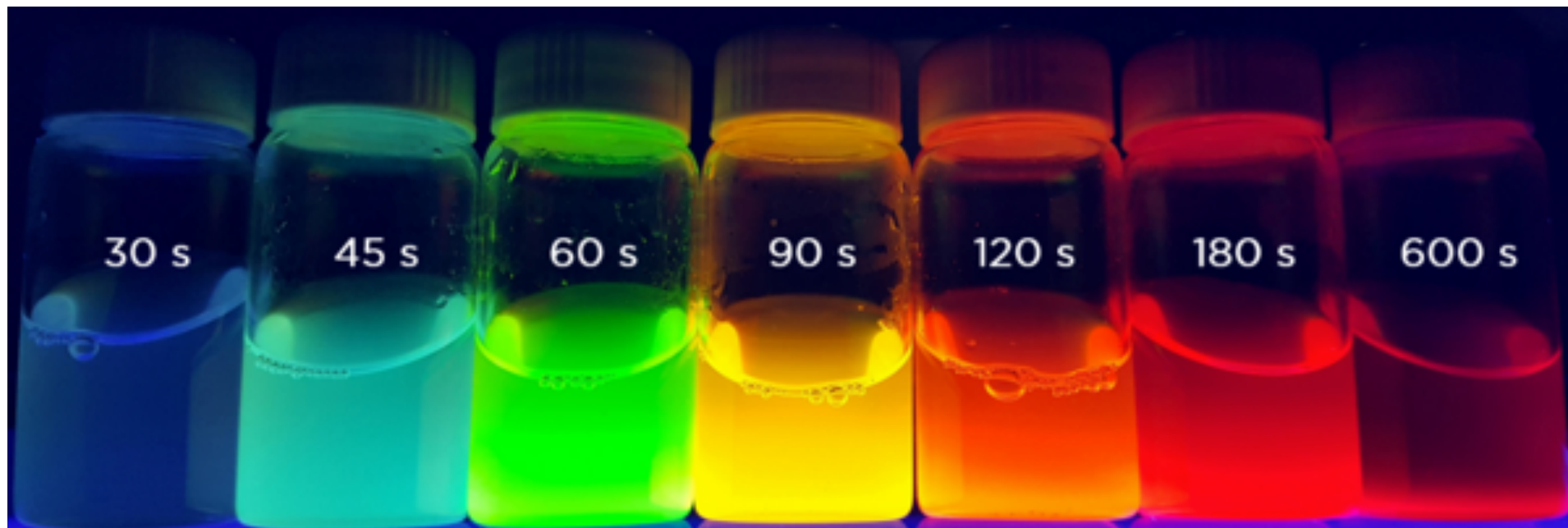
Making Cadmium Selenide QD



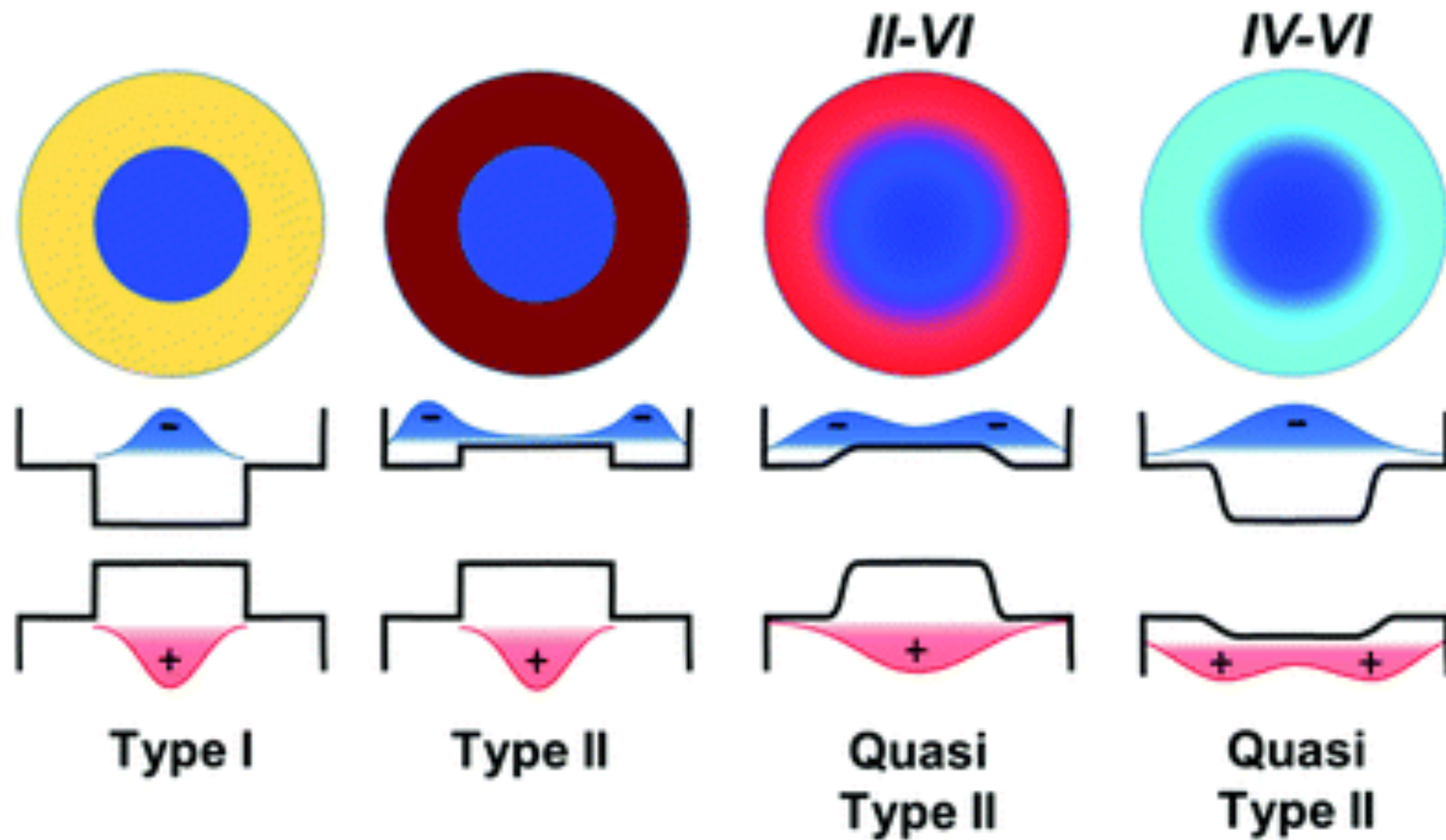
Single QD



Making Cadmium Selenide QD



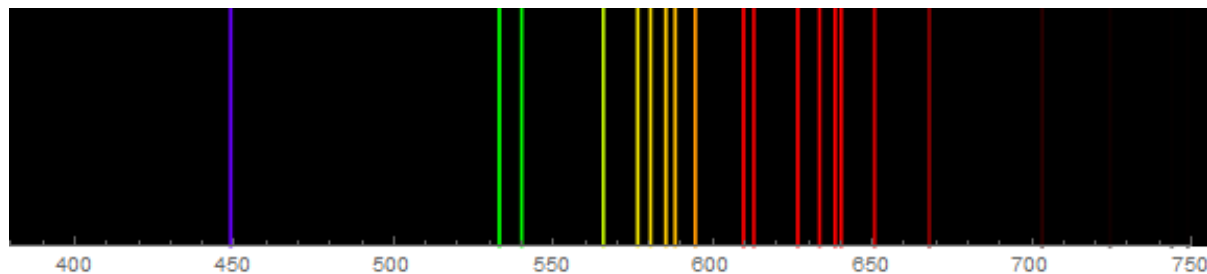
Two-layer beads



Natural vs. artificial traps

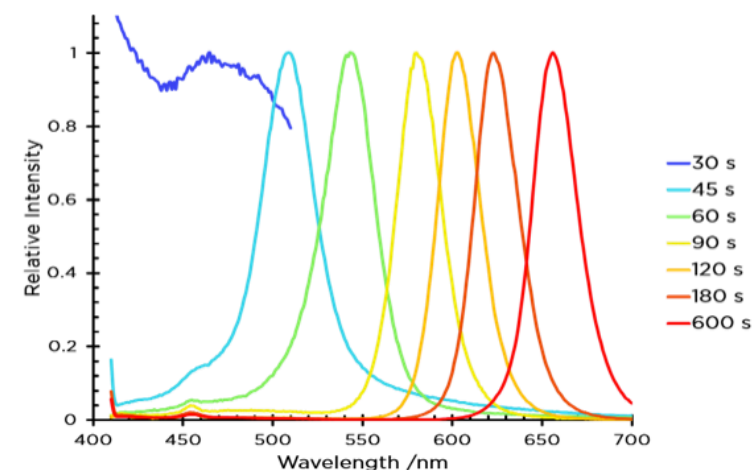
Natural

- Colors are what they are
- All traps of a type are identical (all neon atoms are identical)



Artificial (QD)

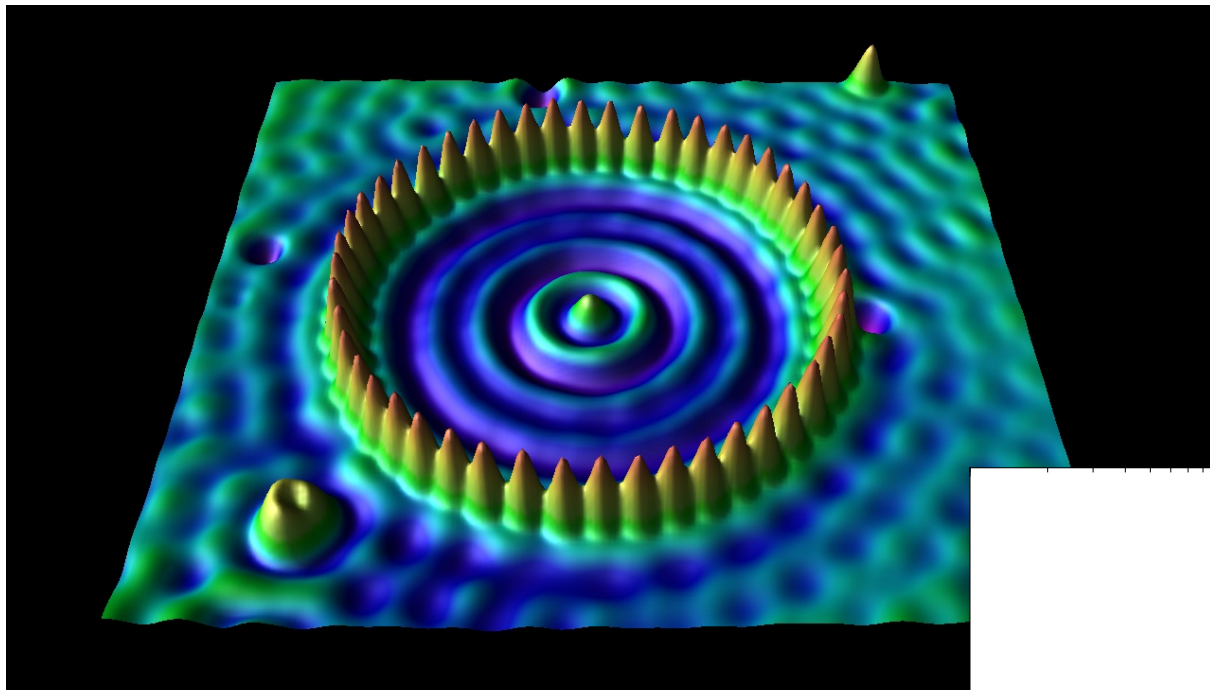
- Color can be tuned
- A variety of related traps is often unavoidable



Screens

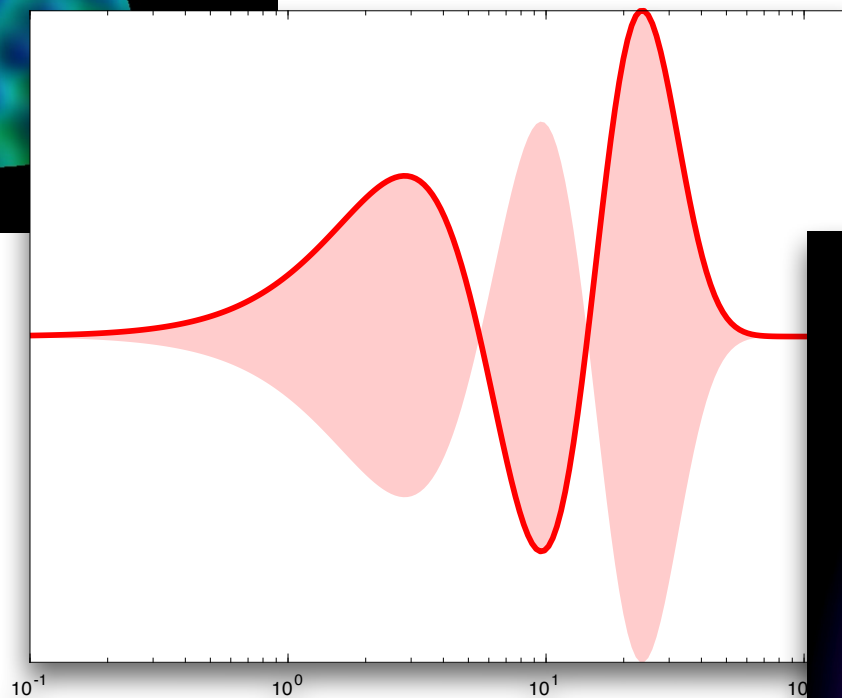


Electrons move as waves



Quantum
corral

Atom



Quantum dot

