Quantum dots
Natural electron traps (atoms & molecules)
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• Finding a particular color means finding the right trap

• Scavenger hunt

• What if we could make a trap? An ‘artificial atom’?
Quantum corral
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