

We study atoms because...

- Atoms are relatively simple



Good theoretical understanding of atoms
We can make models and calculations

- We can control them well by use of lasers



Extreme accuracy of measurements serve
as tests of our understanding

High-precision experiments provide tests of fundamental physics

- Fundamental constants – are they changing?
- General relativity
- Weak interaction q
- Quantum electrodynamics

How do we study atoms?

- Spectroscopy – the use of light emission and absorption to study matter
- First, we excite an atom using light
- Energy of a photon proportional to frequency (color); $E=h\nu$