Introduction to Atomic Physics

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Lectures - as movies available online, at anytime
Excersizes - remotely, Wednesday, 9:00 – 10:30
First lectures till October 16th
First excersizes: October 21st

Topics covered by the lecture:

1. The concept of atom.

2. Basic concepts of quantum mechanics.

3. Complete quantum description of the hydrogen atom: Shrodinger theory for one-electron atom, fine and hyperfine structure (Zeeman effect, Stern-Gerlach experiment, Einstein de-Hass effect, Lamb shift, nuclear magnetic resonance, ...).

4. Atoms with more than one electron: theoretical models for multielectron atoms, the helium atom, alkali atoms, exotic atoms.

5. Emission and absorption of electromagnetic radiation by atoms: transition probabilities, selection rules, lifetimes, spectral lines.

7. The periodic system.

8. Experimental techniques in atomic physics.

9. Modern developements in atomic physics: optical cooling and trapping of atoms, optical metrology (frequency comb, atomic clocks), new trends in quantum optics.

If you interested - send us email!

Bibliography:

- H. Haken, H. Ch. Wolf, The physics of atoms and quanta, 7th ed. Springer-Verlag, 2005
- C. J. Foot, Atomic Physics, Oxford University Press, 2005
- W. Demtroder, Atoms, molecules and photons, 3rd ed. Springer-Verlag, 2017
- J. L. Badevant, J. Dalibard, Quantum mechanics, Springer, 2002