

# Introduction to Atomic and Molecular Physics (2019 Fall)

Instructor: Shih-Kuang Tung (童世光); [zekest@phys.nthu.edu.tw](mailto:zekest@phys.nthu.edu.tw)

Office: Rm 413, Physics building.

Phone: (03)516-2582.

Time: Thursday 6:30pm – 9:20pm

Room: Rm 313, Physics building.

Suggested textbooks: *Atomic Physics* (by Christopher Foot) and *Atoms, Molecules, and Photons* (by Wolfgang Demtröder).

Grades: homework 70%; report 15%; presentation 15%.

Homework: there will be a homework assignment after selected topics.

## Topics:

1. Introduction to atomic and molecular physics (原子分子物理簡介)
2. Atomic structure (原子結構)
3. Atoms in external fields (原子結構在磁場和電場中的變化)
4. Photon-atom interactions (光子和原子的交互作用)
5. Laser cooling and trapping atoms (冷原子的實驗技術介紹)
6. Ion trap and cold ions (冷離子的實驗技術介紹)
7. Ultracold collisions (超冷原子的碰撞物理)
8. Degenerate Bose gas (量子玻色氣體)
9. Degenerate Fermi gas (量子費米氣體)
10. Quantum simulations (量子模擬)