

ISCCIA 2010: School syllabi

1. Laser Cooling and Trapping.....4 lectures (1hr 30m each)

Speakers: Prof. A. Browaeys

(a) Theory

Introduction to alkali atom structure and spectroscopy relevant to Laser Cooling and Trapping experiments.
General considerations for cooling and trapping
Light forces, electromagnetic traps
Doppler cooling
Sub-Doppler cooling
Evaporative cooling
 Low velocity binary collisions
 Low velocity tri-atomic collisions
Sympathetic cooling
 Collisional heating

(b) Techniques

Loading of traps
Different trapping mechanisms including optical traps
Cooling in traps
Overview of effective techniques
Detection of trapped and cooled atoms
 Absorption imaging
 Phase contrast imaging
 Correlation measurements