

Laser cooling of singly charged ions in a Penning trap

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The Penning Trap

Trap dimensions

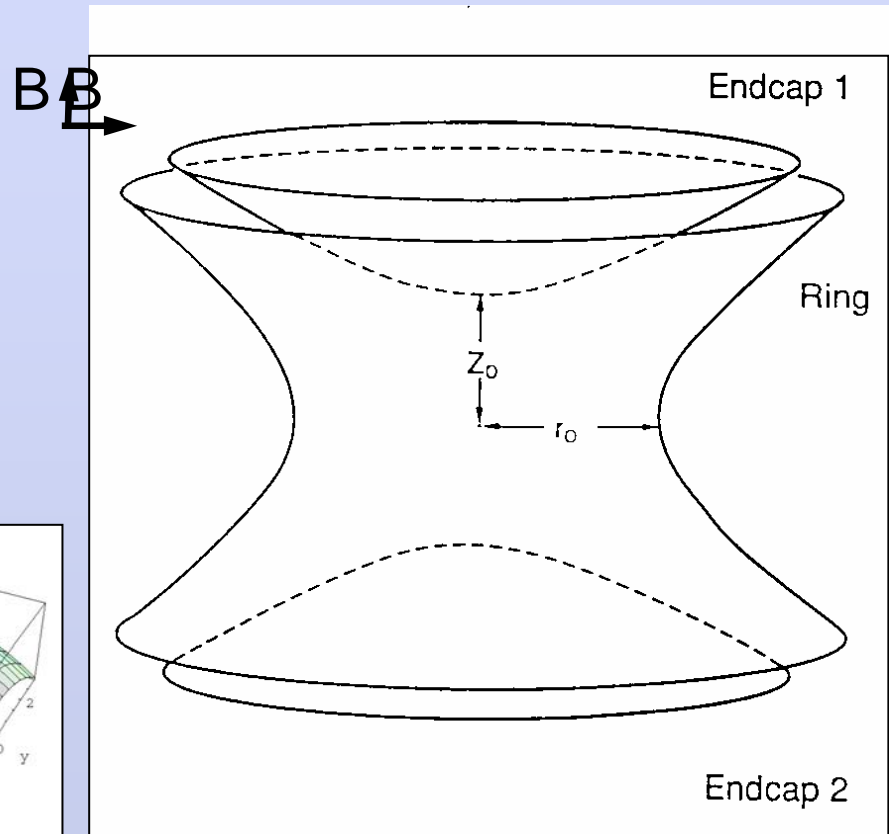
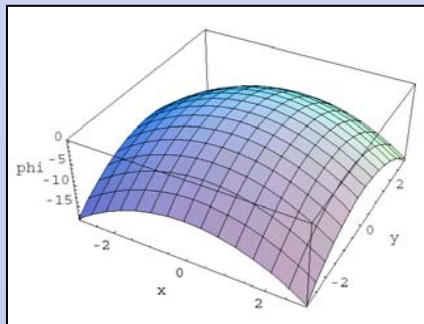
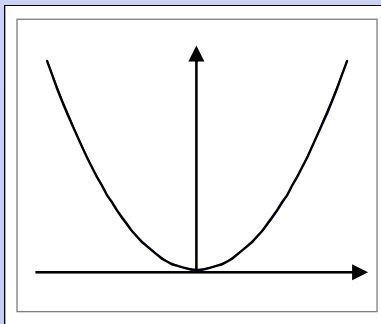
Trap length $2z_0 = 7\text{mm}$

Trap radius $r_0 = 5\text{mm}$

Typical field values

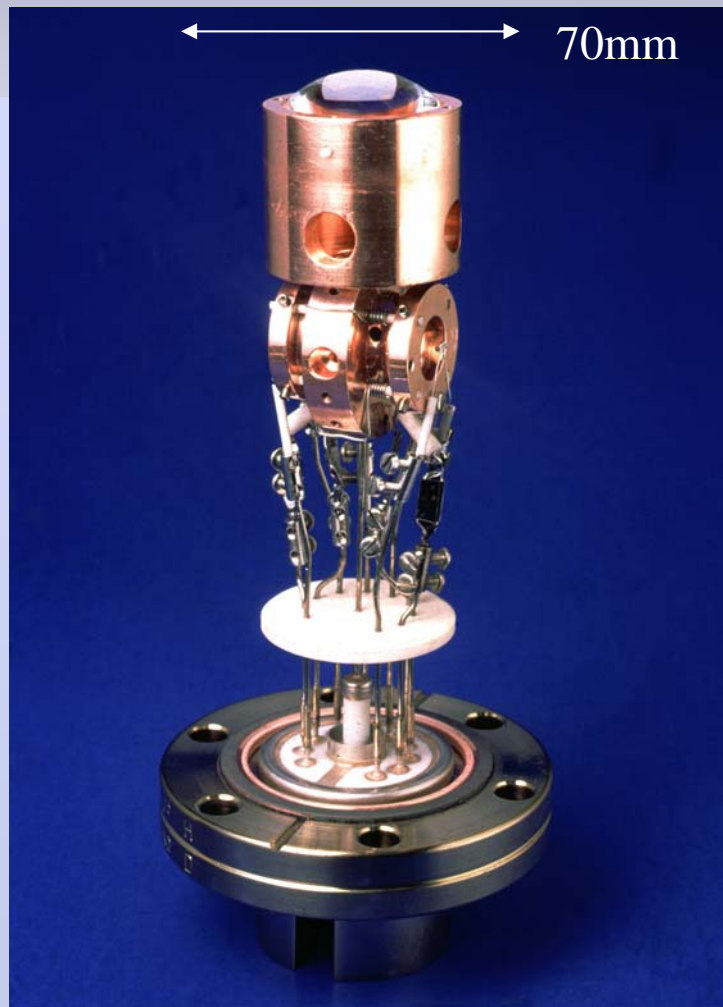
Magnetic field $B = 1\text{T}$

Electrode potential $U = 4\text{V}$

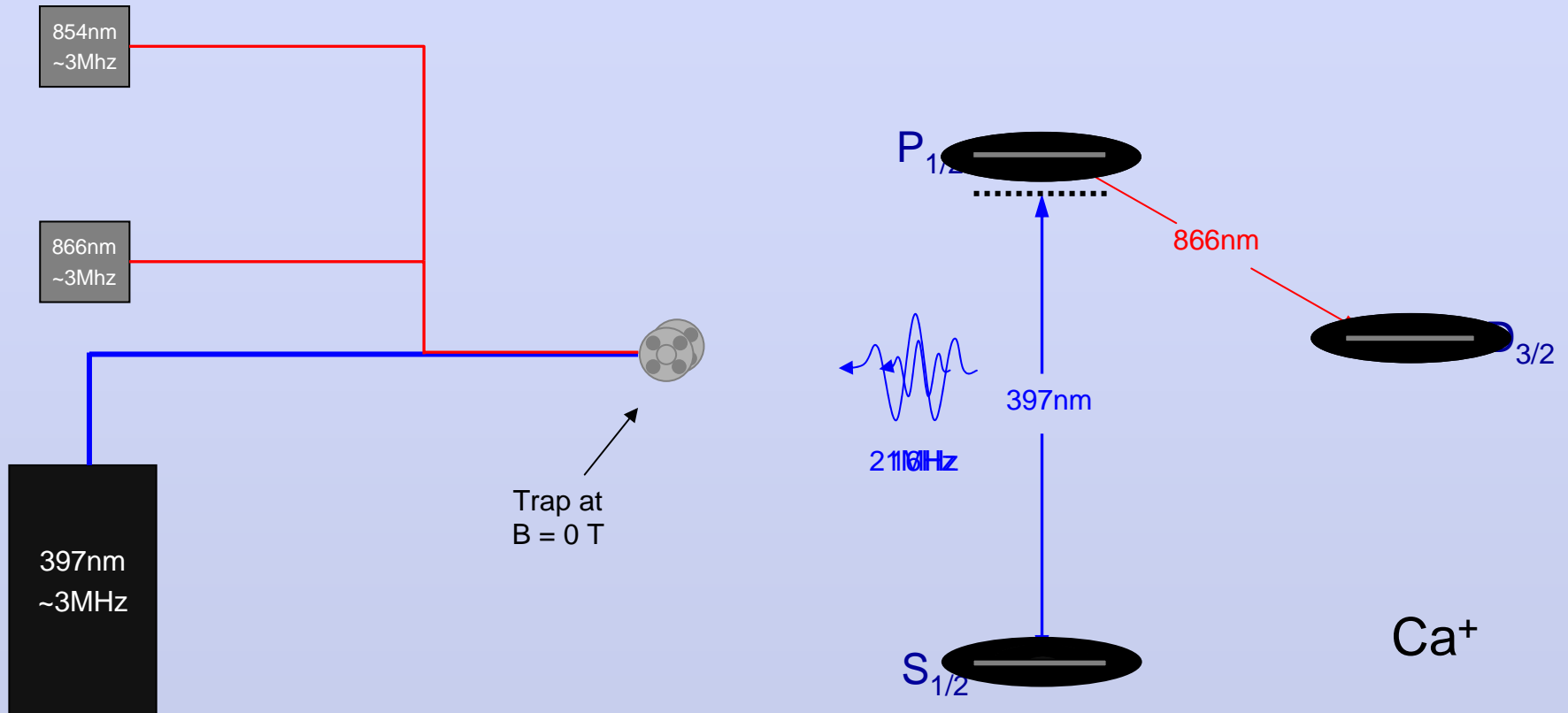


K. Dholakia et al Phys. Rev. A 47 (1993) 441-448

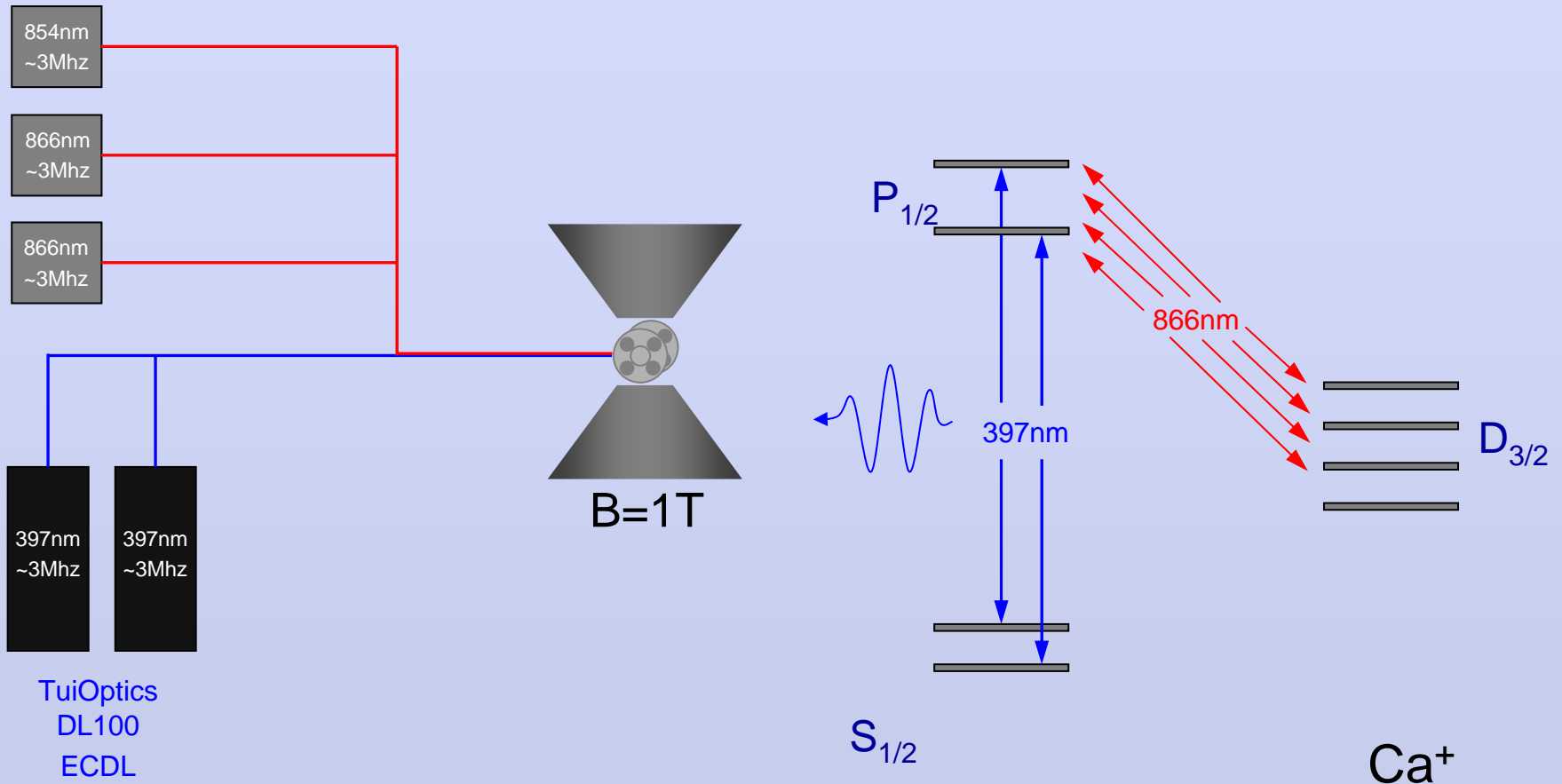
Detection



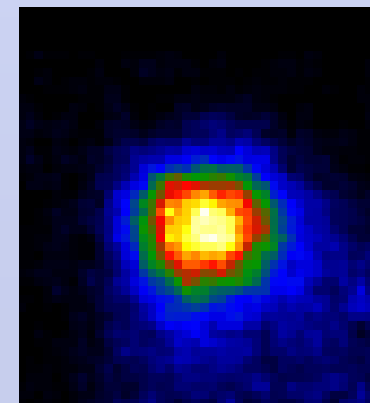
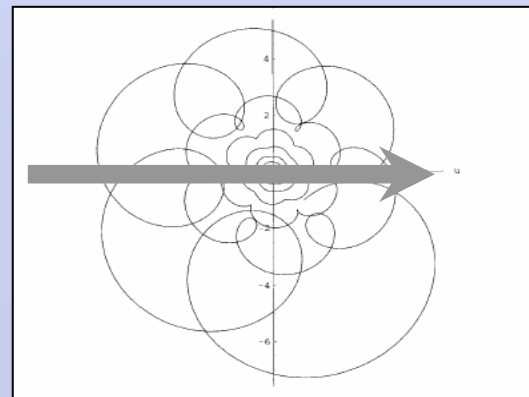
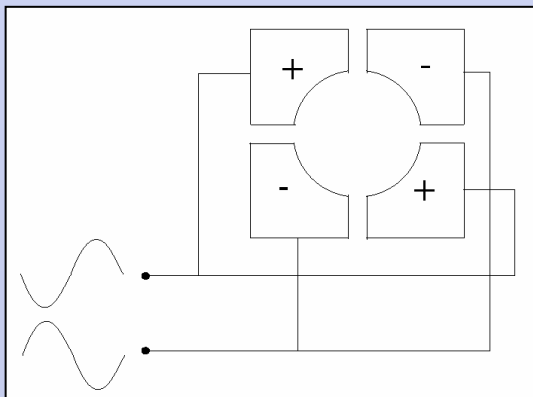
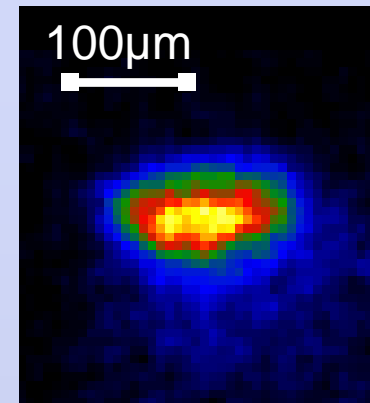
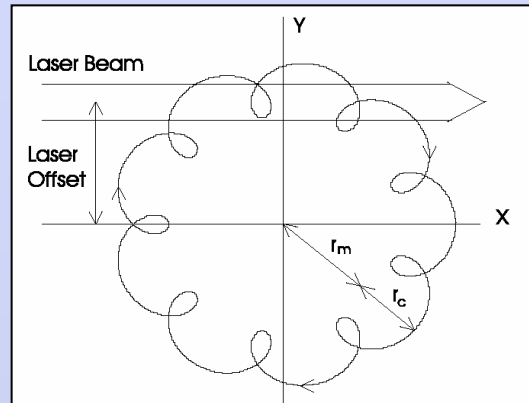
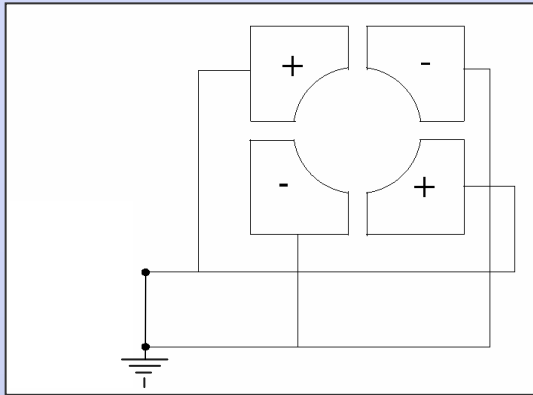
Laser Cooling Scheme



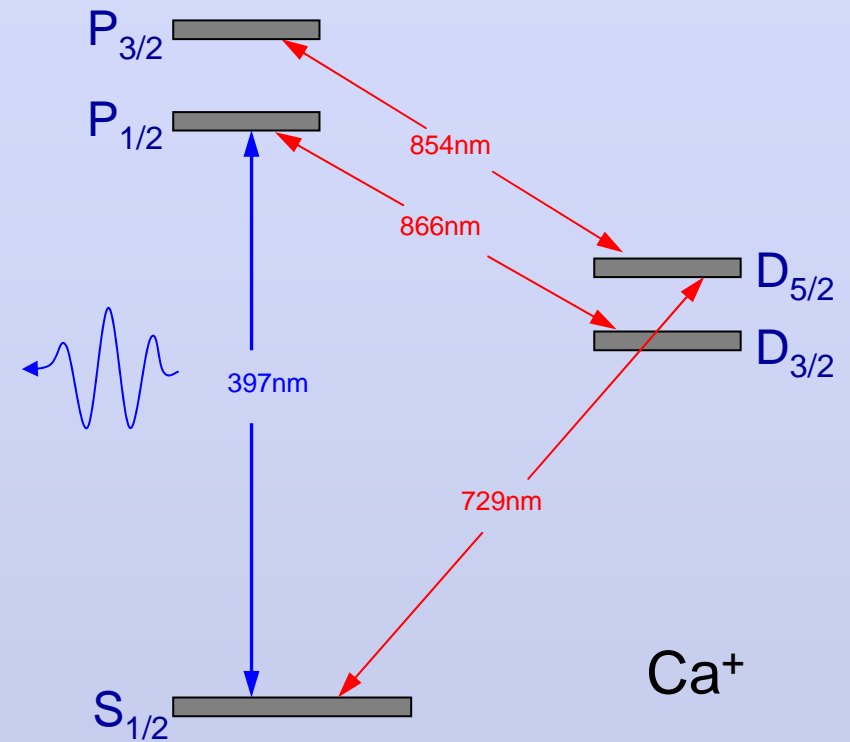
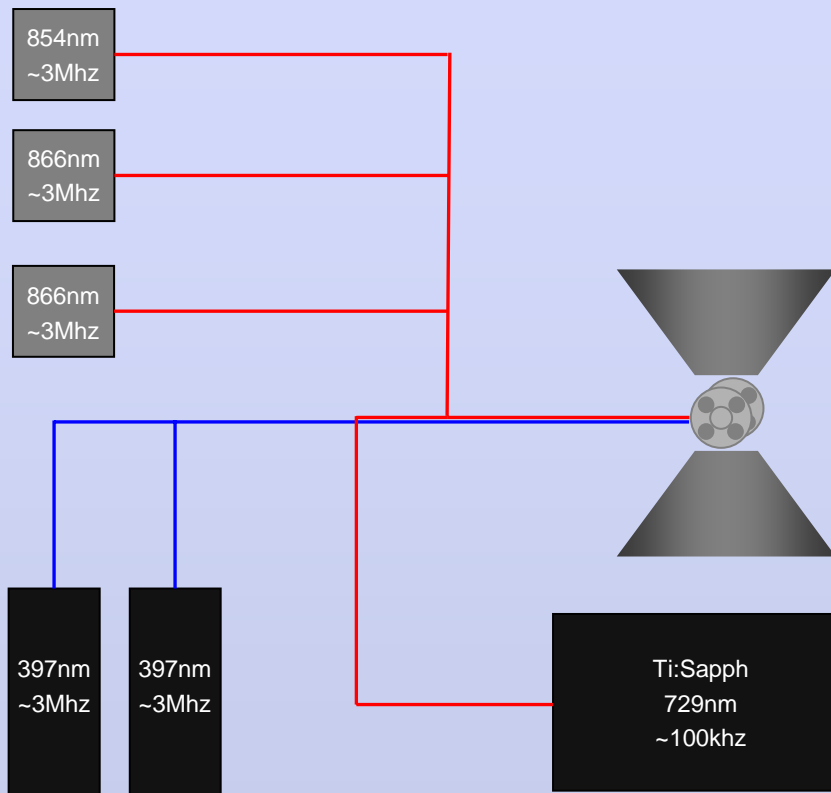
Laser Cooling Scheme



Axialisation



Quantum Information Processing



Thank You



Bakry Abdulla

Rich Hendricks

Danyal Winter

Eoin Phillips

Michael Chang

Danny Segal

Kingston Koo

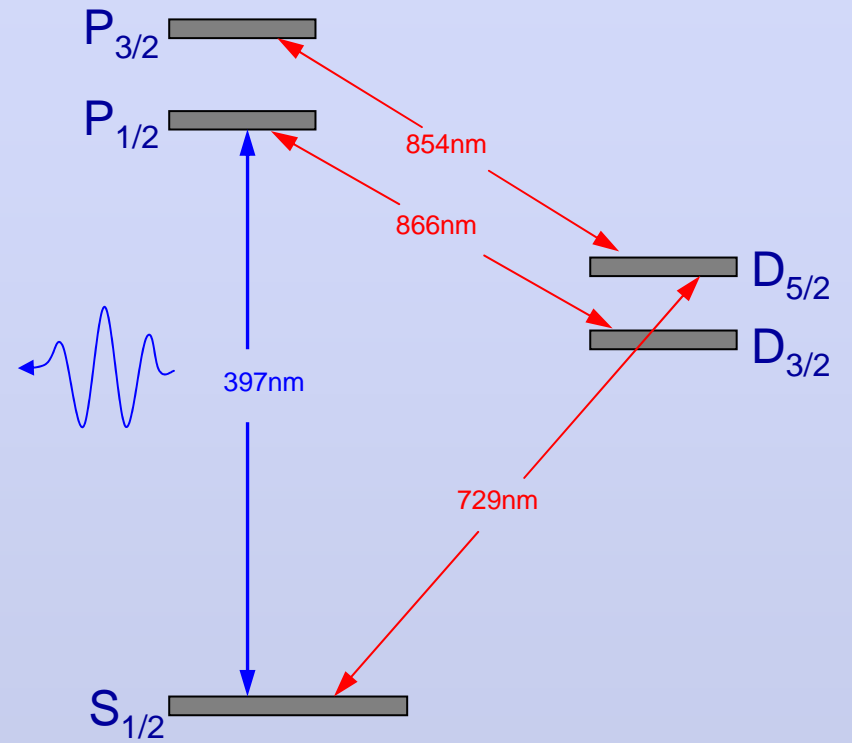
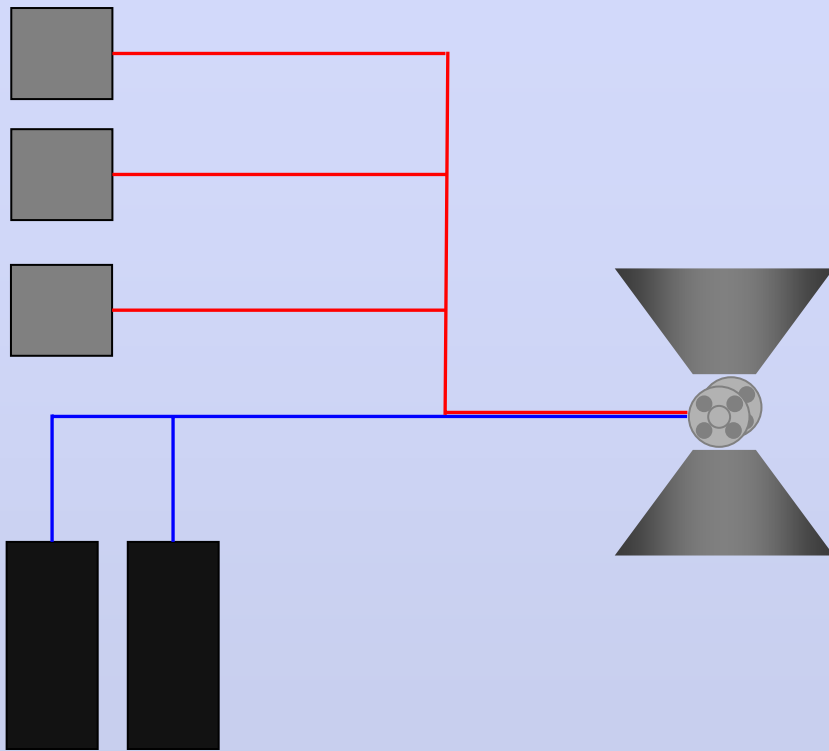
Hamid Ohadi

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Laser Cooling Scheme



The Blakett Laboratory Ion Trap Group

Members

- Prof Richard Thompson, Dr Danny Segal
- 3 PDRAs : D F Winters, K Koo, A Abdulla
- 4 PhDs : E Phillips, R Hendricks, H Ohadi
R Castrejón-Pita

Research

- Laser cooling of singly charged ions
- HITRAP participation (reword???)

Conclusions

Conclusions

- Add : Significance of work
- Add : Potential

Current work

- Investigation dynamical motions in the trap
- Reliable loading of single Ca^+ ions in a Penning trap

Future work

- Trapping in the superconducting magnet
- Qubit experiments
- Sideband cooling