Laser cooling of singly charged ions in a Penning trap

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The Penning Trap

Trap dimensions

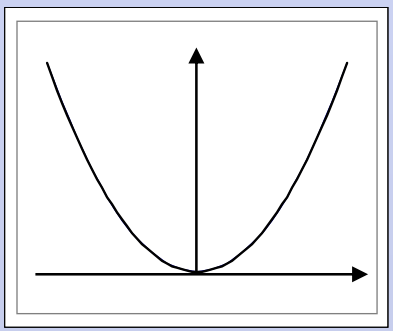
Trap length $2z_0 = 7mm$

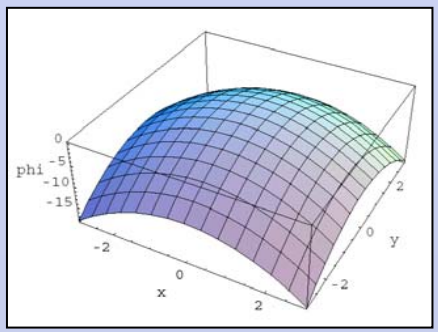
Trap radius $r_0 = 5mm$

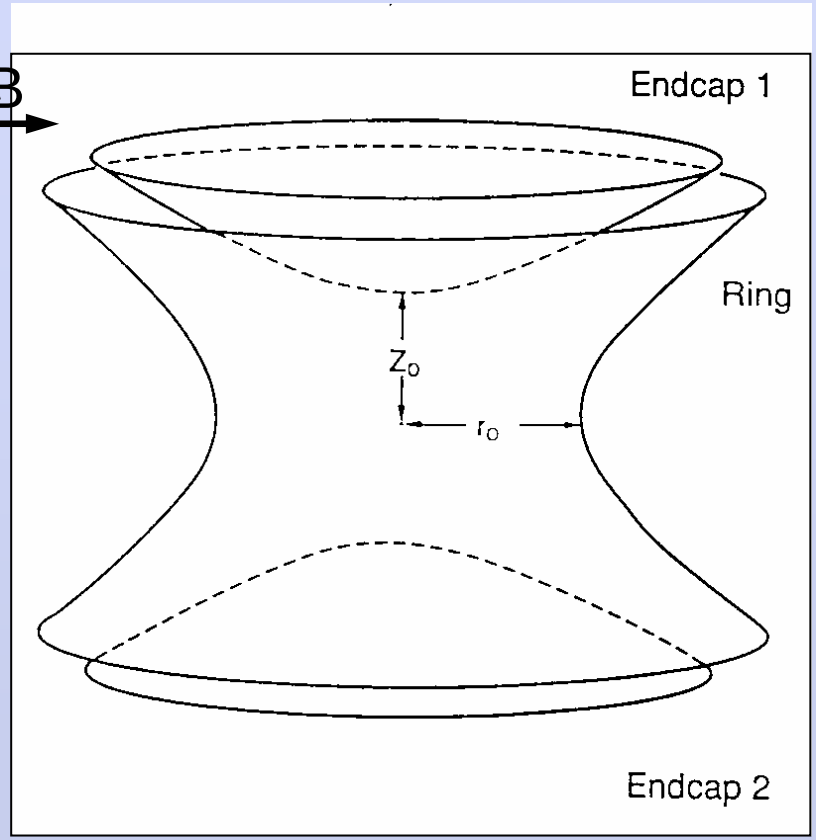
Typical field values

Magnetic field $B = 1T$

Electrode potential $U = 4V$







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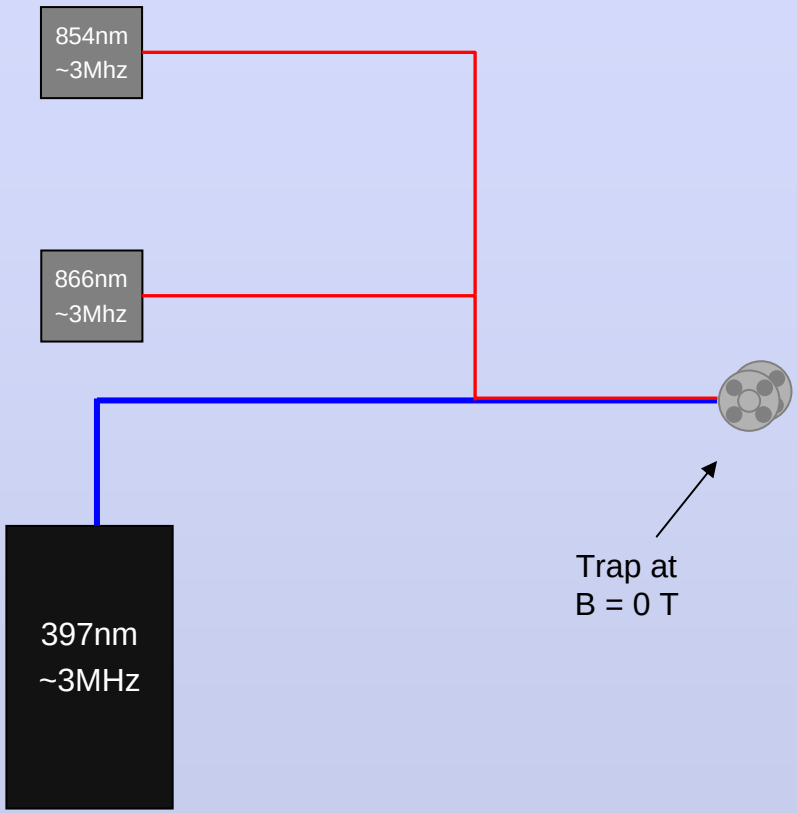
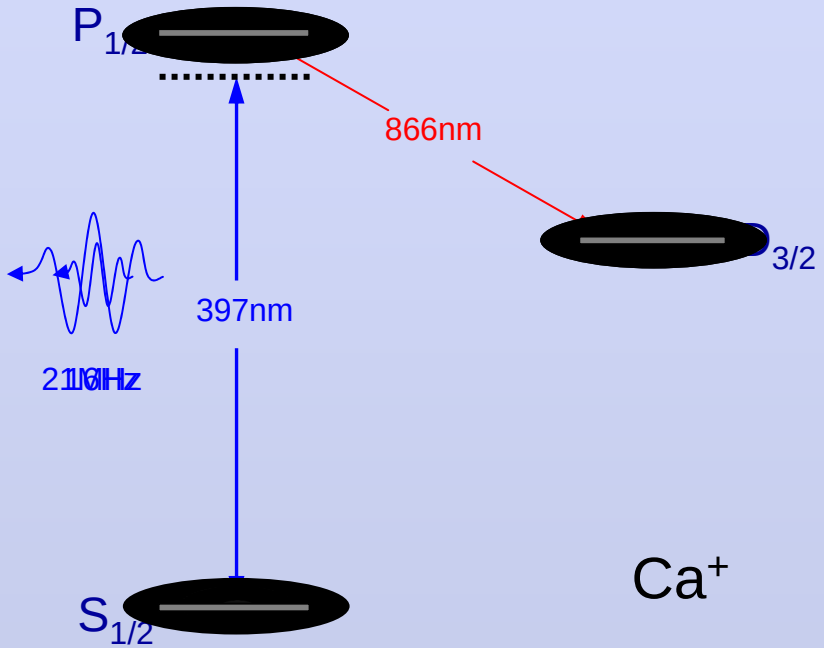
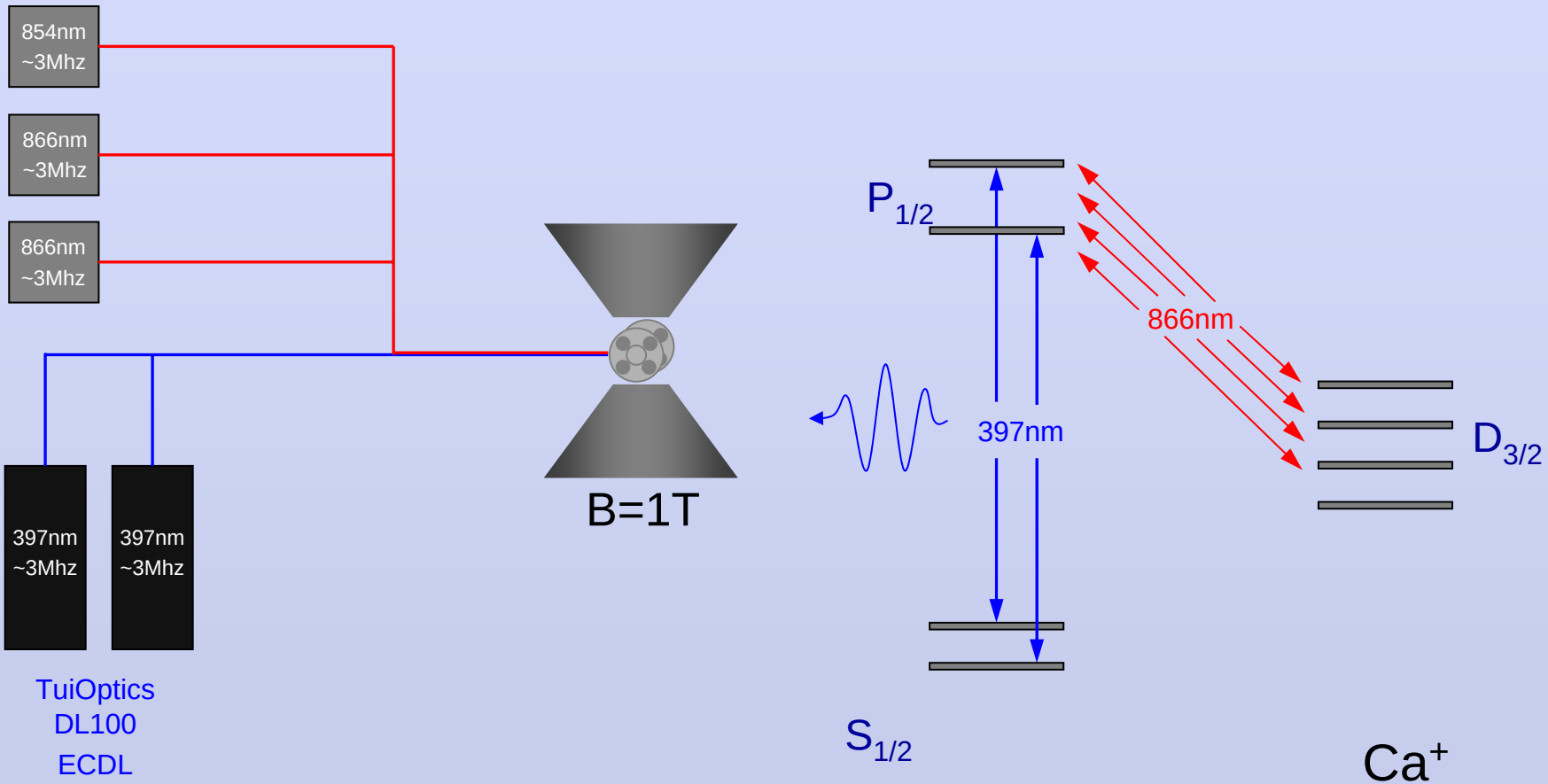
Detection

Laser Cooling Scheme

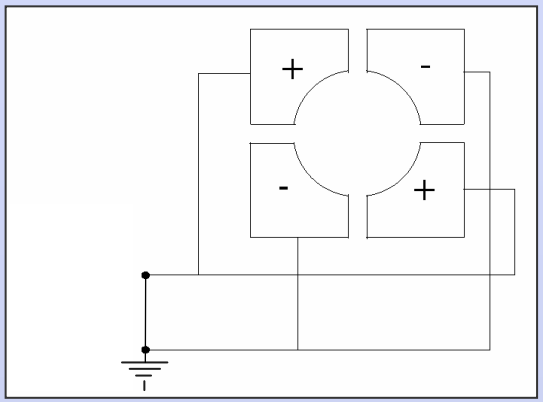


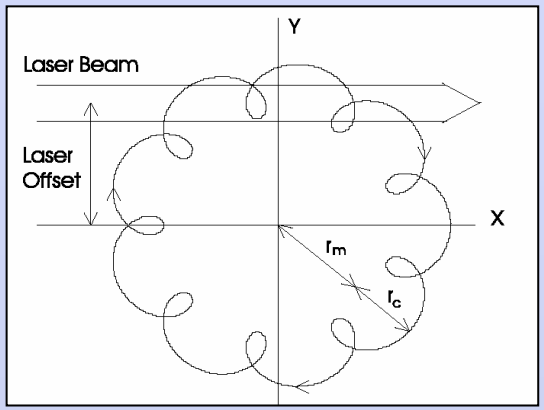


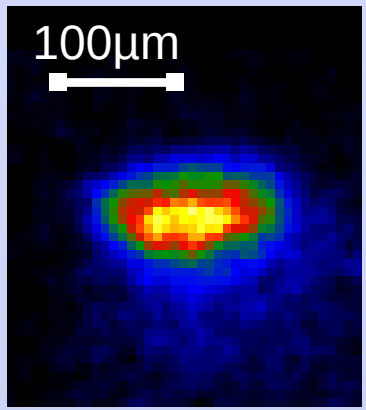
Laser Cooling Scheme

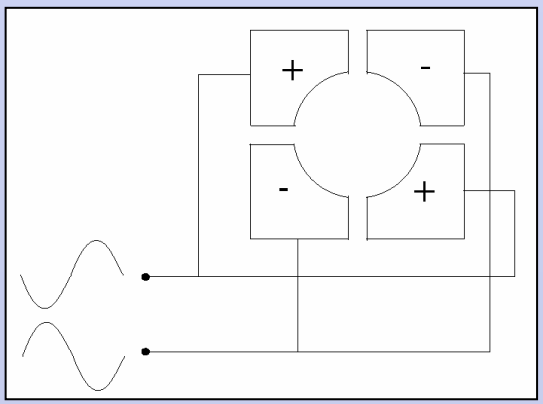


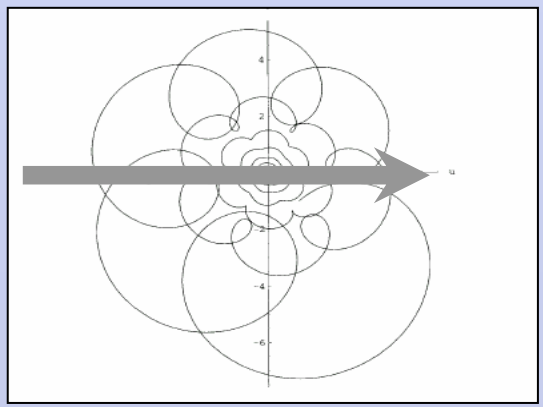
Axialisation

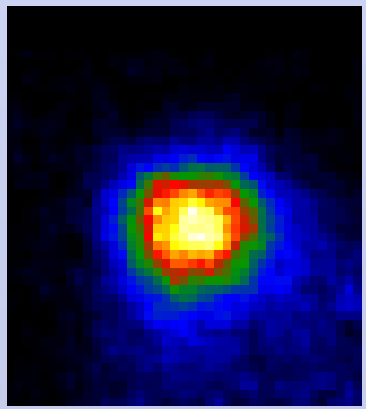




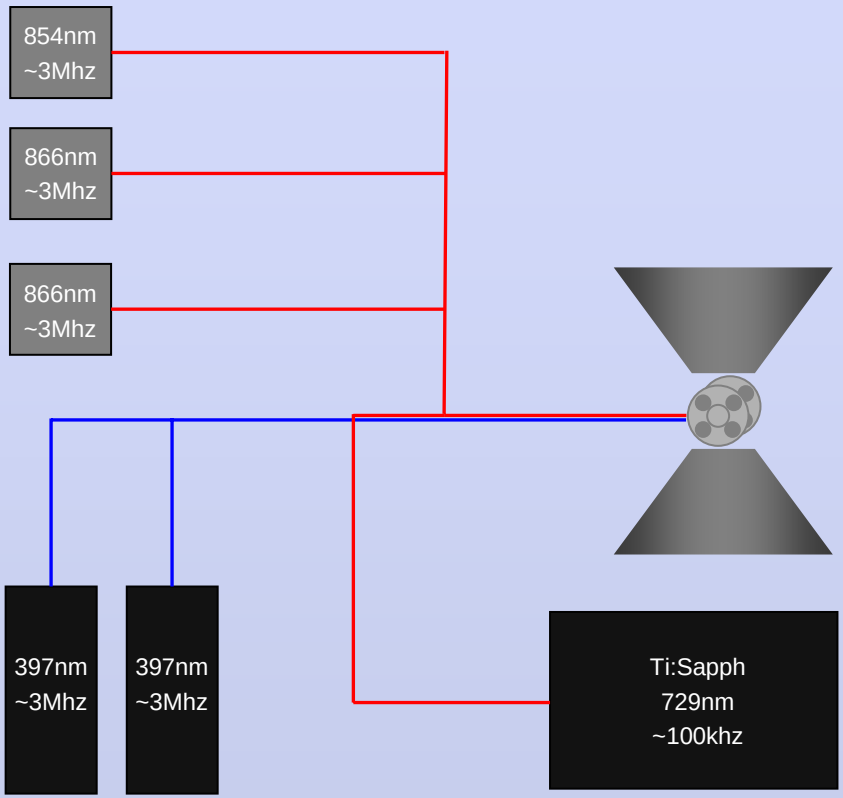


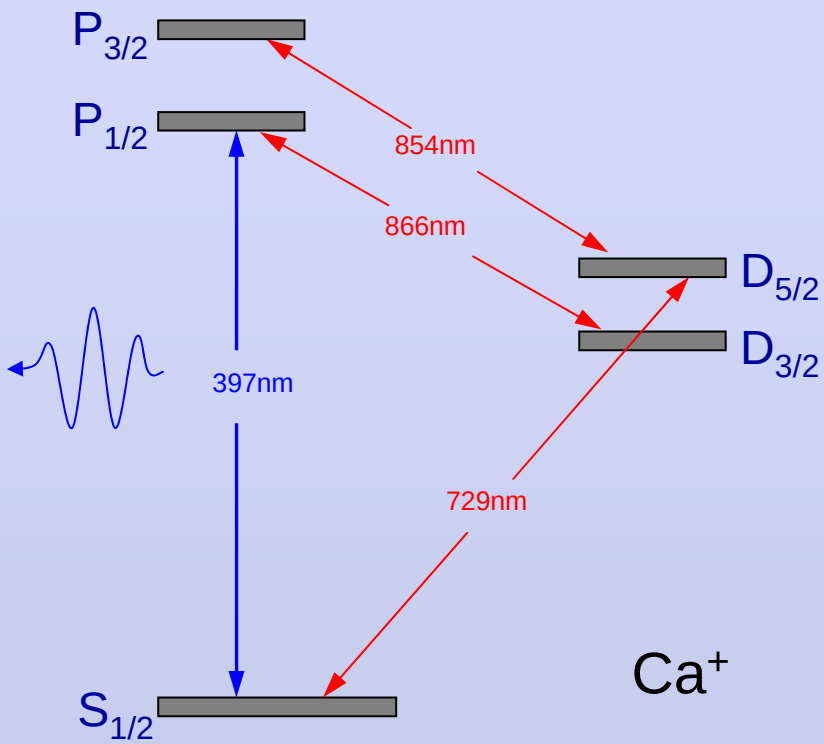






Quantum Information Processing



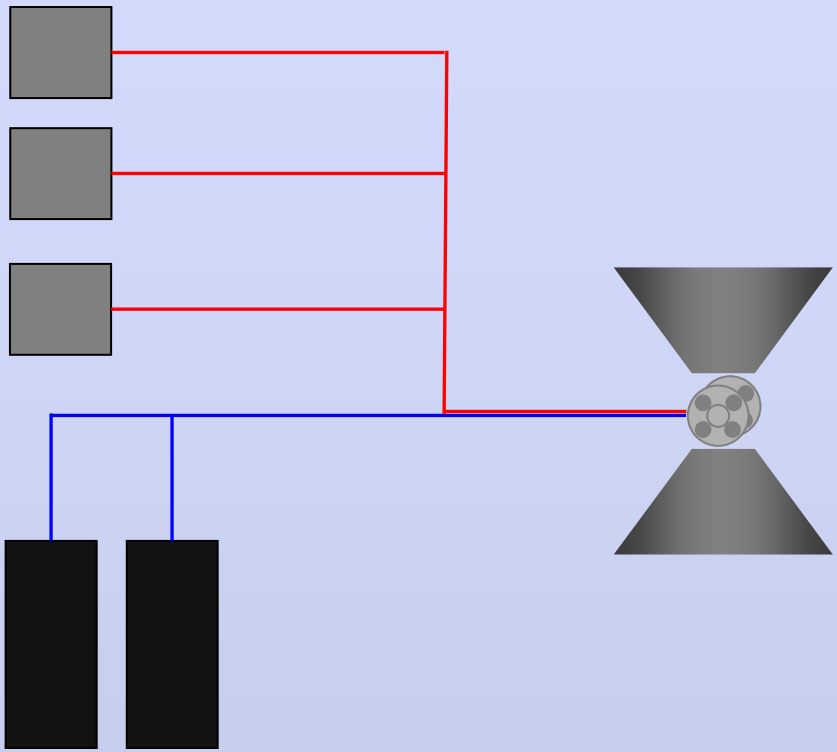


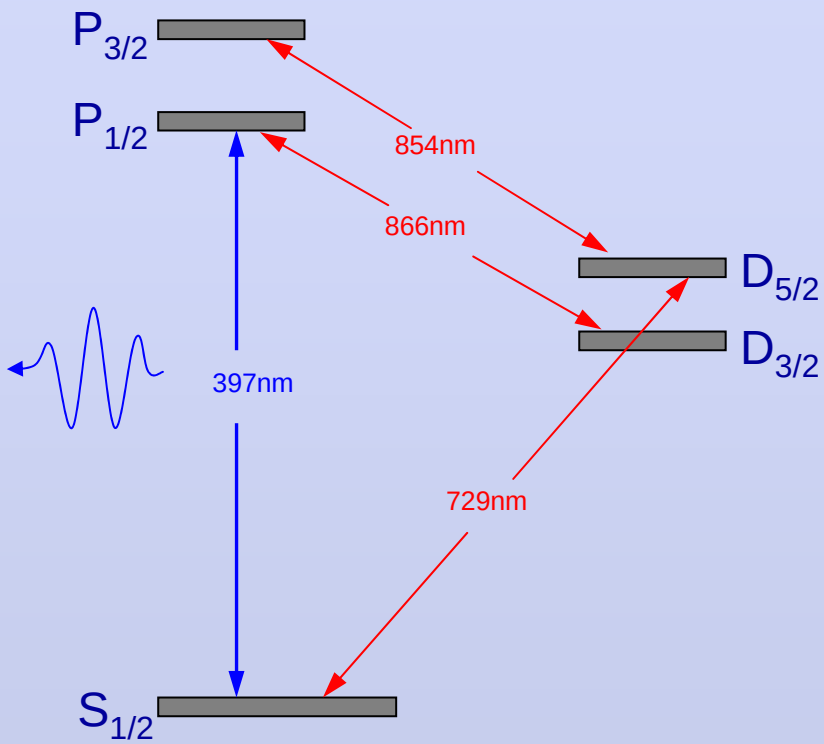
Thank You

Bakry Abdulla **Rich Hendricks** **Danyal Winter** **Eoin Phillips** Michael Chang **Danny Segal**

Kingston Koo **Hamid Ohadi** **Rafael Castrejon-Pita** **RichardThompson** Enguerrand Menard

Laser Cooling Scheme





The Blackett 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