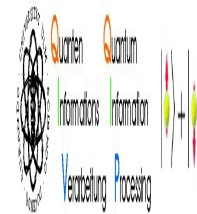


Laser cooled trapped ions



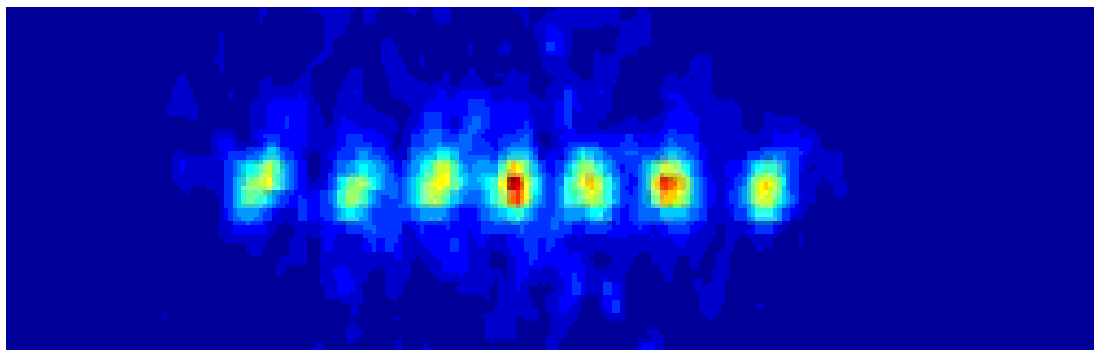
F. Schmidt -Kaler

Universität Innsbruck,
Experimentalphysik,
<http://heart-c704.uibk.ac.at>



Quantum
Information
Processing

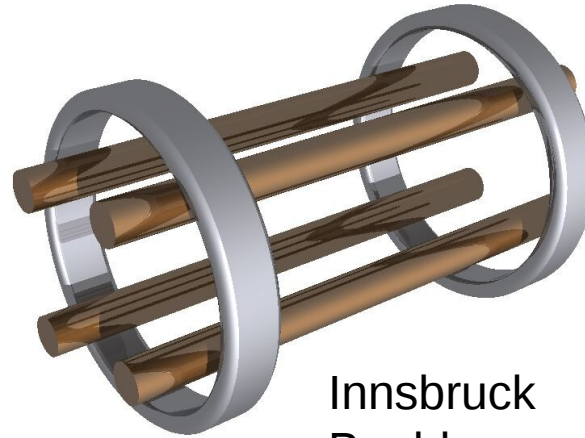
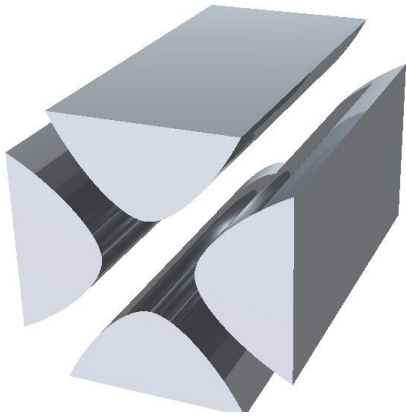
Universität Ulm
QuantenInformationsVerarbeitung
D-89069 Ulm



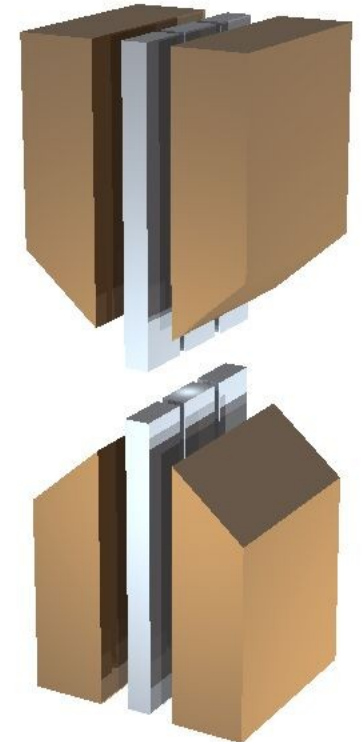
coherent breathing motion
of a 7-ion linear crystal

Linear ion traps

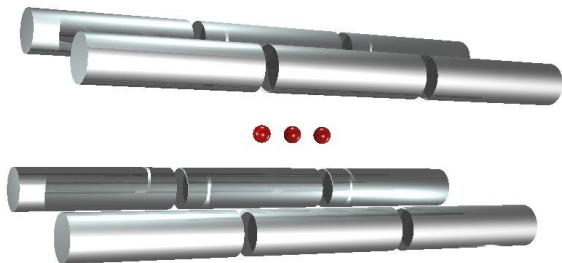
Paul mass filter



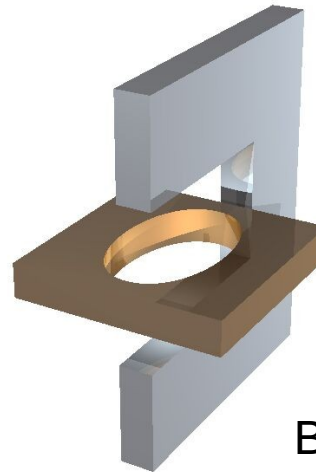
Innsbruck
Boulder
Los Alamos



München

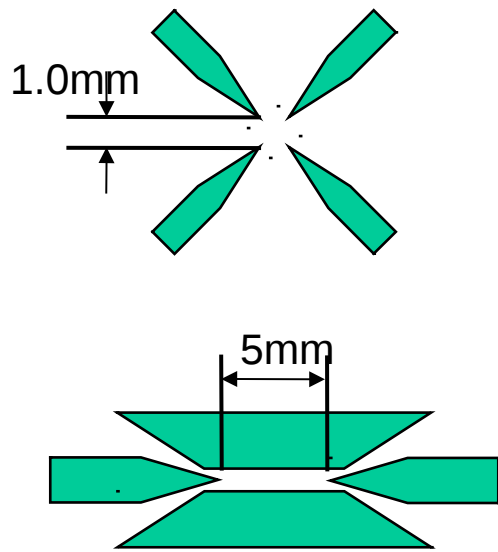


Boulder, Mainz, Aarhus

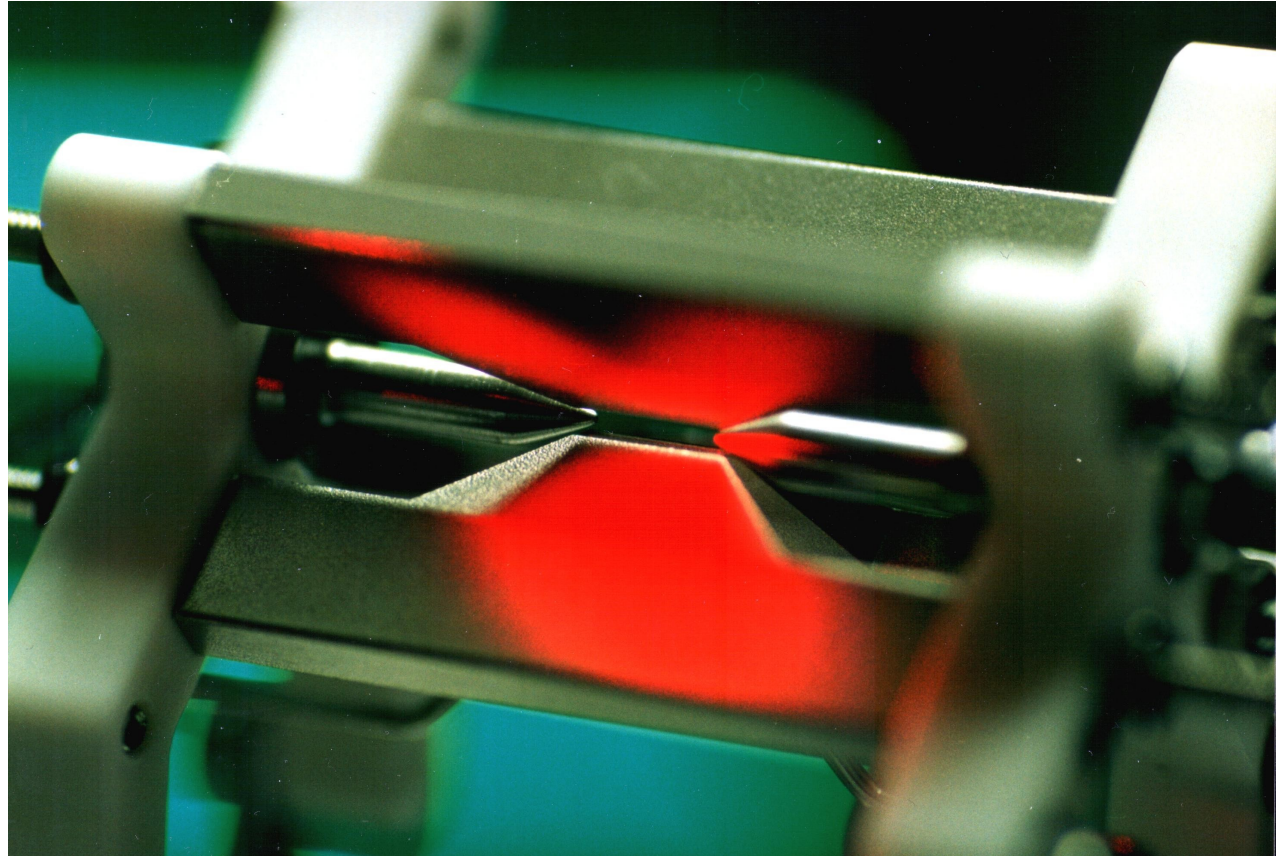


Boulder

Innsbruck linear ion trap



Blade design

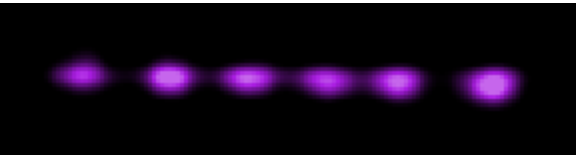


$$\omega_{axial} \approx 0.7 - 2 \text{ MHz}$$

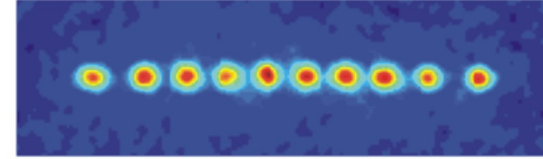
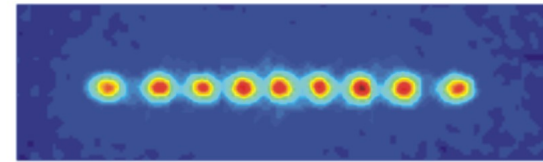
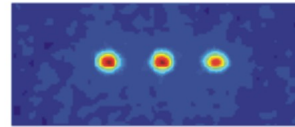
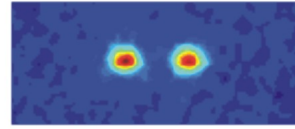
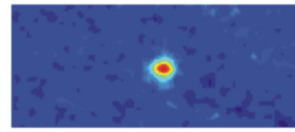
$$\omega_{radial} \approx 5 \text{ MHz}$$

$$\text{trap depth} \approx eV$$

Cold ion crystals

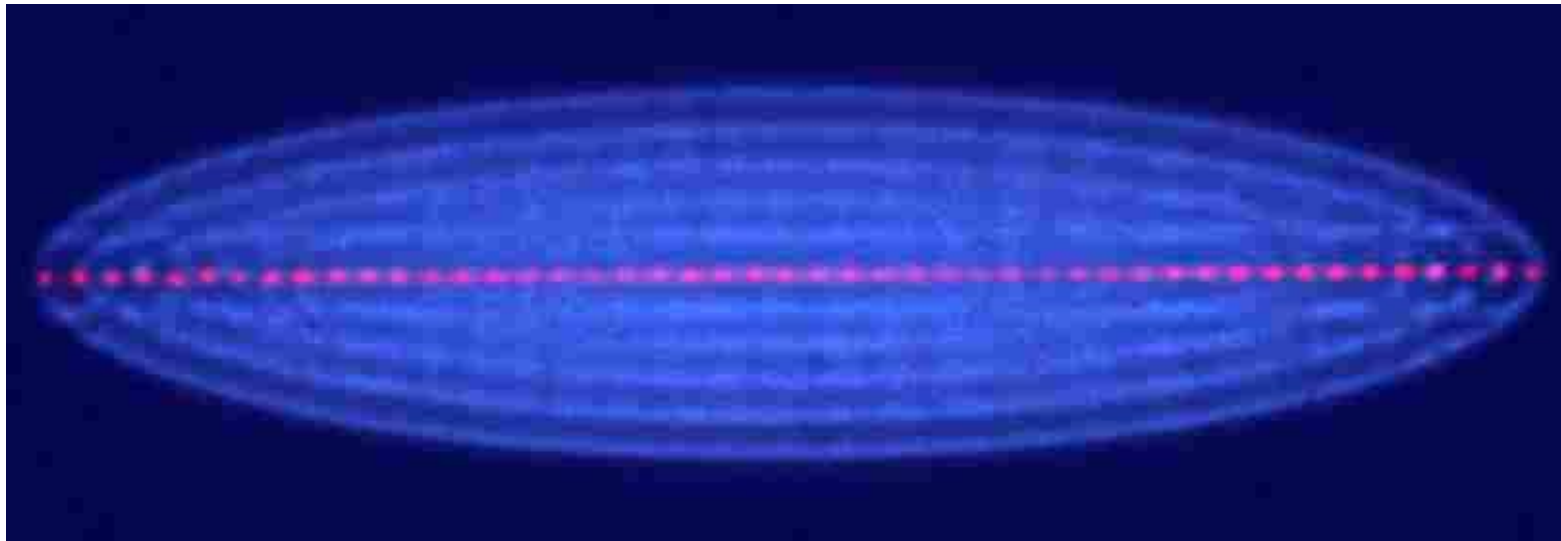
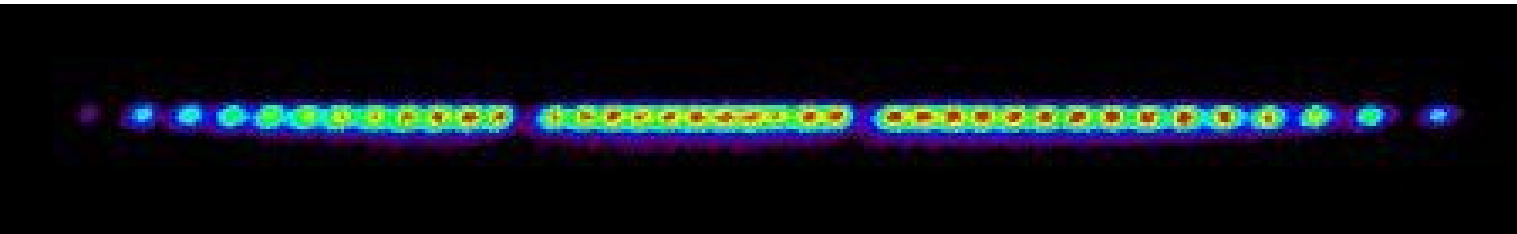


Oxford, England: $^{40}\text{Ca}^+$



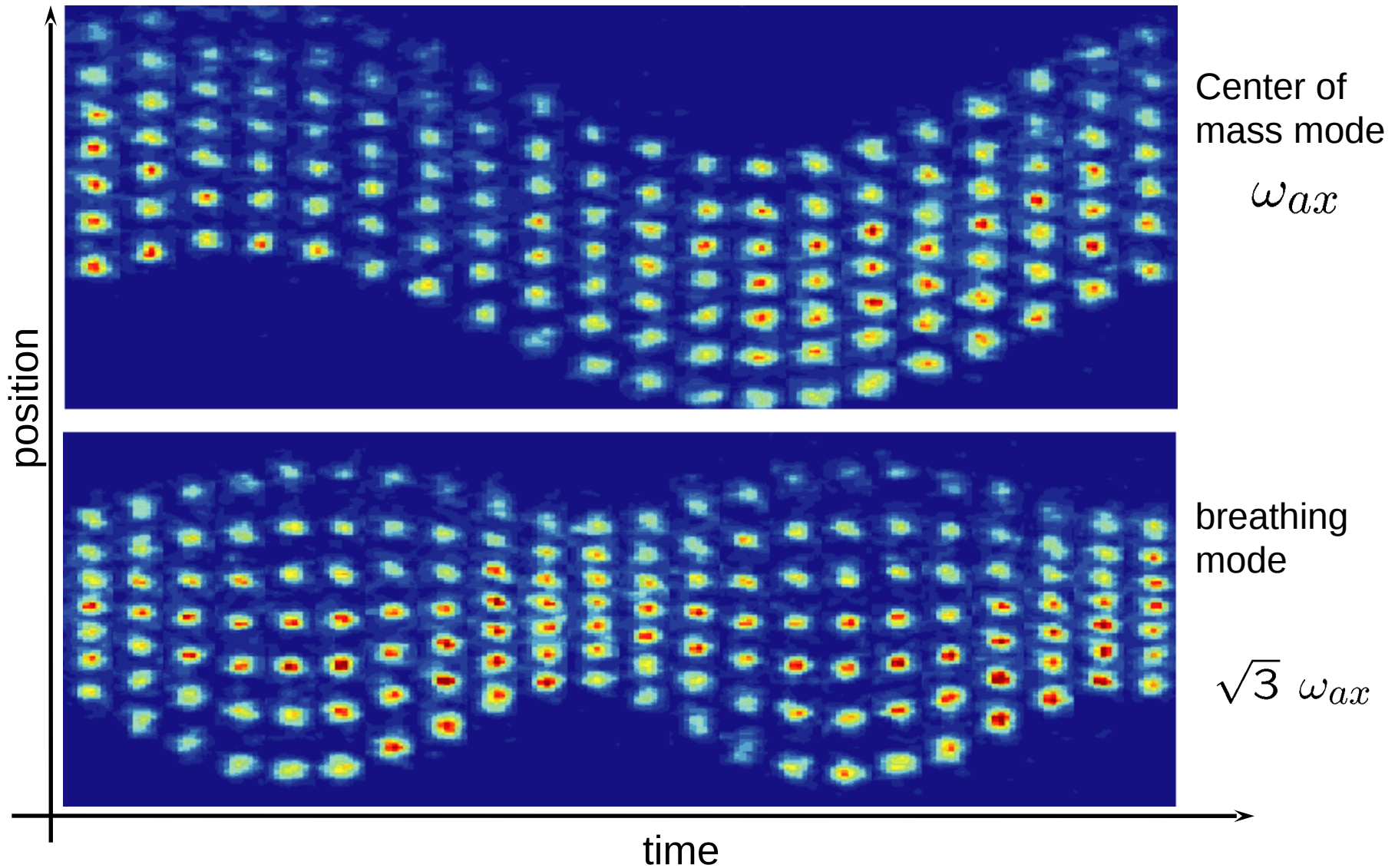
Innsbruck, Austria: $^{40}\text{Ca}^+$

Boulder, USA: Hg^+



Aarhus, Denmark: $^{40}\text{Ca}^+$ (red) and $^{24}\text{Mg}^+$ (blue)

Common mode excitations



Breathing mode excitation

