

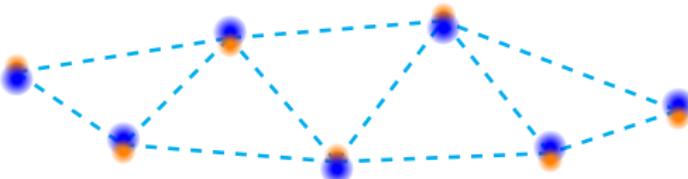
# Manipulating single NaCs in optical tweezers

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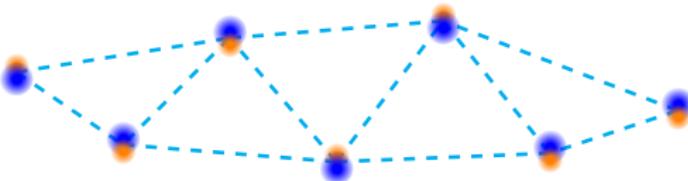


## Optical tweezer

- Single site detection
- Single site control
- Flexible geometry

## NaCs molecule

- Strong dipole interaction  
Dipole moment: 4.6 Debye
- Made from alkali atoms



## Optical tweezer

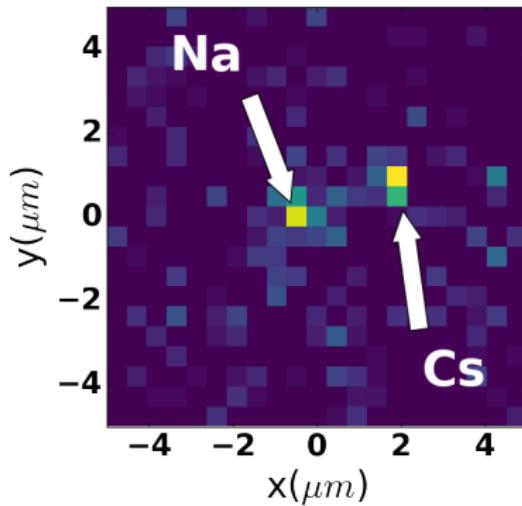
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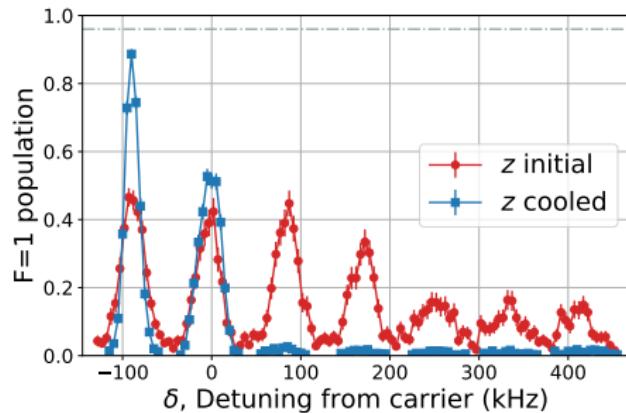


## Loading



Loading probability per site: 60%  
Post select on initial and final state.

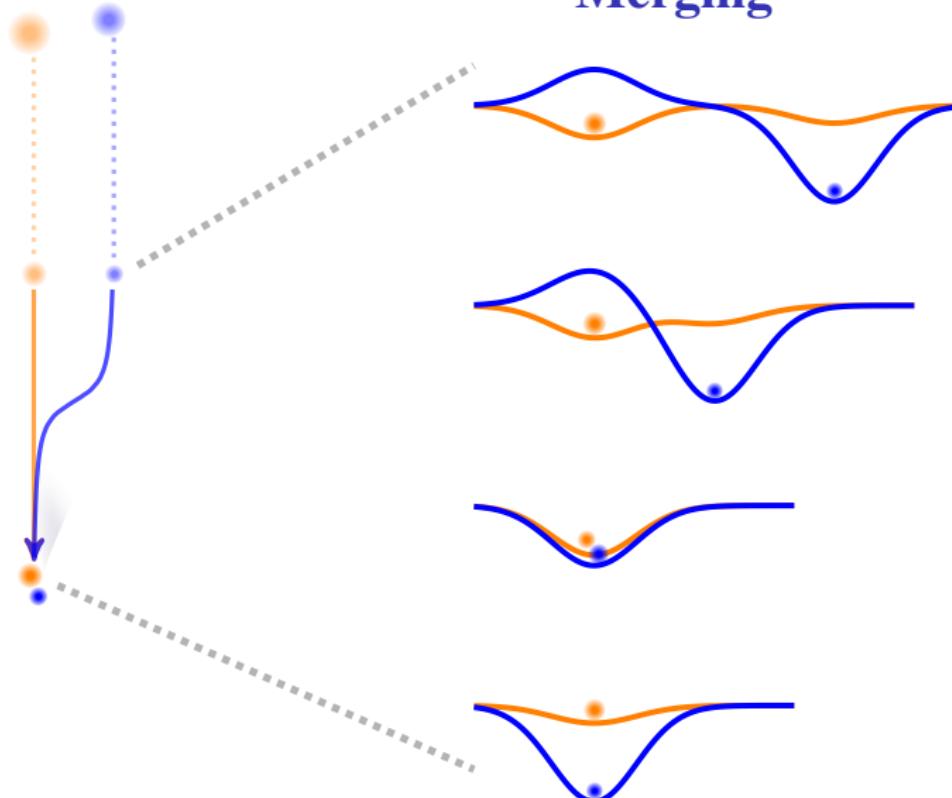
# Cooling



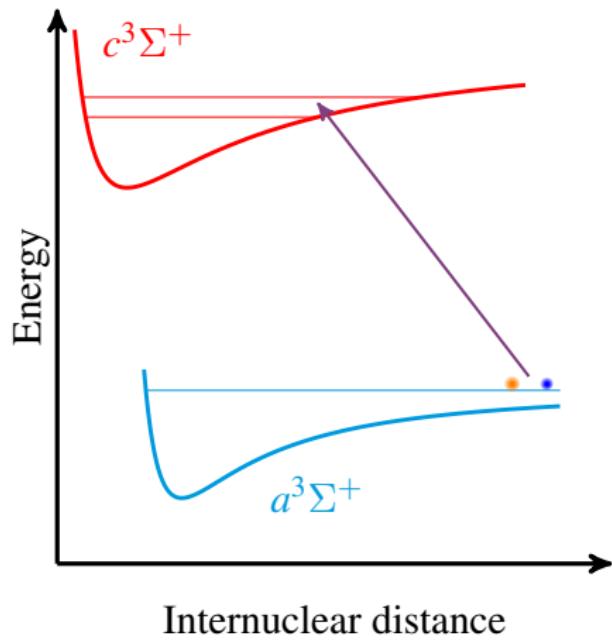
Cs: 96% ground state

Na: 94% ground state

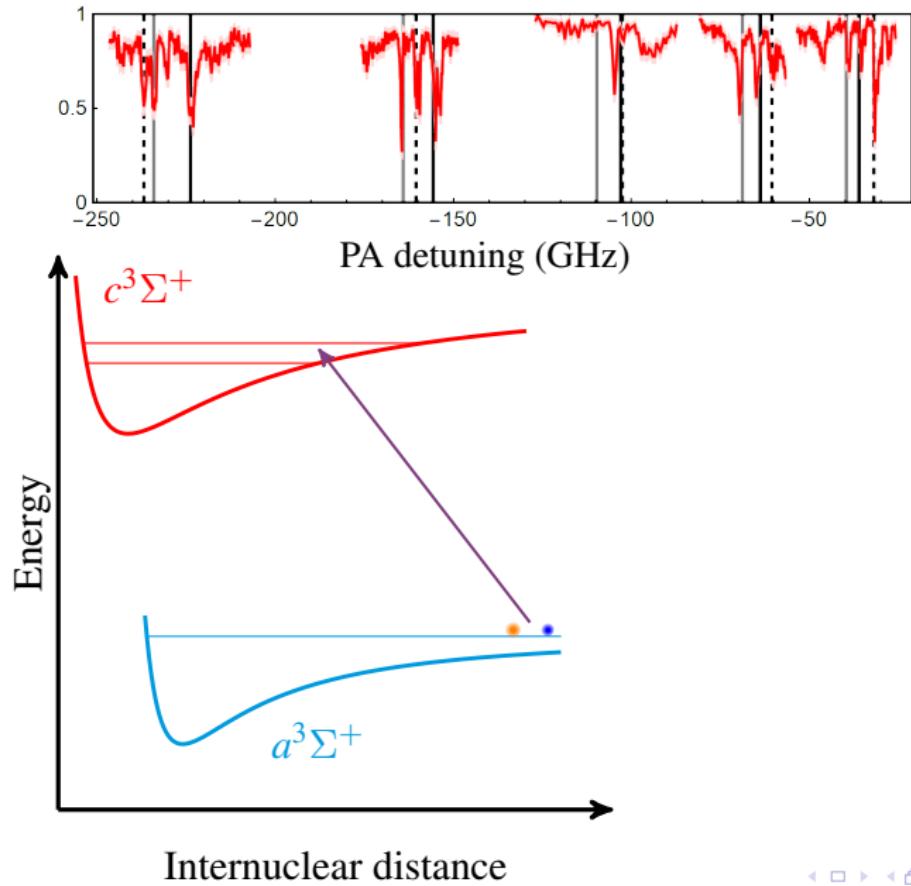
# Merging



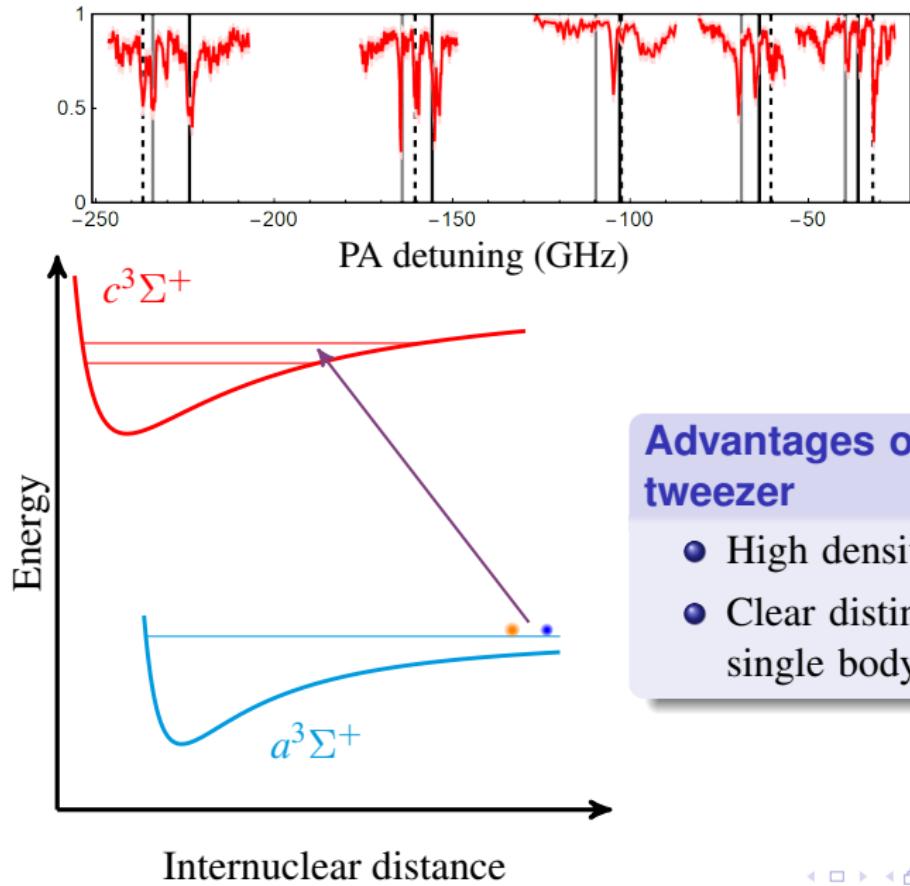
## Photoassociation (PA)



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### Advantages of optical tweezer

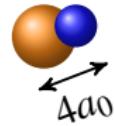
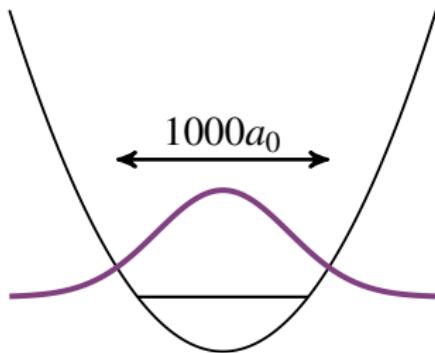
- High density
- Clear distinction from single body loss

## Getting to ground state

- Full control of internal state
- Stronger interaction

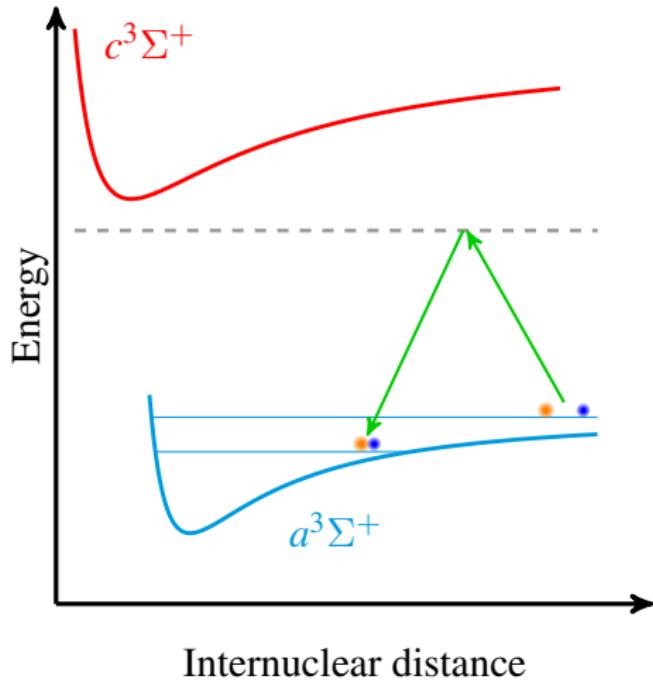
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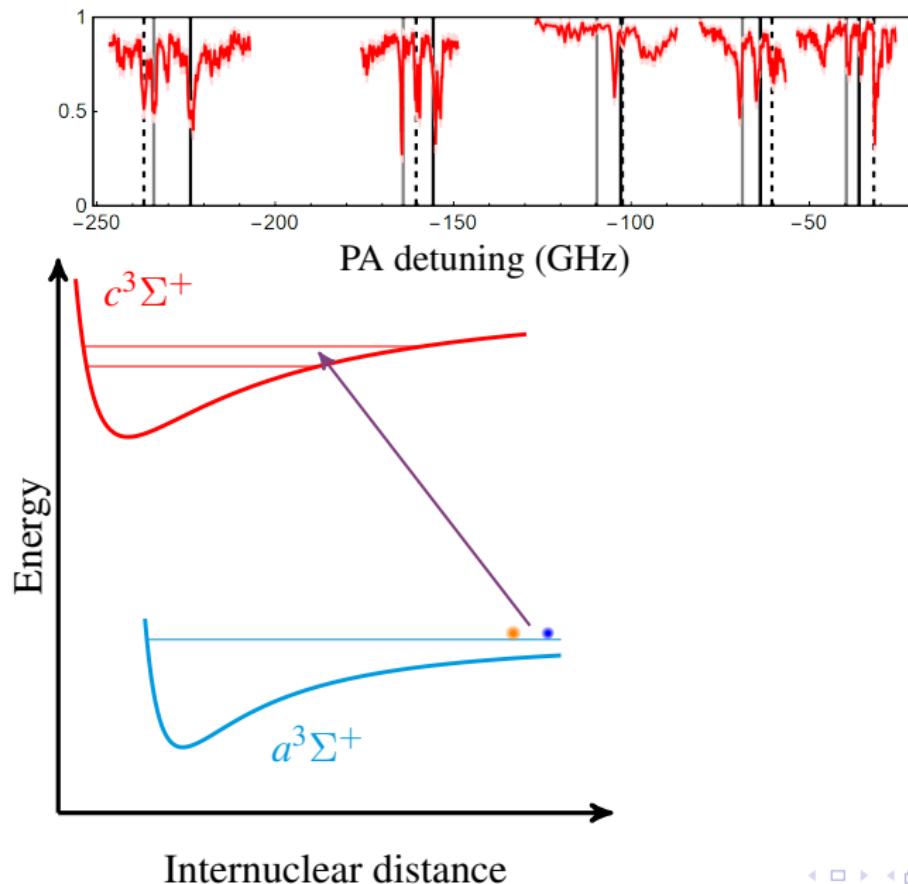


## Getting to ground state

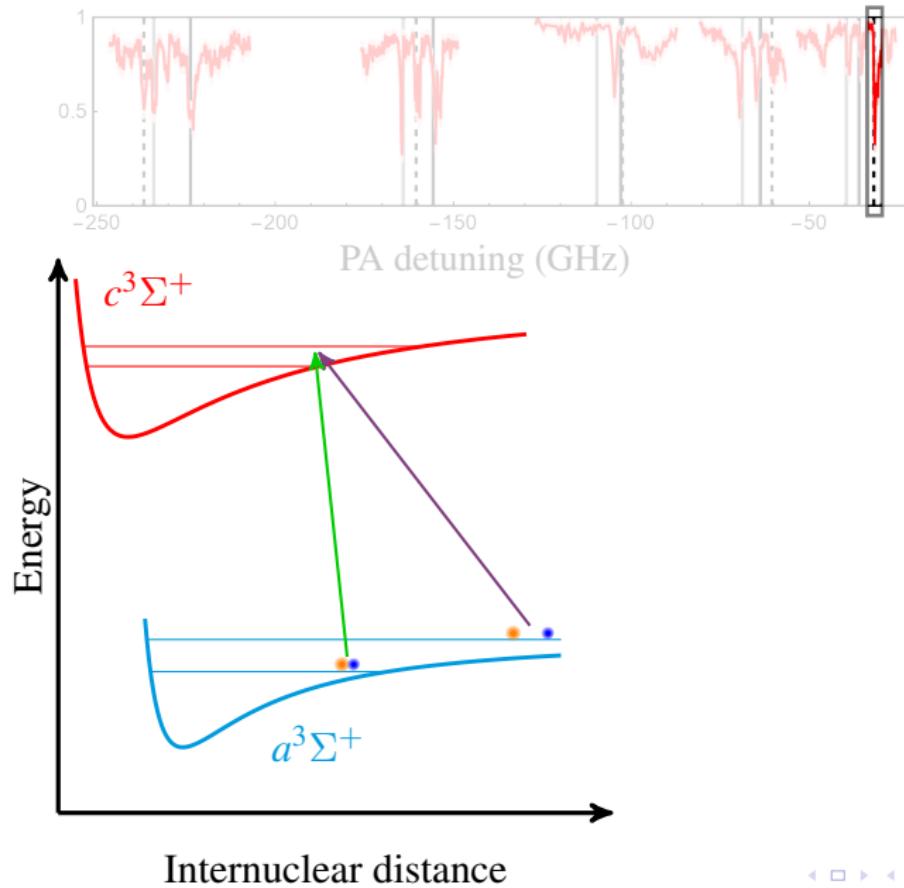
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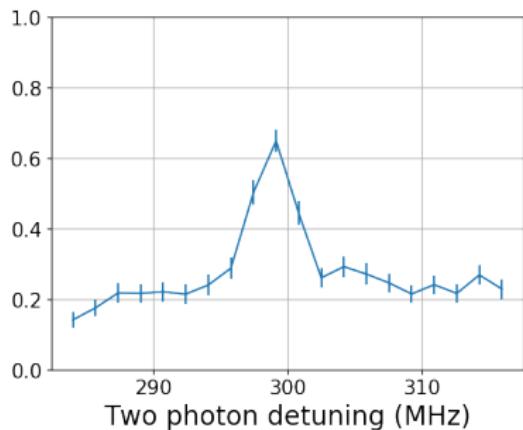
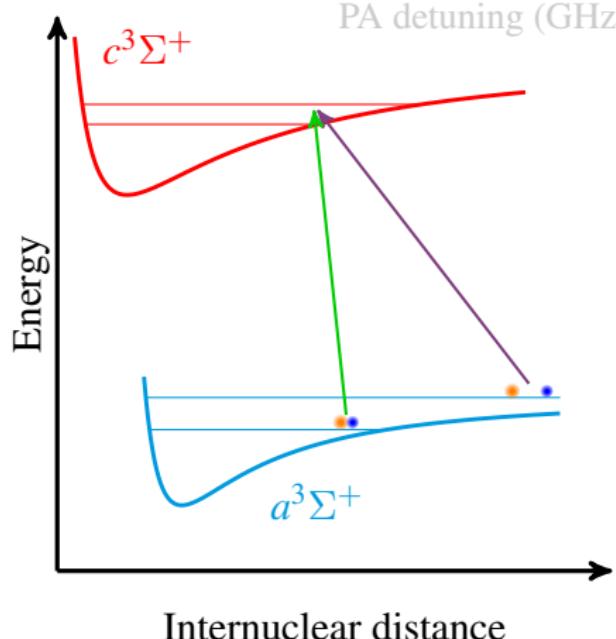
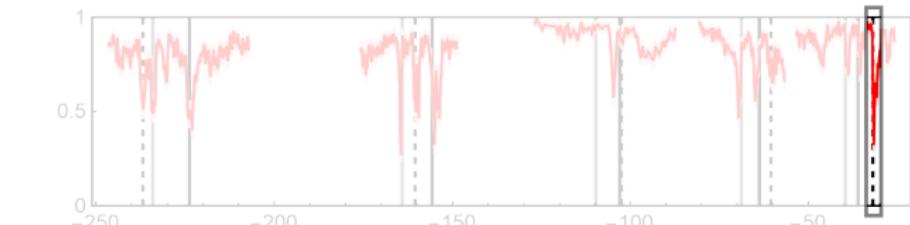
## Photoassociation (PA)



# Electromagnetically Induced Transparency (EIT) spectroscopy



# Electromagnetically Induced Transparency (EIT) spectroscopy



## Next step

Make ground state molecules!!

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Thank you for your attention.

