

Building Single Molecules from Single Atoms

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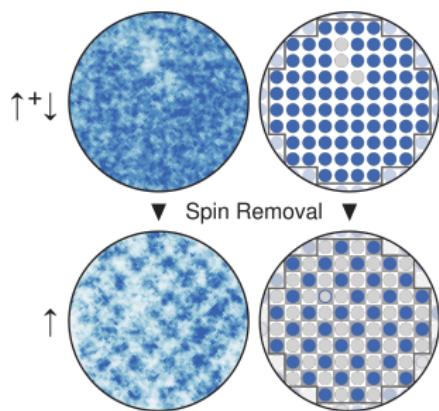
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Atom

- Laser cooling/trapping
- Internal state control
- High fidelity imagining
- ...

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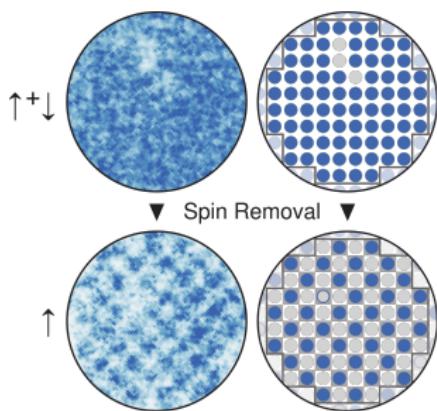
Nature 545, 462-466 (2017)

Atom

- Laser cooling/trapping
- Internal state control
- High fidelity imagining
- ...

Molecule

- Strong interaction
- Rich internal structure



Nature 545, 462-466 (2017)

Direct molecule cooling

Path to Ultracold Molecules

Direct molecule cooling

Making molecule from atoms

Path to Ultracold Molecules

Assemble molecule in tweezers

Making molecule from atoms

Outline

1 System Overview

2 Trapping and Cooling of Atoms

3 Atom-Atom Interaction and Molecule Formation

Steps



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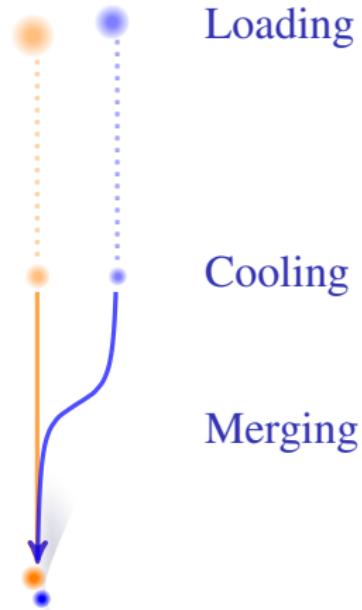
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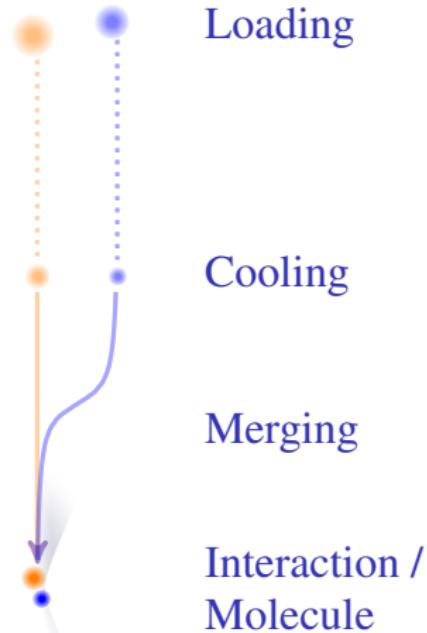
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Cooling

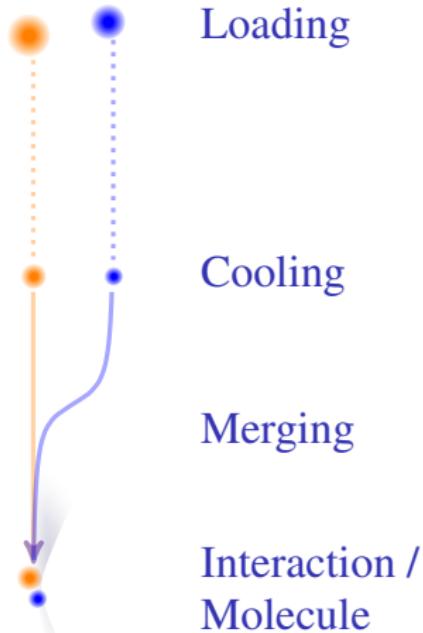
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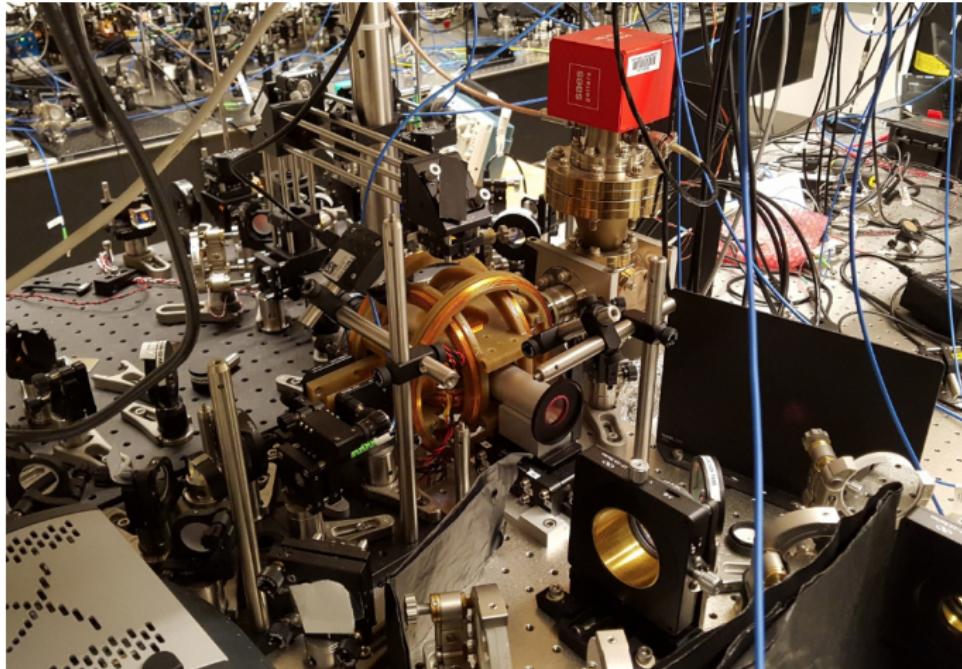
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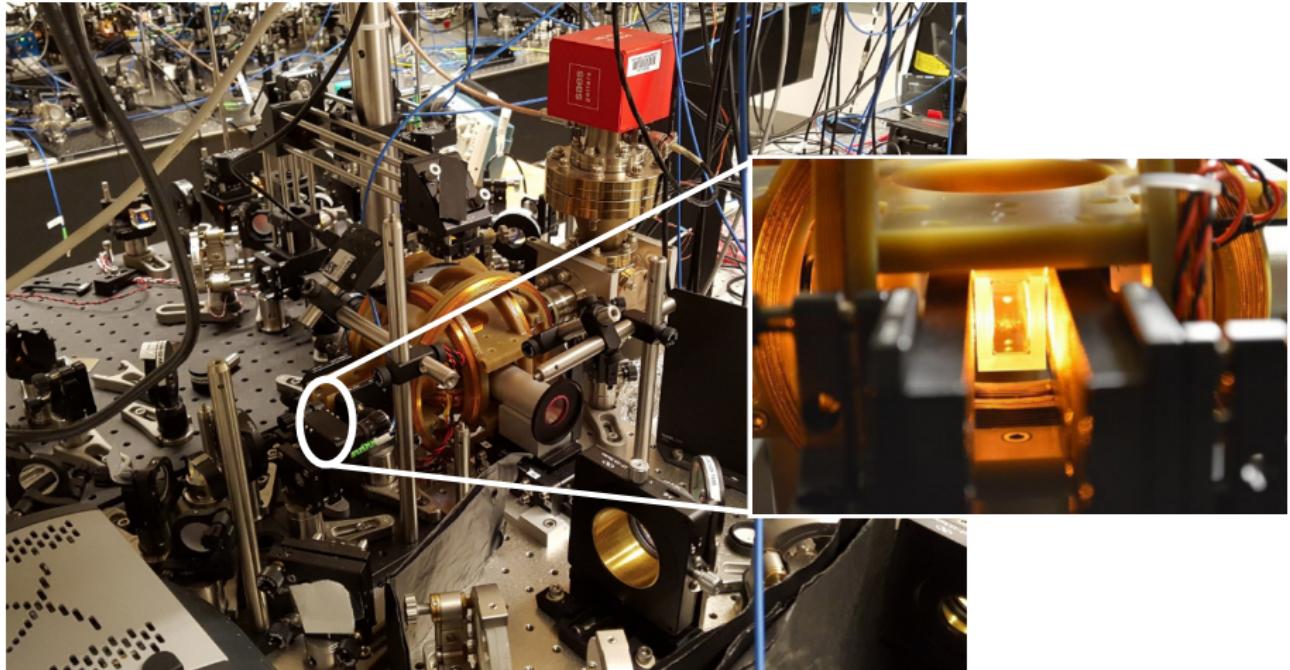


Steps



Science 360 6391, 2018





Single Atom in Tweezer

Raman Sideband Cooling

Outline

1 System Overview

2 Trapping and Cooling of Atoms

3 Atom-Atom Interaction and Molecule Formation

Optical Transfer to Molecular State

Photoassociation (PA) Spectroscopy

Interaction Shift

All-Optical Transfer to Weakly-Bound Molecular

