Magneto-optical trapping and sub-Doppler cooling of molecules.

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Atomic physics has been revolutionised by the introduction of laser techniques to cool atoms far below the Doppler limit. Now, it has become possible to laser cool molecules, to collect them in a magneto-optical trap, to cool them below the Doppler limit [1] and to trap them with modest magnetic fields. These ultracold molecules open up a wide vista of future applications. To give a few examples, they can be optically or magnetically trapped to form arrays for quantum simulation, they can make a molecular fountain for testing fundamental physics at unprecedented levels of sensitivity, and they open a new energy range for the study of ultracold collisions and ultracold chemistry. I will review the current status of this field.

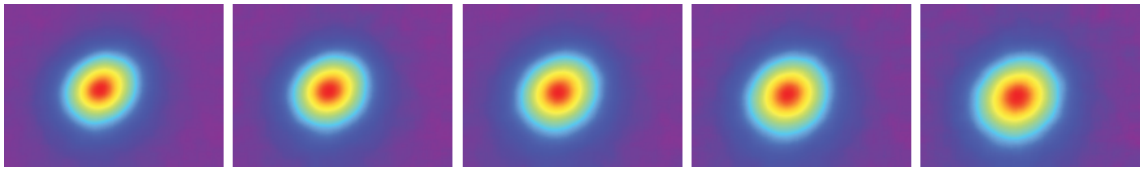

Fig. 1: Images of a CaF cloud expanding freely after cooling to 52(2) μK [1].

References

[1] S. Truppe *et al.*, arXiv:1703.00580v1

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