Making and exploring Bose-Einstein condensates of dipolar molecules

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We have recently created the first Bose-Einstein condensates of dipolar molecules [1]. Building on our demonstration of microwave shielding of NaCs molecules [2], we now efficiently cool gases of NaCs from 700 nK to less than 10 nK, deep into the quantum degenerate regime. The lifetime of the molecular BEC is almost 2 seconds, reaching a level of stability similar to ultracold atomic gases. This becomes possible with a new collisional shielding method that dramatically suppresses inelastic losses by four orders of magnitude compared to unshielded molecules.

In this talk, I will discuss our experimental approach [3] [4] and share our latest insights. BECs of NaCs offer exciting prospects for the exploration of dipolar quantum matter in regimes that have been inaccessible so far.

References

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