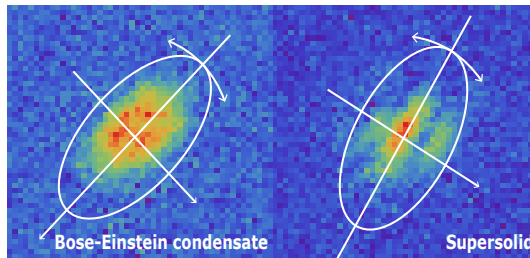


# Rotation of a dipolar supersolid

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Supersolids are a fundamental state of matter in which the same atoms that form a crystalline lattice are also responsible for the coherent flow of mass, typical of superfluids. In 2018, my group realized for the first time a supersolid phase in a quantum gas of strongly dipolar atoms. During the talk, I will focus on our latest work, in which we measure the moment of inertia of the dipolar supersolid [1]. We find that the moment of inertia of the supersolid is lower than the classical value, although the crystalline structure increases the moment of inertia compared to that of a standard superfluid. Our measurement directly demonstrates the superfluid nature of the dipolar supersolid with a rotational experiment and adds the supersolid to the list of superfluid systems with a quenched moment of inertia.



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[1] Tanzi L. et al., Evidence of superfluidity in a dipolar supersolid from non-classical rotational inertia, *Science* **371** (2021) 6534.

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