# Cooling close to absolute zero temperature: A recipe for discoveries

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Why do physicists freeze matter to extremely low temperatures? Why is it worthwhile to cool to temperatures which are a billion times lower than that of interstellar space? In this talk, I will experimentally demonstrate phenomena at low temperature and discuss new forms of matter. Of special interest are superfluids which can flow without dissipation, and quantum phase transitions which occur even at zero temperature. I will illustrate persistent flows using superconductors. Recently, we have observed a supersolid which is gaseous, liquid and solid at the same time.