

New opportunities in quantum simulation with ultrapolar molecules

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I will present new efforts at UChicago toward building novel quantum phases of matter using the emerging technology of “ultrapolar” molecules cooled to nanokelvin temperatures. Specifically, we hope to realize exotic topological superfluids built from interacting gases of KAg molecules, which could feature extraordinary characteristics such as resistance to disorder, frictionless flow, and the emergence of Majorana particles. Another complementary goal is to control chemical reactions built from the bottom up by tailoring light-matter interactions of individual particles coupled to an optical cavity.

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