

Building quantum systems from scratch

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Cooling and manipulating atomic gases have opened up new avenues to explore fundamental concepts in quantum many-body physics. Synthetically created potentials and control of atom-atom interactions have made it possible to tailor the properties of experimental systems at a microscopic level. This led to the concept of quantum simulation – here a system capable of reproducing the physics of many-body Hamiltonians. One of the goals of this approach is to provide answers to open questions in the context of condensed matter physics. An equally important frontier is the construction of novel systems, which may at present not be realisable in solid-state or other systems. This path leads to new questions and surprises.

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