

New Windows on Fundamental Physics: from tabletop devices to large scale detectors



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Configurable optical lattices: Quantum simulation and sensing for fundamental physics

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Arrays of atoms in optical lattices offer a powerful platform to perform experimental simulation of complex quantum systems. The range of accessible physics can be extended further by augmenting the system with individually-controllable optical tweezers. I will describe a new experimental platform based on ultracold strontium in a hybrid optical lattice/tweezer potential, and will outline some key physics goals including simulation of curved spacetime. I will also discuss the promising role of potential feedback pathways between new ultracold quantum sensors and studies of many-body physics.

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