Microscopically-Controlled Arrays of Alkaline-Earth Atoms

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I will describe recent work in which we use microscopically-controlled arrays of alkaline-earth atoms for experiments in quantum information science. While their increased complexity leads to challenges, alkaline-earth atoms offer new scientific opportunities by virtue of their rich internal degrees of freedom. I will report on how these degrees-of-freedom can cooperate with optical-tweezer-based single-particle control to impact areas ranging from quantum information processing, to quantum metrology, and quantum simulation.