Control of correlated electrons in metal-oxide superlattices

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This talk will begin with a brief overview of recent experimental results on spin-fluctuation-mediated Cooper pairing [1,2,3] and competing order [4,5] in high-temperature superconducting cuprates. Guided by these and other results, we are pursuing a research program on artificially designed metal-oxide superlattices. We outline recent progress of this program, including the control of the electronic dimensionality [6], electron-phonon interactions [7], and spin, charge, and orbital order [8,9] in cuprate- and nickelate-based superlattices, with a focus on the essential contributions of resonant elastic and inelastic x-ray scattering to this rapidly evolving field of research.

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