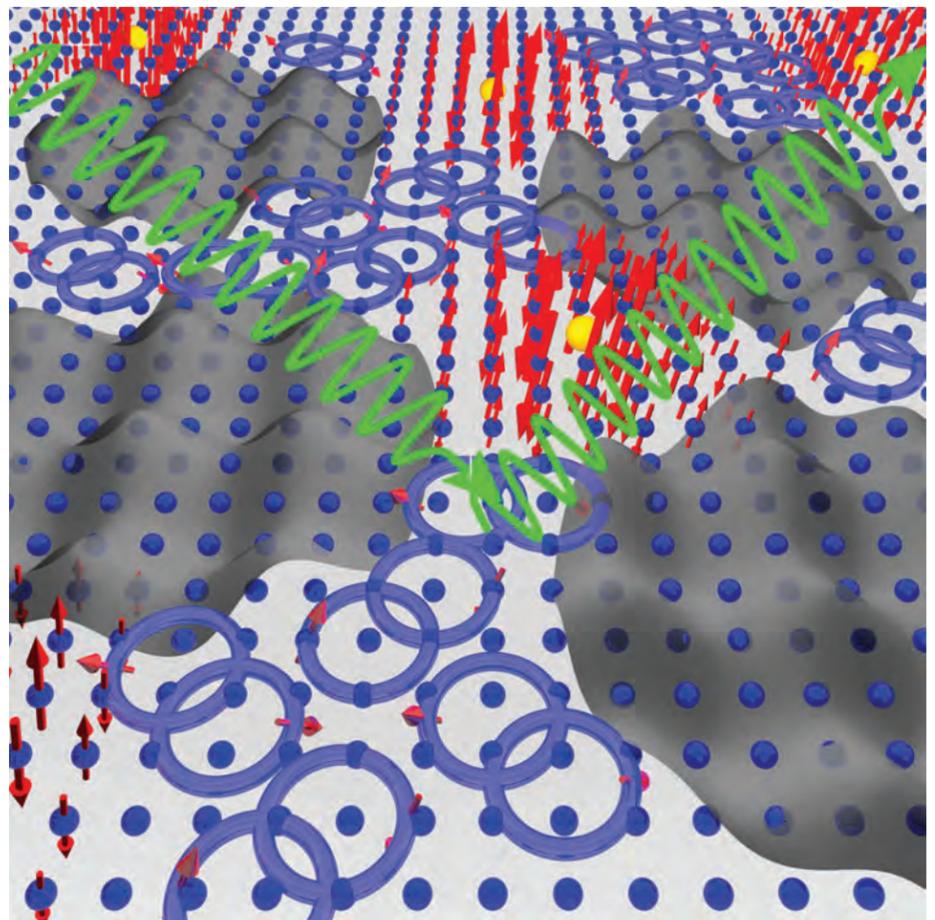


Alex Frañó

What Can Synchrotron X Rays Tell Us about High-Tc Superconductors, Designing Interfacial Magnetism, and Kitaev-Frustrated Magnetism?

We are living in exciting times for synchrotron science. X-ray experiments are now deemed a powerful tool to address various condensed-matter problems. Quintessential cases are transition-metal oxides, where electronic correlations yield intertwined, ordered patterns of the spin, charge and orbital character of the d-wavefunctions. Inelastic, resonant, and other modern x-ray scattering methods are key to investigate the interplay of such “quantum periodicities”. Recently, a combination of x-ray scattering techniques elucidated the universality, tunability, and possibly a lattice-dynamical precursor of charge order in superconducting cuprates. Furthermore, exploiting the high cross-section and element specificity of resonant scattering, magnetism solely at interfaces between oxide layers can now be detected. In addition, applied magnetic fields can expose momentum-resolved coexistence of various magnetic phases in frustrated Kitaev systems. Far-reaching changes are occurring in synchrotron facilities, and diffraction-limited sources will be crucial to this field throughout the next decades.



Alex Frañó is Assistant Professor at the University of California, San Diego. He obtained his Bachelor's degree in Physics from the National University of Honduras in Tegucigalpa. Then, after playing in an alternative rock band in Mexico City and Los Angeles, he returned to Physics to work on his Master's degree at the University of Stuttgart. He did his PhD research with Prof. Bernhard Keimer at the Max Planck Institute for Solid State Research stationed at the synchrotron facility in Berlin. He won the Ernst-Eckhard-Koch Prize and the Springer Outstanding PhD Research Prize. He was later awarded the University of California (UC) Presidential Postdoctoral Fellowship to work at UC Berkeley with emeritus Chancellor Robert Birgeneau. His research interests include strongly correlated electron systems, design and growth of transition-metal oxide heterostructures, and various forms of x-ray scattering tools to probe their properties.

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