

The Chemistry of Quantum Materials

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Quantum materials are hoped to change technology in various aspects. However, most of the desired applications are hindered by the lack of suitable materials. In my group we are using concepts from chemistry to understand, predict and synthesize new quantum materials. In this talk, I will show how simple concepts, such as measuring bond distances, allow us to make predictions about electronic structures of materials, which we can then use to find new topological materials. We then can combine this with structural building blocks containing magnetic elements to design materials with non-collinear or even non-coplanar magnetism. Thinking about the degree of delocalization in a chemical bond can be helpful to find kagome or linear-chain materials with band structures that better resemble simple tight binding models. I will give a general overview how powerful chemical concepts are in materials discovery and highlight a few materials that were discovered in this light.