Post-Pandemic Tool for Quantum Materials and vice-versa

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Raman scattering, invented at the end of the last pandemic, can provide a wealth of information on the fractional, magnetic, lattice and charge quasi-particles at the heart of quantum materials and devices. After a brief overview of the technique and its power, I will focus on our recent discovery of the Axial Higgs Mode via Quantum interference. Here a new quasi-particle emerges from the combination of quantum geometry and strong correlations. This demonstrates the power of Raman to reveal the vector properties of a low energy mode, heralds the discovery of the first unconventional charge density wave and multi-component symmetry breaking transition. Time permitting I will discuss our efforts to use quantum materials in biosensing to help prevent the next pandemic.