Contribution ID: **36** Type: **Invited Oral**

Three different charge orders in kagome lattice materials

Tuesday, December 3, 2024 9:15 AM (30 minutes)

Kagome lattice is one of the most fertile geometric motifs in condensed matter physics, where a unique interplay between topology, correlation, and frustration gives rise to a plethora of quantum phenomena. Charge ordering is an example of quantum states prevalently observed in various Kagome lattice materials, including AV3Sb5, ScV6Sn6, and FeGe, and is found to be intertwined with superconductivity, magnetism, and anomalous Hall effect in a nontrivial manner.
In this talk, I will present our comprehensive investigations of charge orders in Kagome lattice materials using a suite of scattering and spectroscopy techniques, including ARPES and time-resolved XRD. Our results point toward that despite their apparently similar phenomenology, the charge orders in AV3Sb5, ScV6Sn6, and FeGe each have a completely different nature, emerging from electronic instability, lattice instability, and magnetism-driven transition, respectively. Our investigations not only provide guidance on the classification of charge order in broader quantum materials, but also highlight the utility of combining complementary photon science techniques –photon-in-electron-out, photon-in-photon-out, static and time-resolved –for a deeper understanding of quantum phenomena in solids.

Primary author: Dr KANG, Min Gu (Cornell University)

Presenter: Dr KANG, Min Gu (Cornell University)

Session Classification: Session 4