Contribution ID: **14** Type: **Invited Oral**

The rich physics of bilayer kagome metals

Long-range electronic order descending from a metallic parent state constitutes a rich playground to study the intricate interplay of structural and electronic degrees of freedom. Kagome materials appeared as the perfect stage for such explorations. Specifically, RV6Sn6 (R = rare earth atom) bilayer kagome metals are topological systems with Dirac-like itinerant states, van Hove singularities and correlated flat bands [1,2]. Interestingly, within this family, ScV6Sn6 also features a charge density wave (CDW) phase that affects the susceptibility, the neutron scattering, and the specific heat, and whose motif differs significantly from that of the siblings AV3Sb5 (A = K, Rb, Cs) and FeGe. As such, in this presentation, I will give an overview about the rich physics recently unveiled in bilayer kagome metals, and will also discuss about the dynamics of that CDW phase [3]. Specifically, while there is no consensus yet on its microscopic origin, with contradicting affirmations supporting both electron- electron and electron-phonon interaction, we reveal a prominent role played by the structural degrees of freedom in the stabilization of the charge order.

References:
[1] D. Di Sante et al, Nature Physics 19, 1135 (2023).
[2] H. Li et al, Nature Physics 20, 1103 (2024)
[3] M. Tuniz et al, Communications Materials 4, 103 (2023).

Primary author: DI SANTE, Domenico (University of Bologna)

Presenter: DI SANTE, Domenico (University of Bologna)