

Revealing the imperfection of perfection: The importance of frankness in a meaningful collaboration

Refining the synthesis of nickelate superconductors is a great example of the importance of frankness in a meaningful collaboration. Harold Hwang (Stanford) discovered this exciting family of new superconductors and his fruitful collaboration with Lena Kourkoutis (PARADIM) helped to perfect them. Their latest innovation involves the preparation of free-standing membranes of superconducting nickelates, where they have been released from the underlying substrate. As superconductivity in nickelates at ambient pressure has only been observed in thin films, many questions exist regarding the role of the substrate, including the strain imparted by it. Being able to measure superconductivity in the same film before and after removal from the substrate helps to clarify the role of the substrate.

The role of electron microscopy in revealing the microstructure and defects in these nickelates led to this recent paper being dedicated to Lena Kourkoutis' memory. Lena recognized that many synthesis groups wishing to collaborate with microscopists simply desire a “pretty picture” of structural perfection to complete their synthesis paper. Lena's standard response was “I don't do that; I do science.” Her hallmark of exposing and discussing defects is evident in all of her papers and underscores the value of a good collaborator being simultaneously a proponent and a critic. Harold Hwang recognized this and says that Lena's rigor is precisely what drew him to work with her repeatedly for over 20 years.

Y. Lee, *et al.* [available online Nat. Synth. \(2025\)](#).

Harold Hwang (Stanford), David Muller, and Lena Kourkoutis (PARADIM)

