Abstract
The Lu group investigates metal-metal bonds of first-row transition metals. Bonds between first-row metals are typically weaker than their heavier congeners, which presents a synthetic challenge to isolate and study them. We are broadly interested in developing these hybrid species for catalysis, where using non-precious metals is sensible from economical and sustainability standpoints.

Transition metal pairs can exhibit multi-electron redox capability, which is promising for reducing small-molecules. The synergistic combination of different metals could generate hybrid “metals” with original properties and/or unique reactivities. We have investigated diverse metal-metal pairings to understand: how one transition metal influences another, and how to tune chemical properties by simply varying the metals. We are currently exploring this approach to develop bimetallic catalysts for nitrogen and hydrogen activation.