

Abstract Submitted
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Searching for New Intermetallic Superconductors from the Viewpoint of Chemistry¹ WEIWEI XIE, Louisiana State Univ - Baton Rouge, ROBERT CAVA, Princeton University, ROBERT J. CAVA COLLABORATION — The conventional pictures of superconductivity arising from the Bardeen-Cooper-Schrieffer (BCS) theory focus on the electron-phonon coupling that induces a superconducting state. Until now, BCS theory is still in a predominant position and is applied to determine whether a superconductor could be classified as BCS-like or not. Recently, with more high-temperature superconductors being discovered, more ‘universal’ mechanisms were sought for to explain both conventional and unconventional superconductors. However, neither BCS nor other modified mechanisms are able to connect physical properties with chemical structures. Thus, the primary questions are whether the general statements of BCS theory can be associated with distinct chemical meanings, such as crystal structural features and specific chemical bonding, and whether & how the physical phenomenon of superconductivity can be interpreted from the standpoint of chemistry. Moreover, the approach based on the chemistry interpretation has to be taken to explore the new superconductors. In this talk I will describe some empirical design rules and examples that have yielded new intermetallic superconductors.

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