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How Does Nature Choose? A Combinatorial Approach to Preferred Chemical Ordering in Perovskite Structures. MATTHEW LORDS, ERIN GILMARTIN, GUS HART, BYU — Material properties are intimately tied to crystal structure. Many materials, alloys in particular, share a common, underlying "motif", such as fcc/bcc/hcp "parent lattice", but have different chemical orderings. Among the nearly infinite possibilities for chemical orderings, why does nature choose the few it does? We answer this question generally and give an example of the perovskite structure, important in ferroelectrics, catalysts, and superconductors.

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