Abstract Submitted
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Algebraic search for cooperative tilt patterns in networks of interconnected polyhedra TYLER AVERETT, BRANTON CAMPBELL, Brigham Young University Provo, THOMAS WHITTLE, SIEGBERT SCHMID, University of Sydney, CHRISTOPHER HOWARD, University of Newcastle — Crystalline solids consisting of networks of interconnected rigid molecules are ubiquitous amongst functional materials, having a wide range of applications. In many cases, the important properties of these materials are sensitive to the tilting of individual rigid units. However, the shared atoms that connect the rigid units together impose severe constraints, so that any tilting must be cooperative throughout the entire network. A variety of methods have been developed for determining which tilt patterns are allowed and which are not for a given material, each having a limited scope. We will present a purely algebraic approach, based on group representation theory, which exhaustively classifies the allowed tilt modes for any network of rigid units.

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