

Abstract Submitted  
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**Geometric Magnetic Frustration in rock-salt ordered  $A_5BO_6$  materials**<sup>1</sup> JEREMY P. CARLO, Villanova University, SHAHAB DERAKHSHAN, California State University, Long Beach — When the structural arrangement of ion in a material inhibits the development of magnetic order, geometric frustration occurs. Most often this occurs with antiferromagnetically correlated moments with triangular and tetrahedral configurations, and diverse ground states may arise depending on the balance between competing interactions. Hence there is great interest in finding new frustrated systems, to go beyond the well-studied pyrochlore, spinel, and Kagome lattice frustrated systems. Here we present materials based on the  $A_5BO_6$  structure, which exhibit “rock-salt” order of magnetic B cations (Ru, Re or Os). Specimens with  $d^1$ ,  $d^2$ , or  $d^3$  configurations may be produced depending on A-site doping. These systems crystallize into either orthorhombic  $Fddd$  or monoclinic  $C2/m$  settings, each of which exhibits a distinct local magnetic environment, with diverse properties reported in various materials. Most recently, we have synthesized  $Li_4MgOsO_6$  and  $Li_4MgReO_6$ , which may crystallize into either crystal system, making them “Rosetta stones” of sorts in elucidating the nature of frustration in these systems. We report here the results of magnetic and structural characterization of these materials.

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Jeremy P. Carlo  
Villanova University

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