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Frustrated quantum magnetism in the 6H-perovskites

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I will review the recent state of research on the 6H-perovskites, $Ba_3MA_2O_9$, a large class of materials that can accommodate many different magnetic ions on ostensibly triangular lattices. This class of materials has given rise to several important discoveries in recent years, including quantum spin liquids, a quantum spin-orbital liquid and the first perfectly triangular spin-1/2 antiferromagnet. Many of these materials also provide an interesting interplay of magnetic, orbital and charge degrees of freedom. Others suffer from high levels of site disorder, which leads to interesting physics, at least in the case of the spin-orbital liquid candidate $Ba_3CuSb_2O_9$. I will primarily discuss our recent work on the materials $Ba_3MSb_2O_9$, where M = Cu, Ni and Co using the techniques of nuclear magnetic resonance (NMR), muon spin rotation (μSR) and ultrasound velocity measurements.