Invariant theory, without groups

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In this talk I will define, contextualize and discuss the concept of manifold submetry, which generalizes classical concepts in Riemannian geometry like Riemannian submersions and isometric group actions. The particular case of manifold submetries from spheres (spherical manifold submetries) is central to understanding the infinitesimal structure of general manifold submetries.

The goal of this talk is to give a panoramic view of recent results which establish an equivalence between spherical manifold submetries and special polynomial algebras called "Laplacian algebras". This equivalence generalizes Classical Invariant Theory, but has nicer properties that can be exploited to actually obtain new results in Classical Invariant Theory itself.