The Fuzzy S^7 and Beyond

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We define the symmetry of a space as invariance under a Lie–Poisson algebra action, and consider algebraic varieties defined by invariant polynomials. As a quantization of such spaces, matrix regularization associates the polynomial algebra with an algebra generated by representations of a Lie algebra, and has seen significant progress in recent years. In particular, it has been shown that matrix regularizations of a wide variety of spaces can be constructed using reducible representations. In this talk, we present the construction of fuzzy S^7 as a prototypical example, and discuss a general framework extending this construction.