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Quantum deformations of projective three-space

The classification of noncommutative versions of projective three-space (in the form of four-dimensional Artin–Schelter regular algebras) is an important open problem in noncommutative projective geometry. I will discuss some recent progress on this question, in the form of an explicit description of the possible Calabi–Yau deformations of the polynomial ring. The approach uses results of Dolgushev and Kontsevich on deformation quantization, together with some Poisson geometry, to reduce the problem to Cerveau and Lins Neto's classification of degree-two foliations of projective space.