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Period domains for quantum planes

A celebrated theorem of Artin, Tate and Van den Bergh explains that noncommutative analogues of the projective plane (in the form of 3d Artin-Schelter regular algebras) are classified up to isomorphism by automorphisms of cubic curves. I will outline an alternative viewpoint on this classifying data, based on Katzarkov-Kontsevich-Pantev's theory of noncommutative Hodge structures: it is the shadow of a canonical mixed Hodge structure on the topological K-theory of an associated differential graded category. As an application, we realize a proposal of Kontsevich, giving the first calculation of his deformation quantization formula in the case of rational Poisson surfaces, recovering Feigin and Odesskii's explicit presentations of noncommutative algebras in terms of elliptic theta functions. This talk is based on joint work with Theo Raedschedlers and Sue Sierra.