

This is joint work with Farzad Fathizadeh. In this work we study the curved geometry of noncommutative 4-tori. We use a Weyl conformal factor to perturb the standard volume form and obtain the Laplacian that encodes the local geometric information. We use Connes' pseudodifferential calculus to explicitly compute the terms in the small time heat kernel expansion of the perturbed Laplacian which correspond to the volume and scalar curvature of the curved NC 4-torus. We establish the analogue of Weyl's law, define a noncommutative residue, prove the analogue of Connes' trace theorem, and find explicit formulas for the local functions that describe the scalar curvature. We also study the analogue of the Einstein-Hilbert action for these spaces and show that metrics with constant scalar curvature are critical for this action.