1099-58-41 **Michel L Lapidus*** (lapidus@math.ucr.edu), Department of Mathematics, University of California, Riverside, CA 92521-0135, and **Jonathan Sarhad**, Department of Biology, University of California, Riverside, CA 92521. *Dirac Operators on Fractal Manifolds, Noncommutative Geometry and Intrinsic Geodesic Metrics.*

This is joint work with Jonathan Sarhad, which will appear in the "Journal of Noncommutative Geometry". We construct Dirac operators and spectral triples for certain, not necessarily self-similar fractal sets built on countably many curves. Connes' distance formula in noncommutative geometry provides a natural intrinsic metric on the fractal. As an important motivating example, we consider the harmonic Sierpinski gasket, which represents the ordinary (Euclidean) gasket from the analytical point of view. We prove that the noncommutative metric coincides with the natural geodesic metric on the harmonic gasket (recently studied by J. Kigami). The present work extends to the non-Euclidean (and analytically relevant) setting some of the main results of the paper by E. Christensen, C. Ivan and M.L. Lapidus (Adv. in Math. No. 1, 217 (2008, pp.42-78). Our current, broader framework allows for several further potential applications to geometric analysis on fractal manifolds. If time permits, several open problems will be discussed, including the recovery of the intrinsic Hausdorff metric, via a Dixmier trace-type formula. (Received January 12, 2014)