1021-28-88 **Michel L. Lapidus*** (lapidus@math.ucr.edu), University of California, Department of Mathematics, Riverside, CA 92521-0135. *Fractals and Zeta Functions.*

We give an introduction to the theory of complex fractal dimensions, as developed in the author's two books (both joint with Machiel van Frankenhuisjen) "Fractal Geometry and Number Theory" (Birkhauser, Boston, 2000, 280pp.) and, in significantly expanded form, in "Fractal Geometry, Complex Dimensions and Zeta Functions: geometry and spectra of fractal strings" (Springer Monographs in Mathematics, Springer-Verlag, New York, Aug. 2006, 480 pp.). If time permits, we will also brefly dicuss three other situations where fractals and zeta functions interact in a fruitful manner: (1) A higher-dimensional theory of complex fractal dimensions (in joint work with Erin Pearse), with applications to a tube formula in the example of the Koch snowflake curve (J. London Math. Soc., in press) and of a more abstract theory of self-similar systems (memoir, preprint, 2006). (2) Self-similar fractal graphs and Ihara zeta functions (in joint work with Daniele Guido and Tommaso Isola). (3) Dirac operators on fractals built on curves (such as the Sierpinski gasket and certain infinite trees) and their associated spectral zeta functions (in joint work with Cristina Ivan and Erik Christensen). This is aimed in part at developing aspects of 'noncommutative fractal geometry'. (Received August 27, 2006)