

1018-28-104

Michel L. Lapidus* (lapidus@math.ucr.edu), University of California, Department of Mathematics, 231 Surge Building, Riverside, CA 92521-0135. *Complex Fractal Dimensions and Zeta Functions: Shape and Sound of Fractal Strings*.

In this talk, we will give an introduction to the theory of fractal strings and their complex dimensions, as developed by the author and his collaborators (beginning with Carl Pomerance) over the last few years. In particular, we will concentrate on joint results with Machiel van Frankenhuysen on the theory of complex fractal dimensions, as developed in the recent and, respectively, forthcoming, research monographs "Fractal Geometry and Number Theory: Complex dimensions of fractal strings and zeros of zeta functions" (Birkhauser, Boston, 2000, 280pp.) and "Fractal Geometry, Complex Dimensions and Zeta Functions: Geometry and spectra of fractal strings" (Springer Math. Monographs, Springer-Verlag, Aug. 2006, in press, 480pp.), as well as in a series of papers. For pedagogical reasons, the emphasis will be placed on the case of self-similar strings. If time permits, we will also briefly mention several recent developments in various directions, some of which will be discussed by other participants in this special session: Higher-dimensional case (jointly with Erin Pearse, J. London Math. Soc, in press, and papers in prep.); multifractal zeta functions (with Jacques Levy-Vehel and John Rock); random fractal strings (with Ben Hambly (Trans. AMS, No.1, 358, 2006, pp. 285-314). (Received March 01, 2006)