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Multifractals, Zeta Functions, and Spectra of Complex Dimensions. Preliminary report.

The study of ordinary fractal strings via geometric zeta functions and complex dimensions has been generalized and expanded into the realm of multifractal analysis. With regularity (course Hölder exponent) of Borel sets, the multiscale behavior of multinomial and various multifractal measures can be analyzed through use the of multifractal and partition zeta functions. Results of such analysis include determining both the Hausdorff and the Minkowski dimensions associated with certain fractal strings as well as the multifractal spectra of certain multinomial measures. In this talk, we discuss several examples involving these zeta functions, compare them to one another, and shine a light on current related projects. (Received September 13, 2009)