1018-00-76 **John A. Rock*** (rock@math.ucr.edu), **Michel L. Lapidus** (lapidus@math.ucr.edu) and **Jacques Levy-Vehel** (Jacques.Levy_Vehel@inria.fr). *Multifractal Strings and Zeta Functions.* Preliminary report.

We define a one-parameter family of geometric zeta functions for a Borel measure on the unit interval and a sequence which tends to zero. The construction of this family is based on that of the continuous large deviation spectra in multifractal analysis. For a measure which is singular with respect to the Lebesgue measure and a naturally chosen sequence, a certain value of the parameter yields the fractal string and geometric zeta function of the complement of the support of the measure. This new family of zeta functions yields topological and multifractal information which is absent in the current theory of fractal strings. (Received March 01, 2006)