1095-28-146 **Michel L Lapidus*** (lapidus@math.ucr.edu), University of California, Department of Mathematics, Riverside, CA 92521-0135, **Goran Radunovic** (goran.radunovic@fer.hr), University of Zagreb, Department of Applied Mathematics, Unska 3, 10000 Zagreb, Croatia, and **Darko Zubrinic** (darko.zubrinic@fer.hr), University of Zagreb, Department of Applied Mathematics, Unska 3, 10000 Zagreb, Croatia. *Fractal Zeta Functions and Complex Dimensions: A General Higher-Dimensional Theory.*

We will give some sample results from the new theory developed in the forthcoming joint research monograph (by the three authors of this abstract), entitled "Fractal Zeta Functions: Higher-Dimensional Theory of Complex Dimensions", and explain its connections with the earlier one-dimensional theory of complex dimensions developed, in particular, in the research monograph (by M. L. Lapidus and M. van Frankenhuijsen) entitled "Fractal Geometry, Complex Dimensions and Zeta Functions: Geometry and Spectra of Fractal Strings" (Springer Research Monographs, Springer, New York, 2013; 2nd rev. and enl. edn. of the 2006 edn.). In particular, to an arbitrary compact subset A of the N-dimensional Euclidean space (or, more generally, to any relative fractal drum), we will associate new distance and tube zeta functions, as well as discuss their basic properties, including their holomorphic and meromorphic extensions, and the nature and distribution of their poles (or 'complex dimensions'). We will also show that the abscissa of convergence of each of these fractal zeta functions coincides with the upper box (or Minkowski) dimension of the underlying compact set A, and that the associated residues are intimately related to the (possibly suitably averaged) Minkowski content of A. (Received September 07, 2013)