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**Erin P. J. Pearse\*** ([erin@math.cornell.edu](mailto:erin@math.cornell.edu)), 588 Malott Hall, Cornell University, Ithaca, NY 14850. *Self-similar systems and their complex dimensions.*

An iterated function system  $\Phi$  consisting of contractive similarity mappings has a unique attractor  $F \subseteq \mathbb{R}^d$  which is invariant under the action of the system, as was shown by Hutchinson. We show how the action of the function system naturally produces a tiling  $\mathcal{T}$  of the convex hull of the attractor  $F$ . These tiles form a collection of sets whose geometry is typically much simpler than that of  $F$ , yet retains key information about both  $F$  and  $\Phi$ . In particular, the tiles encode all the scaling data of  $\Phi$ . We give the construction, along with some examples and applications.

The tiling  $\mathcal{T}$  is the foundation for the higher-dimensional extension of the theory of *complex dimensions* which was developed by Lapidus and van Frankenhuysen for the case  $d = 1$ . If time permits, we will elaborate on this and give some connections to geometric measure theory/integral geometry. (Received August 26, 2006)