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Erin P. J. Pearse* (erin-pearse@uiowa.edu), 25L MacLean Hall, Iowa City, IA 52242, and
Michel L. Lapidus and **Steffen Winter**. *Tube formulas and self-similar tilings.*

Let A be a bounded open subset of d -dimensional Euclidean space. A tube formula for A is a function of ϵ that gives the volume of the region lying outside of A but within ϵ of A . Tube formulas are useful for studying curvature and other geometric properties of sets, and have been studied classically by Steiner, Federer, and Weyl.

A type of self-similar tiling is naturally associated to iterated function systems which satisfy a strengthened version of the open set condition. I will describe the conditions under which this tiling allows one to compute the tube formula for the corresponding self-similar set. The resulting formula is an extension of both the Steiner formula of convex geometry and the tube formulas for fractal subsets of the real line from the theory of fractal strings and complex dimensions as developed by Lapidus and van Frankenhuijsen. This is a joint work with Steffen Winter and Michel Lapidus. (Received September 12, 2009)