1023-42-8 **Palle E. T. Jorgensen*** (jorgen@math.uiowa.edu), Department of Mathematics, University of Iowa, Iowa City, IA 52242-1419, and **Dorin E. Dutkay**, Department of Mathematics, Rutgers University, New Brunswick, NJ. *Bases and frames in L^2-spaces in affine iterated function systems (IFS).*

We present joint work with Dorin Dutkay of Rutgers University on a harmonic analysis of a class of affine iterated function systems (IFS), i.e., IFSs defined by a finite set f_i of contractive and affine mappings in some R^d.

The class is determined by three conditions: one is metric, the other geometric, and the third algebraic. The first involves contractivity of the maps in the system, and it guarantees the existence of a unique probability measure μ which is strongly invariant with respect to (f_i). Its support X is a compact subset of R^d. (Examples include twin-dragons.). The second assumption concerns the overlap of the different component sets $f_i(X)$; and finally the third restricting condition sets up a duality between (f_i) and a second complementary IFS. This condition is defined in terms of a certain complex Hadamard matrix, and it is a relatively restrictive condition. Many examples will be given.

The conclusions in our results concern bases (different kinds, including frames) in $L^2(\mu)$, both Fourier bases and wavelet bases. Existence of the first kind of basis in some $L^2(\mu)$ places more constraints on the initial IFS. For both of our constructions we present algorithms (Received April 14, 2006)