http://en.wikipedia.org/wiki/Holonomic_brain_theory

The Holonomic Brain Theory describes a type of cognitive functioning based on Fourier transformations, which convert space-time coordinate systems (x,y,z) into spectral coordinate systems (each point represented as a fractal).???

Fourier transforms may be applied to fractals, but higher level math is required. Connections to wavelet theory
http://www.math.tugraz.at/Fractals09/talks/dutkay.pdf
Lebesgue measure
The Hausdorff measure μ_4 on this Cantor set
The Middle Third Cantor measure
Spectral measure

A NOTE ON THE FOURIER TRANSFORM OF FRACTAL MEASURES

M. BURAK ERDO˜ GAN

Wavelets, Fractals, and Fourier Transforms (Institute of Mathematics and Its Applications Conference Ser) [

Many of the recently developed mathematical techniques used to describe complex algebraic functions and analyze empirical continuous data have been derived from a wide range of signal data from such sources as turbulent flows and oil well logs. Probably the most important and rapidly developing of these techniques involve Fourier methods, fractals, and wavelets. This important collection of essays provides a useful introduction to the mathematics of wavelets, fractals, and Fourier transforms, and to their many applications. The book emphasizes throughout how the different methods of analysis expose very different aspects of complex signals and surfaces, and that the most suitable method of analysis often depends on the application under consideration. It will be of significant interest to researchers, teachers, and students involved in pure and applied mathematics.

http://users.rowan.edu/~polikar/WAVELETS/WTtutorial.html