1154-00-2483 **Nikhil Nagabandi*** (nn318@mynsu.nova.edu), 3308 Chase Jackson Branch, Lutz, FL 33559, and **Elizabeth Melville**. *Can we hear the shape of a fractal? Spectral Consideration in the context of self-similar sets.*

Analytic structures on fractals have been analyzed extensively in the past 50 years both because of their interesting mathematical properties and their potential applications in physics. One important question in this area is how the spectrum of a Laplacian on a fractal reflects its geometry; one version of the corresponding problem for domains in Euclidean space was famously described in Kac's question "Can you hear the shape of a drum?". Our interest is in more precise results that give the locations and multiplicities of eigenvalues explicitly. These are connected to a long strand of research in mathematical physics about the structure of spectra of Schrödinger operators and their relation to topological invariants of the underlying space (prominent results in this area are due to Landau, Peierls, Harper, Moser, Bellissard, and, recently, Avila and Jitomirskaya). One name for these results is gap-labeling theorems. For certain highly-symmetric self-similar sets the computation of the gap structure of the Laplacian spectrum is possible using spectral decimation. We use this method to explicitly compute the gap structure for the Laplacian on a particular two-point self-similar graph and its fractal limit, and for Sierpinski graphs and the Sierpinski gasket. (Received September 17, 2019)