Another look at Sobolev Spaces

Abstract: Let $\Omega$ be a domain in $\mathbb{R}^n$ with smooth boundary, it is well-known that the Sobolev spaces $W^{1,2} (\Omega)$ and $W^{s,2} (\Omega), 0 < s < 1$ are function spaces that are associated with the Laplacian $\Delta$ and the fractional Laplacian $(-\Delta)^s$ respectively. There are extensions of these concepts and setups on certain fractal sets $K$. In this seminar, we will discuss some of the developments; in particular we will consider a theorem of Bourgain, Brezis and Mironescu on the limit behavior of $W^{s,2} (\Omega), s \to 1^-$ to $W^{1,2}$, and the possible extension of the theorem to $K$. 