Department of Mathematics, BGU

Colloquium

On *Tuesday, June ,20 2017*

At *14:30 − 15:30*

In *Math 101-*

Arkady Poliakovsky (BGU)

will talk about

Jumps detection in Besov spaces via a new BBM formula. Applications to Aviles-Giga type functionals

Abstract: Motivated by the formula, due to Bourgain, Brezis and Mironescu, $\lim_{\varepsilon \to 0^+} \int_\Omega \int_\Omega \frac{|u(x)-u(y)|^q}{|x-y|^q} \, \rho_\varepsilon(x-y) \, dx \, dy = K_{q,N} \|\nabla u\|_{L^q}^q$, that characterizes the functions in L^q that belong to $W^{1,q}$ (for $q > 1$(and BV (for $q = 1$,(respectively, we study what happens when one replaces the denominator in the expression above by $|x-y|$. It turns out that, for $q > 1$ the corresponding functionals "see" only the jumps of the BV function. We further identfiy the function space relevant to the study of these functionals, the space BV^q, as the Besov space $B_{q,\infty}^{1/q}$. We show, among other things, that $BV^q(\Omega)$ contains both the spaces $BV(\Omega) \cap L^\infty(\Omega)$ and $W^{1/q,q}(\Omega)$. We also present applications to the study of singular perturbation problems of Aviles-Giga type.