Abstract:

In this talk we will try to discuss the following questions:

1. What is the space of distributions? What are its key properties? Why do we need it? How do we use it?
2. What is a function space? What are the nice properties that we would like our function spaces to possess?
3. Why is the Gagliardo seminorm defined the way it is?
4. How do interpolation theory and Littlewood-Paley theory come into play in the study of Slobodeckij spaces?
5. For what values of $s$ and $p$, $\partial^\alpha : W^{s,p}(\Omega) \to W^{s-|\alpha|,p}(\Omega)$ is a well defined bounded linear operator for all $\alpha \in \mathbb{N}_0^d$? Why do we care about this question?