Author: Li Ying (Shanghai University, China)

Title: **Existence of solutions in fully anisotropic and inhomogeneous Musielak-Orlicz space**

Abstract: In this talk, we first present a direct proof of existence and uniqueness of weak solutions to the following nonlinear elliptic problem:

$$\begin{cases} -\mathrm{div}\big(\mathcal{A}(x,\nabla u) + \Phi(u)\big) + b(x,u) = \mathrm{div}F & \text{in} \quad \Omega, \\ \qquad\qquad u(x) = 0 & \text{on} \quad \partial\Omega, \end{cases}$$

where Ω is a bounded Lipschitz domain in $\mathbb{R}^n$, $n > 1$. The leading part of the operator satisfies general growth conditions settling the problem in the framework of fully anisotropic and inhomogeneous Musielak–Orlicz spaces generated by an N-function $M : \Omega \times \mathbb{R}^n \to \mathbb{R}^+$. No growth hypothesis of doubling type is assumed on the function M. Then, we will introduce two recent results about the existence of renormalized solutions to nonlinear elliptic porblems in the framework of fully anisotropic and inhomogeneous Musielak-Orlicz space.

The talk is based on joint works with Iwona Chlebicka, Arttu Karppinen and Bartosz Budnarowski.