

## Jan BIMA, Charles University (Prague)

### *“Lipschitz Free $p$ -Spaces and Two Related Problems”*

Generalising the concept of Lipschitz free spaces to quasi-Banach spaces, we obtain the notion of *Lipschitz free  $p$ -spaces* for each  $0 < p < 1$ . In my short talk, I will discuss the unique challenges arising from the locally non-convex geometry of Lipschitz free  $p$ -spaces for  $0 < p < 1$ , especially in relation to problems involving Lipschitz free  $p$ -spaces over subsets of finite-dimensional spaces. Specifically, I will elaborate on my journey towards a novel proof technique that was essential for establishing that whenever  $(\mathcal{M}, \rho)$  is an infinite doubling metric space (e.g., an infinite subset of a Euclidean space), then  $\mathcal{F}_p(\mathcal{M}, \rho^\alpha) \simeq \ell_p$  for every  $0 < p \leq 1$  and  $\alpha \in (0, 1)$ . Additionally, I will touch upon the optimal Lipschitz constant of a canonical, locally coordinatewise affine retraction from  $(K, |\cdot|_1)$ , where  $K = \bigcup_{Q \in \mathcal{R}} Q$  is a union of a collection  $\emptyset \neq \mathcal{R} \subseteq \{Rw + R[0, 1]^d : w \in \mathbb{Z}^d\}$  of cubes in  $\mathbb{R}^d$  with side length  $R > 0$ , into the Lipschitz free  $p$ -space  $\mathcal{F}_p(V, |\cdot|_1)$  over their vertices.

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