Abstract: Last week we demonstrated how Khintchine’s inequalities for Rademacher functions could be used to establish the upper estimate in the following Burkholder-type inequality:

\[ C_{-1}^{-1} \|f\|_{L^p(\mathbb{R}^n)} \leq \left\| \left( \sum_{k \in \mathbb{Z}} |D_k(f)|^2 \right)^{1/2} \right\|_{L^p(\mathbb{R}^n)} \leq C_{p,n} \|f\|_{L^p(\mathbb{R}^n)}, \]

where \( f \in L^p(\mathbb{R}^n), \ p \in (1, \infty), \) and \( D_k \) is the dyadic martingale difference operator at scale \( k \in \mathbb{Z} \). In this talk, we will continue with the proof of the Burkholder-type inequality by verifying the lower estimate. In addition, we will provide a detailed proof of Khintchine’s inequalities.