Florian Richter - The Ohio State University

Multiple recurrence along sparse sequences over thick sets (joint with Vitaly Bergelson and Joel Moreira)

Khintchine's classical recurrence theorem states that the set of optimal return times in a measure preserving dynamical system is syndetic, i.e., has bounded gaps. In 1977, as part of his ergodic-theoretic proof of Szemeredi's theorem on arithmetic progressions, Furstenberg established a partial extension of Khintchine's result by showing that the set of multiple return times is also syndetic. Multiple recurrence has since been established along many different types of sequences, including polynomial sequences and sequences derived from functions in a Hardy field. However, they don't always lead to syndetic return time sets. In my talk I will describe joint work with Vitaly Bergelson and Joel Moreira pertaining to a new phenomenon of recurrence in which return time sets are the opposite of syndetic, namely thick (a set is called thick if it contains arbitrarily long intervals). Via Furstenberg's correspondence principle our work leads to novel variants of Szemerédi's theorem.