Speaker: Jens Marklof

Title: Gaps between fractional parts

Abstract: Consider an increasing sequence a_n of real numbers such that its fractional parts are uniformly distributed mod 1. A popular measure for the "randomness" in such a sequence is the gap distribution, i.e., the distribution of gaps between the fractional parts of the first N elements $a_1, \dots, a_N$, in the limit $N \to \infty$. It is surprising how little is known even in the case of very simple sequences, such as $a_n = n^2\sqrt{2}$ or $a_n = n^{1/3}$ where the gap distribution is conjectured to be exponential. I will survey a number of sequences where the gap distribution (and related statistics) can be computed by translating the problem to rather subtle equidistribution problems in the space of affine lattices. This talk is based on joint work with A. Strombergsson (Uppsala) and D. El-Baz and I. Vinogradov (Bristol).