Der Wissenschaftsfonds.

Institute of Analysis and Number Theory

Zahlentheoretisches Kolloquium

Freitag, 20.9.2019, 14:00

Seminarraum Analysis-Zahlentheorie, Kopernikusgasse 24, 2.OG

Equidistribution of random walks

Bence Borda

(TU Graz)

We study the equidistribution properties of random walks on the unit circle. The uniformity of a sequence on the circle can be measured in many different ways; in this talk we shall consider exponential sums, equidistribution in a fixed interval, and discrepancy. We show that under certain conditions these quantities satisfy the law of the iterated logarithm, and we also find their limit distribution. In particular, we give a generalization of the Chung-Smirnov law of the iterated logarithm to random walks.

As an application, we consider subsequences $\{n_k x\}$ of the Kronecker sequence $\{nx\}$. By classical results of Erdös, Gal and Philipp such subsequences are well understood along a fixed lacunary sequence n_k, when x is chosen randomly from the interval [0,1]. We give the counterparts of these results when x is a fixed irrational, and the sequence of positive integers n_k is chosen randomly.

We also mention some results about strong uniform distribution, a theory related to the famous Khintchine's Conjecture. We prove, for instance, that a random walk equidistributes in any given Borel subset of the circle with probability 1 if and only if the random walk has an absolutely continuous component. Time permitting, we also discuss generalizations to random walks on compact metrizable groups. Joint work with Istvan Berkes.

Remark: Bence Borda is a new member of the Institute of Analysis and Number Theory. He will work here as a PostDoc researcher for the next 2 years.

Ch. Aistleitner