Universality of exit times for random walks.

This course is mainly devoted to the study of exit times from cones and corresponding conditional distributions for random walks belonging to the domain of attraction of the Brownian motion. We shall introduce a new approach to exit times, which seems to be much more robust than the classical Wiener-Hopf method. This new approach is based on the standard universality idea and uses the strong approximation of random walks.

1. Classical approach to the study of first-passage times:
   - duality of ladder epochs,
   - pairs of dual stopping times and Wiener-Hopf factorisation,
   - tail behaviour of first-passage times for one-dimensional walks.
2. Universality approach to one-dimensional walks:
   - first-passage times for BM and CLT-heuristic,
   - universality approach to first-passage times of 1-dim walks.
3. Random walks in cones:
   - construction of a positive harmonic function for random walks in cones,
   - tail behaviour of exit times,
   - functional limit theorem for conditioned walks,
   - a local limit theorem for conditioned walks,
   - random walks in Weyl chambers.
4. Other types of universality: one-dimensional walks with moving boundaries.