Prof. Dr. Wolfgang KÖNIG
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Educational Curriculum	1989 Diploma in Mathematics, TU Berlin, Berlin, Germany 1994 PhD, University Zurich, Zurich, Switzerland 2000 Habilitation, TU Berlin
Professional Experience	1990-1994 Assistant, University Zurich 1995 – 2004 Assistant Professor, TU Berlin 2004 – 2009 Professor, University of Leipzig, Germany Since 2009 Professor at TU Berlin and head at WIAS
Current research interest	- Large interacting random processes - Many-body systems and Gibbs measures - Random media - Branching processes - Spectral properties of random operators - Applications in telecommunication
Research methods	- Large deviations, stochastic processes, empirical measures, ergodic theorems
Publications	• **Connection times in large ad-hoc mobile networks** joint work with H. Döring and G. Faraud *Bernoulli* **22:4**, 2143-2176 (2016) • **A Gibbsian model for message routing in highly dense multi-hop networks** joint work with András Tóbiás • **Asymptotic message routing properties in a Gibbsian model in highly dense multi-hop networks** joint work in progress with András Tóbiás

Title of the talk: Random message routing in highly dense multi-hop networks
Abstract of the talk (10 lines):

We investigate a probabilistic model for routing in a multihop ad-hoc communication network, where each user sends a message to the base station. Messages travel in hops via the other users, used as relays. Their trajectories are chosen at random according to a Gibbs

distribution that favours trajectories with low interference, measured in terms of sum of the signal-to-interference ratios for all the hops, and collections of trajectories with little total congestion, measured in terms of the number of pairs of hops arriving at each relay. We derive qualitative properties of this minimizer, like the typical number of hops and the typical length of a hop, and the deviation from the straight line. We encounter and quantify emerging typical pictures in analytic terms in two extreme regimes: (1) in the limit of a large communication area and large distances, and (2) in the limit of a strong interference weight.