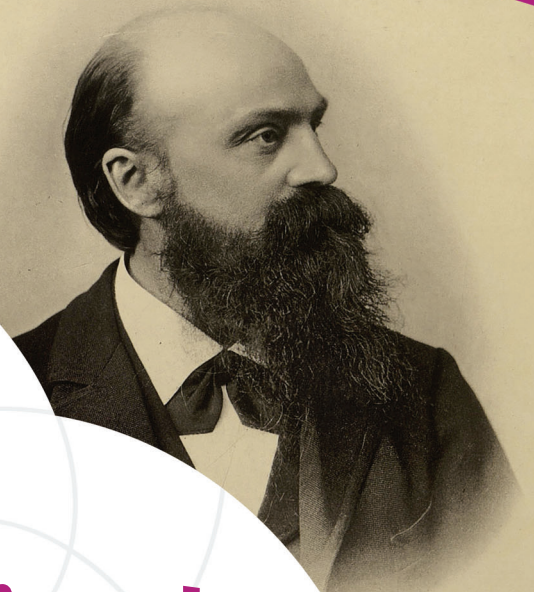


Universität  
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Colloquium Wilhelm Killing

# Random graphs as models of quantum disorder

Prof. Dr. Antti Knowles (University of Geneva)

11 April 2024 | 2:15 pm | M4

A disordered quantum system is mathematically described by a large Hermitian random matrix. One of the most remarkable phenomena expected to occur in such systems is a localization-delocalization transition for the eigenvectors. Originally proposed in the 1950s to model conduction in semiconductors with random impurities, this phenomenon is now recognized as a general feature of wave transport in disordered media, and is one of the most influential ideas in modern condensed matter physics. A simple and natural model of a disordered quantum system is given by the adjacency matrix of a random graph. I report on recent progress in analysing the phase diagram for the Erdős-Renyi model of random graphs. In particular, I explain the emergence of fully localized and fully delocalized phases, which are separated by a mobility edge. Joint work with Johannes Alt and Raphael Ducatez.

**Zoom <<https://www.zoom.us/j/66809935905>> will only be active if a request has been sent to <[mmtech@uni-muenster.de](mailto:mmtech@uni-muenster.de)> by 9 April 2024.**  
**Tea time starts at 3:15 pm in the Cluster Common Room (Orléans-Ring 10, ground floor).**

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