Speaker: **Yannis Seim, University of Freiburg**

Title: **Analysis of Non-Hermitian Hamiltonians via Singular Value Decomposition**

Date: **Friday, April 11th, 15:00 pm**

Place: **Seminar room 915**

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Abstract:

The study of open quantum systems is an active area of fundamental research, with numerous applications ranging from atomic physics to quantum information processing. One of the methods of treating open quantum systems is based on non-Hermitian Hamiltonians. We deal with the properties of the singular value decomposition and its applicability to the analysis of non-Hermitian quantum systems. Furthermore, we address the issues that appear when one uses singular value decomposition, instead of eigendecomposition, to deal with non-Hermitian quantum systems. We evaluate the singular value decomposition with respect to its application in physics and compare it to the eigendecomposition of matrices. Then we present the behaviour of singular values and eigenvalues of Hamiltonians under non-Hermitian perturbations and we prove a number of results concerning eigenvalues and singular values. Moreover, we analyse the statistical properties of singular values and eigenvalues of simple physical models based on random matrices.