

# African-European Early-Career Network for Mathematical Analysis and Related Fields



Meeting 10.04.26 17:00-19:00 CET

## *Program*

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Math Talk | 45 min

### **Computation of the Density of States of Random Schrödinger Operators via Supersymmetry**

By Liza Schonlau, University of Bonn, Germany

Abstract: The random Schrödinger operator  $H$  acting in  $\ell^2(\mathbb{Z}^d)$  is given by  $H = -\Delta + \lambda V$  with  $\lambda > 0$  and  $-\Delta$  the discrete Laplacian and  $V = (V_x)_{x \in \mathbb{Z}^d}$  a random potential. The mean Density of States (DOS) counts the average number of eigenvalues of  $H$  per energy and per volume. To study the DOS, one can represent it as a Gaussian integral over supervectors, that is, vectors that contain both commuting and anti-commuting variables (the latter are usually called Grassmann variables). In this talk, I will introduce you to Grassmann calculus and supersymmetric integrals and I will demonstrate how these concepts can be used to calculate the exact mean DOS for random Schrödinger operators with a Cauchy-distributed potential.

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Math Talk | 30 min

### **Lack of Compactness in a 1-D Transmission Problem with Kelvin-Voigt Damping**

By Ignatius Nyendah, Kwame Nkrumah University of Science and Technology, Ghana

Abstract: We consider the 1-D version of a transmission problem between a (thermo)viscoelastic system with Kelvin-Voigt damping and a purely elastic system. In this case, we show that the inverse of the operator associated with the arising semigroup is not compact.