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### **Some new applications of the asymptotic behaviour of entropy and Weyl numbers to spectral theory**

The aim of the talk is to describe some new results in spectral theory of elliptic operators related to the asymptotic behaviour of entropy and Weyl numbers of Sobolev embeddings. We will focus on the following three problems:

- asymptotic behaviour of entropy numbers of compact embeddings of weighted Besov and Triebel-Lizorkin spaces with Muckenhoupt weights. The result allows to improve known estimates of eigenvalues of compact degenerate elliptic (pseudo)-differential operators with local singularities, as well as estimates of negative eigenvalues of some Schrödinger type operators,
- entropy numbers of Sobolev embeddings of function spaces defined on quasi-bounded domains and the spectral properties of elliptic (pseudo)-differential operators defined on the quasi-bounded domains,
- Weyl numbers of Sobolev embeddings of weighted spaces with sub-polynomial weights and the asymptotic behaviour of the corresponding compact elliptic operators.

Presented results are the outcomes of the joint works with Dorothee D. Haroske, Hans-Gerd Leopold and Alicja Gąsiorowska.