

# Meeting on Computational and Analytic Problems in Spectral Theory

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## Abstract of Talk

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### EFFECTIVE HAMILTONIANS FOR SPECTRAL ASYMPTOTICS OF ROBIN LAPLACIANS

Konstantin Pankrashkin

Laboratoire de Mathématiques d'Orsay, Univ. Paris-Sud, CNRS, Université Paris-Saclay, 91405 Orsay, France

For an open set  $\Omega \subset \mathbf{R}^d$  with a suitably regular boundary and a constant  $\alpha > 0$ , denote by  $Q_\alpha^\Omega$  the Laplacian  $u \mapsto -\Delta u$  acting in  $L^2(\Omega)$  on the functions  $u$  satisfying the Robin boundary conditions  $D_n u = \alpha u$  on  $\partial\Omega$ , where  $D_n$  is the outer unit normal derivative.

On the other hand, denote by  $M$  be the sum of the principal curvatures, which is defined on  $\partial\Omega$ , and consider the Schrödinger operator

$$L_\alpha^\Omega := -\Delta_{\partial\Omega} - \alpha M$$

acting in  $L^2(\partial\Omega)$ , where  $\Delta_{\partial\Omega}$  is the Laplace-Beltrami operator.

We show that in various situations there is a link between the spectral properties of  $Q_\alpha^\Omega$  and those of  $L_\alpha^\Omega$ . In particular, we discuss the eigenvalue asymptotics for  $\alpha \rightarrow +\infty$  and the behavior of the discrete spectrum on conical domains.

The talk is based on joint works with Vincent Bruneau and Nicolas Popoff (Bordeaux).