

# GROUP ACTIONS, SUBSHIFTS AND SPECTRA

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We will discuss a recently discovered connection between the spectral theory of Schrödinger operators whose potentials exhibit aperiodic order, and that of Laplacians associated with certain interesting group actions, as, for example, the action of Grigorchuk's group of intermediate growth on the boundary of the infinite binary tree. The connection goes through a subshift associated with the action; in many cases it is given by a substitution over a finite alphabet that defines the group algebraically, via a recursive presentation by generators and relators. Our results allow us to apply methods from the theory of aperiodic order to deduce information about the spectra of the Laplacians. We then study the dependence of the subshift, the Laplacians and their spectra on the group, as a point in the space of marked groups. The talk is chiefly based on the two joint papers listed below, but will also contain some new as yet unpublished results.

## References

1. *Grigorchuk R., Lenz D., Nagnibeda T.* Schreier graphs of Grigorchuk's group and a subshift associated to a non-primitive substitution // Groups, Graphs, and Random Walks / Ed. by T. Ceccherini-Silberstein, M. Salvatori, E. Savat-Huss. Cambridge: Cambridge Univ. Press, 2016. (LMS Lect. Note Ser.). To appear.
2. *Grigorchuk R., Lenz D., Nagnibeda T.* Spectra of Schreier graphs of Grigorchuk's group and Schroedinger operators with aperiodic order: E-print. arXiv: 1412.6822.