HARISH-CHANDRA MODULES OVER $\mathrm{SL}(2,\mathbb{R})$ AND THEIR SILTING COMPLEXES

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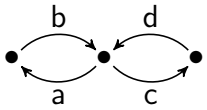
At the ICM in 1972 Gelfand reduced the study of Harish-Chandra modules over the Lie group $\mathrm{SL}(2,\mathbb{R})$ to the study of nilpotent representations over the quiver



$\mathsf{b}\,\mathsf{a} = \mathsf{d}\,\mathsf{c}.$

The completed path algebra Λ of this quiver yields a paradigm of a *nodal order*, which is an infinite-dimensional analogue of a (skew-)gentle algebra.

In 2004 Burban and Drozd proved that any nodal order is *derived tame*, and gave a combinatorial description of its indecomposable projective complexes. These can be divided into four classes: *usual*, *special* and *bispecial strings*, and *bands*.

In my talk, I will present the main results of my PhD thesis and joint work with Igor Burban (University of Cologne) on the Gelfand algebra Λ:

- A *homological characterization* of the four classes of strings and bands.
- An explicit description of the *projective resolutions* of indecomposable Λ-modules, their main functorial properties and basic homological invariants.
- A description of the *derived Auslander-Reiten translation* on any string or band.
- A classification of the *silting complexes* in the derived category $\mathrm{D}^{\mathrm{b}}(\Lambda\text{-}\mathrm{mod})$ of finitely generated Λ-modules.

At last, I will discuss generalizations of these results to nodal orders.