An introduction to silting objects and silting modules

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The work of Aihara-Iyama and Adachi-Iyama-Reiten shows that mutation in cluster theory can be studied in terms of the notion of a silting complex. In this lecture series we will consider non-compact silting complexes over an arbitrary ring, and more generally, silting objects in triangulated categories, together with their associated t-structures and co-t-structures. We will then focus on silting modules, the module theoretic counterparts of 2-term silting complexes. They generalise tilting modules over an arbitrary ring, as well as support τ-tilting modules over a finite dimensional algebra. We will discuss their role in localisation theory. For example, for hereditary rings, silting modules parametrize universal localisations and wide subcategories of finitely presented modules. As a consequence, we will see that the universal localisations of a finite dimensional hereditary algebra form a lattice which completes the poset of noncrossing partitions. We will discuss this lattice also for finite dimensional algebras of finite representation type, and more generally, for τ-tilting finite algebras.

References

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