



# ALGEBRA AND GEOMETRY SEMINAR

The Hong Kong University of Science and Technology  
Department of Mathematics

## **Koszulity for semi-infinite highest weight categories**

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Koszul algebras are positively graded algebras with very amenable homological properties. Typical examples are the polynomial ring over a field or the exterior and symmetric algebra of a vector space. A category is called Koszul if it has a grading with which it is equivalent to the category of graded modules over a Koszul algebra. A famous example (due to Soergel) is the principal block of category  $\mathcal{O}$  for a semisimple Lie algebra. Koszulity is a very nice property but often very difficult to check. I will give a criterion which allows to check Koszulity in case the category is a graded semi-infinite highest weight category (which is a structure that appears often in representation theory). This is joint work with Jonas Nehme and Catharina Stroppel.

Room 3598 (Lift 27/28) Wed, Apr 1, 2026 04:00 PM

