The Kostant form of $\mathfrak{U}(sl_n^+)$ and the Borel-Schur algebra

Ana Paula Santana and Ivan Yudin

CMUC, University of Coimbra, Portugal

ABSTRACT

In 1981, S. Donkin proved that the Schur algebra for the general linear group has finite global dimension. This led to the problem of describing explicit projective resolutions of the Weyl modules for the Schur algebra.

Let R be a commutative ring and denote by $\mathfrak{U}_n^+(R)$ the Kostant form over R of the universal enveloping algebra of the Lie algebra of $n \times n$ complex nilpotent upper triangular matrices. In this talk I will explain the construction of functors that map (minimal) projective resolutions of the rank-one trivial $\mathfrak{U}_n^+(R)$-module to (minimal) projective resolutions of rank-one modules for the Borel-Schur algebra. Using Woodcock's Theorem, from these resolutions one can easily obtain projective resolutions of the Weyl modules for the Schur algebra.