

# Colloquium

University of Notre Dame  
Department of Mathematics

**Speaker:** Cristian Lenart

State University of New York, Albany

**Will give a lecture entitled**

Affine Lie algebras, quantum K-theory, and  
combinatorics

**Date:** Wednesday, November 30, 2016

**Time:** 4:00 PM

**Location:** 117 Hayes-Healy Hall

**Departmental Tea:** Tea in Room 257 (lounge in Hurley Hall) at 3:30 p.



**Abstract:**

The connections between representations of Lie algebras and the geometry of the corresponding flag varieties  $G/B$  have a long history; moreover, combinatorics is known to play an important role in the related computations. My talk is devoted to new aspects of this story. On the Lie algebra side, I consider certain finite-dimensional modules for affine Lie algebras, known as Kirillov-Reshetikhin modules. I discuss their relationship with Macdonald polynomials, which generalize the irreducible characters of simple Lie algebras. On the geometric side, I consider the quantum K-theory of flag varieties, which is a K-theoretic generalization of quantum cohomology. A new combinatorial model is also presented. The talk is based on joint work with S. Naito, D. Sagaki, A. Schilling, and M. Shimozono.