

2017 Distinguished Lecture Series

UCLA Department of Mathematics

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Lecture 1

Tuesday, January 24, 2017
3:00 - 3:50 p.m.
MS 6627

Lecture 2

Wednesday, January 25, 2017
3:00 - 3:50 p.m.
MS 6627

Lecture 3

Thursday, January 26, 2017
3:00 - 3:50 p.m.
MS 6627

Lecture 1: Geometric categorification and representation theory

Representation theory is a branch of algebra studying the algebraic structure of symmetries. Somewhat akin to the famous phenomenon of "unreasonable effectiveness" of mathematics in physical sciences is the "unreasonable" effectiveness of algebraic geometry in algebra: several core results and concepts of algebraic geometry turned out to carry a surprisingly strong connection to problems of representation theory. A classical example of such a connection is provided by the celebrated Kazhdan-Lusztig conjectures proved by Beilinson-Bernstein and Brylinsky-Kashiwara around 1980. In the I talk will briefly survey this classical story and focus on other more recent examples of such connections.

Lecture 2 and 3: Geometry and algebra of quantized symplectic resolutions

Much of the classical representation theory deals with modules over the enveloping of a semi-simple Lie algebra. From a geometric perspective, these algebras can be thought of as examples of a quantized rings of functions on a symplectic singularity. A recent direction is devoted to generalizing those classical results to quantizations of other symplectic singularities. I will describe some results and conjectures in this subject involving constructions of algebro-geometric interest.