



**Date and Time:** November 18, 2021, from 1:00 pm to 1:50 pm

**Speaker:** Drazen Adamovic, Ph.D. (University of Zagreb, Croatia)

**Title:** On the semisimplicity of the category  $KL_k$  for affine vertex superalgebras

**Abstract:** One of the most basic but fundamental questions in the representation theory of Lie (super)algebras is to prove complete reducibility for certain categories of modules. In the case of infinite-dimensional Lie superalgebras, this question is naturally related to the representation theory of affine vertex algebras. In this talk we will discuss affine vertex algebras beyond admissible levels, where classical Lie theoretic methods are currently not sufficient for a complete determination of the category of weight modules. A level  $k$  is called collapsing if the simple affine  $W$ -algebra at level  $k$  associated with simple Lie algebra is isomorphic to its affine vertex subalgebra. We present a proof of the semi-simplicity of the Kazhdan-Lusztig category  $KL$  of affine vertex superalgebras at collapsing and some other levels. The proof uses the representation theory of affine vertex algebras at collapsing levels and concepts from the theory of conformal embeddings. In the Lie superalgebra case, we discuss some examples when  $KL_k$  has indecomposable highest weight modules and explain what is a possible implication of this in the representation theory of vertex algebras.

The talk is motivated by the series of joint papers with V. Kac, P. Moseneder-Frajria, P. Papi, O. Perse and I. Vukorepa.

**About Speaker:** Dr. Adamovic is a full professor in Mathematics at University of Zagreb, Croatia. His research interests are in vertex operator algebras, conformal field theory, infinite-dimensional Lie algebras and superalgebras.

Dr. Adamovic received Croatia National Science Award in 2009, an award of the Croatian academy of Sciences and Arts in 2012. In 2020, Dr. Adamovic is on the list of 2% most cited scientists for general mathematics. Moreover, he is an editor for European Journal of Mathematics, the editor-in-chief for Glasnik Matematički, and an editor for Mathematical Communications.

### **Zoom Meeting Information**

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