Online ISU Algebra Seminar

Date and Time: September 9, 2021, from 1:00 pm to 2:00 pm

Speaker: Gaywalee Yamskulna, Ph. D. (Illinois State University)

Title: On Representation Theory of Weyl Vertex Algebra

Abstract: The theory of vertex algebras is an area at the crossroads of pure mathematics and physics that has demonstrated the power to uncover solutions to concrete mathematical problems and reveal subtle conceptual and phenomenological mathematical and physical structure within conformal field theories such as string theory. Up to now, a large portion of the literature on the study of vertex algebras and their representations both from mathematical and physical standpoint has been devoted to the study of vertex algebras whose module category is semi-simple. However, the discovery of aspects of logarithmic conformal field theory has changed the landscape of the study of the representation theory of vertex algebras. Mathematicians and physicists have begun to pay closer attention to irrational vertex algebras (i.e., vertex algebras whose module category is non-semi-simple) and their indecomposable non-simple modules.

In this talk, I will discuss about an investigation on representation theory of the irrational Weyl Vertex algebra at various central charges. I will describe how to use many types of Zhu algebras to classify modules of Weyl vertex algebra.

This talk is based on my joint work with D. Addabbo, K. Barron, K. Batistelli, F. Orosz-Hunziker, and V. Pedic.

About Speaker:
Dr. Yamskulna graduated from Chulalongkorn University, Thailand in 1996 with a bachelor's degree in mathematics, and from the University of California at Santa Cruz (UCSC) in 2001 with a Ph.D. in Mathematics. Throughout her undergraduate and graduate education (1992- 2001), Dr. Yamskulna was supported by a Fellowship from the Development and Promotion of Science and Talents Projects which is one of the most prestigious fellowships awarded by the Government of Thailand. Dr. Yamskulna also received a Graduate Fellowship from the Fields Institute in Fall 2000. Before joining the ISU mathematical sciences faculty in Fall 2004, Dr. Yamskulna was a Postdoctoral Fellow at the Mathematical Sciences Research Institute, Berkeley, in Spring 2002 and a Visiting Assistant Professor at the State University of New York at Binghamton from Fall 2001 to Spring 2004. Currently, Dr. Yamskulna is a full professor and associate chair of Mathematics Department. Her research interest is in representation theory of (super) vertex algebras. She is particularly interested a study of representation theory of N-grade vertex algebras, and the Mathieu Moonshine conjecture.

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