

Workshop on Vertex Algebra and Related Fields

Hefei·Anhui
April 12-15, 2026

Conference Manual

**School of Mathematical Sciences
University of Science and Technology of China**

Organizers

Bailin Song (University of Science and Technology of China)
Bin Xu (University of Science and Technology of China)

Contact

Bailin Song bailinso@ustc.edu.cn & 18110909923

Venue

Fifth Teaching Building 5101 (**Monday**) (五教)
Management R&D Building 1418 (**Tuesday**) (管理科研楼)

(East Campus of University of Science and Technology of China)

Accommodation

Atour Hotel (No. 254 Huangshan Road)
亚朵酒店 (黄山路254号)

Lunch

the 2nd floor of Guest House
(专家楼 2 楼)

Dinner

April 13: Huangshan Hall, the 1st floor of Guest House
(专家楼黄山厅)

April 12 and 14: the 3rd floor of Active Center of East Campus
(东区活动中心 3 楼教师餐厅)

Schedule

April 12 (Sunday)

Time	
12:00-18:00	Arrival

April 13 (Monday)

Fifth Teaching Building (五教) 5101

Time	Speaker	Title	Chair
9:20-9:30	Wen Huang	Welcome Address	
9:30-10:15	Tomoyuki Arakawa	Chiral differential operators on classical invariant rings	Ching Hung Lam
10:20-11:05	Yongchang Zhu	On genus-one conformal blocks of vertex operator algebras	Ching Hung Lam
Coffee Break			
11:25-12:10	Li Ren	Generalized symmetries from fusion actions	Xingjun Lin
Lunch (the 2 nd floor of Guest House)			
14:30-15:15	Bin Gui	Conformal blocks and associative algebras in logarithmic conformal field theory	Yongchang Zhu
15:25-16:10	Xingjun Lin	Module category of affine vertex operator algebra $L_{-1}(sp(2n))$	Yongchang Zhu
Coffee Break (Photography)			
16:50-17:35	Xuanzhong Dai	Chiral differential operators on the base affine space	Li Ren
Dinner (Huangshan Hall, the 1 st floor of Guest House)			

April 14 (Tuesday)

Management R&D Building (管理科研楼) 1418

Time	Speaker	Title	Chair
9:30-10:15	Ching Hung Lam	Modular lattice vertex algebras	Tomoyuki Arakawa
10:20-11:05	Wenbin Yan	CY singularities and VOAs	Tomoyuki Arakawa
Coffee Break			
11:25-12:10	Robert McRae	A tensor category construction of the $W_{p,q}$ triplet vertex operator algebra and applications	Bin Gui
Lunch (the 2 nd floor of Guest House)			
14:00-16:00	Free Discussion		
Dinner (the 3 rd floor of Active Center of East Campus)			

April 15 (Wednesday)

Time	
8:00-18:00	Departure

Abstracts

Chiral differential operators on classical invariant rings

Tomoyuki Arakawa

(Okinawa Institute of Science and Technology)

Abstract: Localizations of vertex algebras and their modules were introduced by Malikov, Schechtman, and Vaintrob, and later further developed by Borisov.

I will begin the talk with a review of the theory of localization of modules over vertex algebras.

I will then apply this framework to construct infinitely many new quasi-lisse vertex algebras as chiralizations of differential operators on classical invariant rings.

This is joint work with Xuanzhong Dai and Bailin Song.

Chiral differential operators on the base affine space

Xuanzhong Dai

(Okinawa Institute of Science and Technology)

Abstract: Using BRST reduction, we construct chiral analogues of differential operators acting on classical invariant rings, associated with vector bundles on smooth open subvarieties of affine GIT quotients. As an application, we apply this framework to the base affine space, which provides computable examples of sheaves of chiral differential operators whose global sections are quasi-lisse vertex algebras. This talk is based on joint work with Tomoyuki Arakawa and Bailin Song.

Conformal blocks and associative algebras in logarithmic conformal field theory

Bin Gui

(Tsinghua University)

Abstract: A main theme in the development of the theory of vertex operator algebras (VOAs) is the factorization property. If V is a C_2 -cofinite rational VOA (which corresponds to the chiral algebra of a rational CFT in physics), the factorization property---saying roughly that higher genus conformal blocks can be decomposed into lower genus ones---was recently completely proved. Its low genus special cases (such as Zhu's modular invariance theorem in 1996 and Huang's associativity theorem for intertwining operators in 2005) are crucial to the understanding of the representation theory of V .

This talk focuses on C_2 -cofinite VOAs that are not necessarily rational. Such VOAs correspond to chiral algebras of finite-type logarithmic CFTs. Since their representation categories are not necessarily semisimple, the study of their conformal blocks differ significantly from the rational case. In this talk, I will present my recent joint work with Hao Zhang on the complete proof of the factorization property for conformal blocks of such VOAs. We will also discuss the natural associative algebras in log CFT that play the role of Zhu's algebra in rational CFT. In particular, we show that the 0-th order Hochschild cohomology of that algebra is isomorphic to the space of torus conformal blocks. This is based on our works arXiv:2503.23995 and arXiv:2508.04532.

Modular lattice vertex algebras

Ching Hung Lam

(Institute of Mathematics, Academia Sinica)

Abstract: A vertex operator algebra V_L associated with a positive definite even lattice L has a standard integral form, which we denote it by $V_{L,\mathbb{Z}}$. This integral form may be used to define a vertex algebra over a commutative ring R . If F is a field of characteristic $p > 0$, it is known that $F \otimes_{\mathbb{Z}} V_{L,\mathbb{Z}}$ is a simple vertex operator algebra over F if and only if $(p, \det(L)) = 1$.

In this talk, we will discuss the case when the characteristic of F divides $\det(L)$. In this case, $V_{L,F} = F \otimes_{\mathbb{Z}} V_{L,\mathbb{Z}}$ is not simple. We will describe the unique maximal ideal J of $V_{L,F}$ and the simple quotient $V_{L,F}/J$.

It is a joint work with Robert Griess.

Module category of affine vertex operator algebra $L_{-1}(sp(2n))$

Xingjun Lin

(Wuhan University)

Abstract: The affine vertex operator algebra $L_{-1}(sp(2n))$ is an orbifold of $L_{-1}(sl(2n))$. Irreducible ordinary modules of a $L_{-1}(sp(2n))$ have been classified. In this talk, I will discuss the structure of minimal affine W-algebra $W_{-1}(sp(2n), e_{-\theta})$. Then I will discuss semisimplicity of certain module category of $L_{-1}(sp(2n))$. This talk is based on joint work with Drazen Adamovic and Jinwei Yang.

A tensor category construction of the $W_{p,q}$ triplet vertex operator algebra and applications

Robert McRae

(Tsinghua University)

Abstract: The triplet vertex operator algebra $W_{p,q}$ for coprime integers $p, q \geq 2$ is defined as the intersection of the kernel of two screening operators acting on a rank 1 lattice vertex operator algebra. In this talk, I will discuss a new construction of $W_{p,q}$ using a tensor category of representations of the universal Virasoro vertex operator algebra at central charge $1 - \frac{6(p-q)^2}{pq}$. An application of the construction is an obvious action of $PSL(2, \mathbb{C})$ on $W_{p,q}$ by vertex operator algebra automorphisms. This talk is based on joint work with my previous Ph.D. student Valerii Sopin.

Generalized symmetries from fusion actions

Li Ren

(Sichuan University)

Abstract: I will discuss our recent investigation into generalized symmetries arising from condensable algebras in modular tensor categories. The main results include Schur–Weyl duality, a Galois correspondence, and a theory of generalized orbifolds for vertex operator algebras. This is joint work with Chongying Dong, Siu-Hung Ng, and Feng Xu.

CY singularities and VOAs

Wenbin Yan

(Tsinghua University)

Abstract: I will explain a map from isolated hypersurface Calabi-Yau 3 singularities to vertex operator algebras motivated from string theory and 4d/VOA correspondence. I will also show that central charges and vacuum characters of VOA can be obtained from the deformation of singularities, while associated variety of VOA can be obtained from the resolution of singularities. In some examples, VOAs from singularities are affine W-algebras. However, in other examples, this map gives new quasi-lisse VOAs.

On genus-one conformal blocks of vertex operator algebras

Yongchang Zhu

(Tsinghua University)

Abstract: We discuss the properties and structures of conformal blocks of vertex operator algebras on Riemann surfaces of genus one, along with the corresponding correlation functions. The results for quasi-lisse VOAs and the affine vertex algebra will be discussed in detail.

