



陈省身数学研究所
CHERN INSTITUTE OF MATHEMATICS

International Conference on Vertex Algebra, Category Theory and Related Topics

程序册

Chern Institute of Mathematics,
Nankai University

July 12-16, 2026

International Conference on Vertex Algebra, Category Theory and Related Topics

July 12-16, 2026

Organizing Committee

- Chengming Bai (Nankai University)
- Chongying Dong (University of California at Santa Cruz)
- Cuibo Jiang (Shanghai Jiaotong University)
- Li Ren (Sichuan University)
- Feng Xu (University of California Riverside)

Supported by

Chern Institute of Mathematics, Nankai University

Information for participants of the 2026 international conference on vertex algebra, category theory and related topics

Chern Institute of Mathematics, Nankai University, July 12-16, 2026

➤ Registration: 14:00-20:00, July 12, 2026, Place: Jiayuan Hotel (Guest House of Chern Institute), Nankai University.

➤ During July 12-16, all participants will have meals in the restaurant of the Jiayuan Hotel.

Breakfast 7:20-8:20; Lunch 12:00-13:00; Dinner 18:00-19:00

On July 14, there will be a **conference banquet** at 18:00.

➤ All talks are scheduled in Seminar Room **216** on the 2nd floor of the Chern Institute (Shiing-Shen Building).

➤ Wireless network at Chern Institute:

Wifi:cim-visitor, ID:guest, Password:edba2j56k9

The Wifi is free of charge at the Jiayuan Hotel.

➤ Participants are requested to bring the ID card or Participant card when entering and leaving the campus gate during the conference.

➤ Contact Information

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Schedule of Lectures

July 13th (Monday)

Time	Speaker	Title	Host
8:10-8:30	Group Photo 合影		
8:30-9:00	Opening Ceremony 开幕式		
9:00-9:45	Drazen Adamovic	On some nonstandard coincidences between tensor categories for affine and Virasoro vertex operator algebras	Chongying Dong 董崇英
9:50-10:35	Siu-Hung Ng 吴少雄	Automorphisms of condensable algebras	
10:35-11:00	Tea Break 茶歇		
11:00-11:45	Xuanzhong Dai 戴烜中	Feigin-Semikhatov duality at the critical level	
12:00	Lunch 午餐		
14:30-15:15	Haisheng Li 李海生	Deformation construction of quantum vertex algebras	Dong Liu 刘东
15:20-16:05	Kaiming Zhao 赵开明	Representations of the differential operator superalgebra	
16:05-16:30	Tea Break 茶歇		
16:30-17:15	Jianzhi Han 韩建智	Derivations of rational VOAs	
18:00	Dinner 晚餐		

July 14th (Tuesday)

Time	Speaker	Title	Host
9:00-9:45	David Ridout	Bosonic ghost correlation functions	Li Ren 任丽
9:50-10:35	Ethan Fursman	Reduction functors	
10:35-11:00	Tea Break 茶歇		
11:00-11:45	Xu Gao 高煦	Strong Identities and Algebraic Smoothing via Almost-Canonical Seminorms	
12:00	Lunch 午餐		
14:30-15:15	Nils R. Scheithauer	Vertex algebras and automorphic forms on orthogonal groups	Nina Yu 余妮娜
15:20-16:05	Haowu Wang 王好武	Singular automorphic products and BKM Lie algebras	
16:05-16:30	Tea Break 茶歇		
16:30-17:15	Kaiwen Sun 孙凯文	VOA and Magic Triangle	
18:00	Conference Banquet 晚宴		

July 15th (Wednesday)

Time	Speaker	Title	Host
9:00-9:45	Zhengwei Liu 刘正伟	Functional Integral Construction of Topological Quantum Field Theory	Xingjun Lin 林兴君
9:50-10:35	Yilong Wang 王亦龙	Modular fusion categories with trivial Torelli group actions	
10:35-11:00	Tea Break 茶歇		
11:00-11:45	Fei Kong 孔非	Quantum affine vertex algebra at root of unity	
12:00	Lunch 午餐		
14:30-15:15	Wenbin Yan 颜文斌	CY singularities and VOAs	Qiang Mu 穆强
15:20-16:05	Bailin Song 宋百林	Zhu's algebras and C_2 -algebras of classically free vertex operators algebras	
16:05-16:30	Tea Break 茶歇		
16:30-17:15	Yukun Xiao 肖毓琨	Sub-structure in module categories of several vertex operator algebras	
18:00	Dinner 晚餐		

July 16th (Thursday)

Time	Speaker	Title	Host
9:00-9:45	Ching Hung Lam 林正洪	Extra automorphisms of cyclic orbifolds of lattice VOAs	Wei Zhang 张伟
9:45-10:15	Tea Break 茶歇		
10:15-11:00	Xiangyu Jiao 焦翔宇	Twisted fusion rules of lattice VOAs via crossed S-matrix	
12:00	Lunch 午餐		

Abstracts

Speaker: Drazen Adamovic (University of Zagreb)

Title: On some nonstandard coincidences between tensor categories for affine and Virasoro vertex operator algebras

Abstract: The affine VOAs associated with $\mathfrak{sl}_2$ and Virasoro minimal models are classically related through quantum Hamiltonian reduction and the GKO coset construction. In this talk, I will discuss a different type of relation, arising from character identities between affine and Virasoro VOAs and their modules. In particular, for integral levels these identities lead to unexpected coincidences between the corresponding strongly rational representation categories. I will also mention extensions to admissible and nonadmissible levels, where similar identities suggest further connections with vertex algebras appearing in logarithmic conformal field theory. A connection between affine and Virasoro Whittaker modules will also be discussed. This is joint work with Sven Möller.

Speaker: Xuanzhong Dai 戴烜中 (Okinawa Institute of Science and Technology)

Title: Feigin-Semikhatov duality at the critical level

Abstract: The Feigin--Semikhatov duality states that the Heisenberg cosets of the subregular W -algebra associated with $\mathfrak{sl}_n$ (resp. $\mathfrak{so}_{2n+1}$) and the principal W -superalgebra associated with $\mathfrak{sl}_{n|1}$ (resp. $\mathfrak{osp}_{2|2n}$) are isomorphic whenever their levels satisfy the Feigin--Frenkel relation. We realize the centerless subregular W -algebra at the critical level as an orbifold of the large-level limit of the corresponding principal W -superalgebra tensored with a lattice vertex operator algebra. This construction induces a functor between suitable categories of modules for the two vertex algebras, and we prove that it yields equivalences between corresponding blocks. As an application, we determine the structure of the principal block of the subregular W -algebra in the category of weight modules, a substantially larger category than the more commonly studied category of lower-bounded modules, by analyzing the principal block of the large-level limit of the principal W -superalgebra. This is joint work with T. Creutzig and B. Song.

Speaker: Ethan Fursman (University of Melbourne)

Title: Reduction functors

Abstract: An important family of vertex algebras are the affine W-algebras, which are constructed via a homological functor known as quantum hamiltonian reduction. The representation theory of these W-algebras and their associated affine vertex algebras can be related through reduction and inverse reduction functors. Studying such representation theory provides examples of monoidal categories which are not semisimple and have infinitely many isomorphism classes of simples, but may still have familiar properties like rigidity.

In recent work with David Ridout and Justine Fasquel (arXiv:2605.19708), we have developed extensions of these tools, called composition functors. In this talk, I will discuss how they can be used to determine how reduction functors map important families of representations called 'fully-relaxed' modules, including their twists by spectral flow automorphisms. I will also discuss how similar techniques may be applied to study partial reductions.

Speaker: Xu Gao 高煦 (Tongji University)

Title: Strong Identities and Algebraic Smoothing via Almost-Canonical Seminorms

Abstract: In the vertex operator algebra framework of two-dimensional conformal field theory, analytic sewing reconstructs conformal blocks by gluing Riemann surfaces and inserting dual pairs of VOA modules. An algebraic counterpart, developed through the mode transition algebra, reconstructs conformal blocks by smoothing nodal curves. However, this algebraic construction depends on a technical-looking condition: the strong identity condition (SIC).

The purpose of this talk is to explain what this condition really measures. I will describe how enveloping algebras of VOAs naturally lead to a class of topological graded algebras called almost-canonically seminormed rings, and how the strong identity condition can be characterized in this setting from several distinct perspectives. The main point is that: SIC is equivalent to a Zhu-type reconstruction principle. For VOAs of CFT type, algebraic smoothing via the mode transition algebra succeeds precisely when the Zhu algebra reconstructs admissible modules by induction. This gives a representation-theoretic explanation for the gap between algebraic smoothing and analytic sewing in non-semisimple examples.

Speaker: Jianzhi Han 韩建智 (Tongji University)

Title: Derivations of rational VOAs

Abstract: In this talk, we show that every derivation of a simple and rational VOA of CFT type is an inner derivation.

Speaker: Xiangyu Jiao 焦翔宇 (East China Normal University)

Title: Twisted fusion rules of lattice VOAs via crossed S-matrix

Abstract: We study fusion rules among twisted modules of lattice vertex operator algebras associated with automorphisms of prime order. Our approach is based on crossed S-matrix entries and the twisted Verlinde formula. This talk is based on ongoing joint work with Xingjun Lin.

Speaker: Fei Kong 孔非 (Hunan Normal University)

Title: Quantum affine vertex algebra at root of unity

Abstract: Let $\mathfrak{g}$ be a finite simple Lie algebra, and let r denote the ratio of the square length of long roots to that of short roots. Let $p > 2r$ be an integer and ξ a primitive p -th root of unity. Denote by $\mathcal{U}_\xi(\widehat{\mathfrak{g}})$ the Lusztig big quantum affine algebra at root of unity defined by divided powers. In this paper, we establish a current algebra presentation of $\mathcal{U}_\xi(\widehat{\mathfrak{g}})$. Based on this presentation, we construct a $\mathbb{Z}_p$ -module quantum vertex algebras $V_{p,\tau}^\ell(\mathfrak{g})$ for each integer ℓ . Moreover, we establish a fully faithful functor from the category of smooth weighted $\mathcal{U}_\xi(\widehat{\mathfrak{g}})$ -modules of level ℓ to the category of $(\mathbb{Z}_p, \chi_\phi)$ -equivariant ϕ -coordinated quasi-modules of $V_{p,\tau}^\ell(\mathfrak{g})$, where $\chi_\phi: \mathbb{Z}_p \rightarrow \mathbb{C}^\times$ is the group homomorphism defined by $s \mapsto \xi^s$. We also determine the image of this functor. The structure $V_{p,\tau}^\ell(\mathfrak{g})$ is substantially different from that of affine vertex algebras. We realize $V_{p,\tau}^\ell(\mathfrak{g})$ as a deformation of a simpler quantum vertex algebra $V_{p,\varepsilon}^\ell(\mathfrak{g})$ by using vertex bialgebras, and decompose $V_{p,\varepsilon}^\ell(\mathfrak{g})$ into a Heisenberg vertex algebra and a more interesting quantum vertex algebra determined by a quiver.

Speaker: Ching Hung Lam 林正洪 (Academia Sinica)

Title: Extra automorphisms of cyclic orbifolds of lattice VOAs

Abstract: Let V be a vertex operator algebra and let g be an automorphism of V of finite order n . The fixed-point subspace $V^g = \{v \in V | gv = v\}$ is a subVOA and is often called an orbifold subVOA. It is clear that the orbifold VOA V^g is preserved by $N_{\text{Aut}(V)}(\langle g \rangle)$, where $N_{\text{Aut}(V)}(\langle g \rangle)$ is the normalizer of $\langle g \rangle$ in $\text{Aut}(V)$. An automorphism $\phi \in \text{Aut}(V)$ is called an extra automorphism if ϕ is not induced from an automorphism of V . In this talk, we will discuss some necessary and sufficient conditions for the existence of extra automorphisms for cyclic orbifolds of lattice VOAs.

Speaker: Haisheng Li 李海生 (Rutgers University at Camden)

Title: Deformation construction of quantum vertex algebras

Abstract: There is a conceptual construction of ($\hbar$ -adic) quantum vertex algebras and their modules by using what is called an $\mathcal{S}$ -local set of vertex operators. In this talk, we present a deformation construction of quantum vertex algebras from a vertex algebra with a left module action and a compatible right comodule action of a vertex bialgebra. Applying this very deformation construction to the lattice vertex algebras V_L , we obtain a family of ($\hbar$ -adic) quantum vertex algebras $V_L[[\hbar]]^\eta$. Furthermore, taking L to be a root lattice of type A , D , or E , and by choosing a particular parameter η , we obtain an $\hbar$ -adic quantum vertex algebra $V_L[[\hbar]]^\eta$ and we prove that any $V_L[[\hbar]]^\eta$ -module, in particular the adjoint module itself, is naturally a module for the corresponding double Yangian of level 1. This talk is based on a joint work with Jing-Kong-Tan and a joint work with Fei Kong.

Speaker: Zhengwei Liu 刘正伟 (Tsinghua University)

Title: Functional Integral Construction of Topological Quantum Field Theory

Abstract: We provide an topological analogue of the Osterwalder-Schrader construction on n -dimensional lattice models for any n . From the higher representation theory of higher operator algebras, an unitary n -category will be an emergent symmetry describing the interactions of defects. Then we construct an $n+1$ alterfold topological quantum field theory (TQFT) to characterize the bulk-boundary theory with space-time boundary and defects. This framework unifies a large amount of concepts and remarkable results in TQFT, subfactor theory, quantum information, topological orders, category theory. Several fundamental questions are solved. More will be proposed.

Speaker: Siu-Hung Ng 吴少雄 (Louisiana State University)

Title: Automorphisms of condensable algebras

Abstract: A condensable algebra in the category of representations of a nice VOA is also a VOA. We extend the study of automorphisms of a VOA to those of a condensable algebra A in a modular tensor category $\mathcal{C}$. In this general setting we obtain some significant properties of the automorphism group G of any condensable algebra. This group G can be recovered completely from the A -module category of in $\mathcal{C}$. This talk is based on some recently joint work with Chongying Dong, Li Ren and Feng Xu.

Speaker: David Ridout (University of Melbourne)

Title: Bosonic ghost correlation functions

Abstract: There has been a lot of recent progress on the representation theories of “logarithmic” vertex operator algebras, but not so much around their correlation functions. Here, I report on some work in this direction with Xueting Li and Damodar Rajbhandari. Specifically, we study correlators of the bosonic ghost system as one of the simplest non-rational conformal field theories.

Speaker: Nils R. Scheithauer (Technische Universität Darmstadt)

Title: Vertex algebras and automorphic forms on orthogonal groups

Abstract: We associate to a holomorphic vertex operator algebra of central charge 24 an automorphic form for an orthogonal group and explain how this correspondence can be used to classify such vertex algebras.

Speaker: Bailin Song 宋百林 (University of Science and Technology of China)

Title: Zhu's algebras and C_2 -algebras of classically free vertex operators algebras

Abstract: We prove that, for a classically free vertex algebra, the C_2 -algebra is naturally isomorphic to the associated graded algebra of the Zhu's algebra. As an application, we show that non-trivial holomorphic VOAs of CFT type are not classically free. This includes the affine vertex operator algebra of E_8 at level one, as well as the Moonshine VOA. This is a joint work with Xianlong Zeng.

Speaker: Kaiwen Sun 孙凯文 (University of Science and Technology of China)

Title: VOA and Magic Triangle

Abstract: The magic triangle of Cvitanović and Deligne–Gross extends the Freudenthal–Tits magic square of semisimple Lie algebras and provides a two-dimensional generalization of the Cvitanović–Deligne exceptional series. In this talk, I will discuss several families of rational affine VOAs, W-algebras, and quasi-lisse VOAs naturally associated with the magic triangle. These VOAs exhibit striking universal features including uniform structures in their representation theory, modular properties and character formulae.

Speaker: Haowu Wang 王好武 (Wuhan University)

Title: Singular automorphic products and BKM Lie algebras

Abstract: In 1992, Borcherds proved the monstrous moonshine conjecture by constructing a specific BKM algebra and identifying its denominator function with an automorphic product of singular weight. In this talk, I will present a classification of singular automorphic products and elucidate their relationship to BKM Lie algebras and vertex algebras. To this end, we prove that every singular automorphic product on certain lattices gives rise to a finite-dimensional semi-simple Lie superalgebra structure, and we obtain a complete list of 85 such structures. This talk is based on joint work with K. Sun and B. Williams.

Speaker: Yilong Wang 王亦龙 (Yanqi Lake Beijing Institute of Mathematical Sciences and Applications)

Title: Modular fusion categories with trivial Torelli group actions

Abstract: In this talk, we will review the definition of the mapping class group representations associated to modular fusion categories, and explain some classification results inspired by the properties of these representations. The talk is based on joint work with Liang Chang and Siu-Hung Ng.

Speaker: Yukun Xiao 肖毓琨 (Qingdao University)

Title: Sub-structure in module categories of several vertex operator algebras

Abstract: In this talk, I will show our results on determining sub-MTC and premodular subcategory in module categories of Virasoro VOAs of the unitary series and affine VOAs of types A and C. This is collaborative work with Qirui Fang, Yu Teng and Wen Zheng.

Speaker: Wenbin Yan 颜文斌 (Tsinghua University)

Title: CY singularities and VOAs

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.

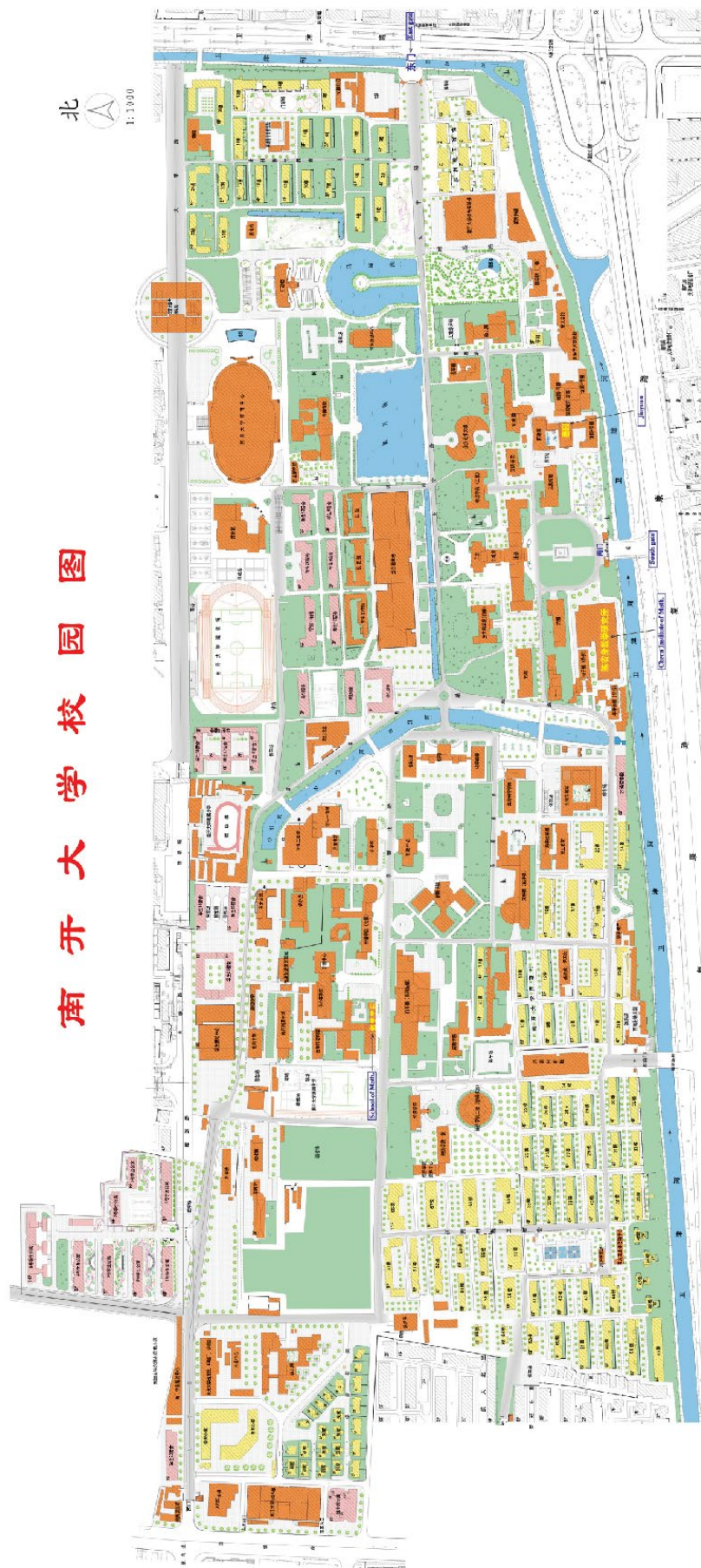
Speaker: Kaiming Zhao 赵开明 (Wilfrid Laurier University)

Title: Representations of the differential operator superalgebra

Abstract: In this talk I will give a classification of all simple quasi-finite weight modules over the Lie superalgebra of differential operators on the super circle $S^{(1,1)}$. We obtain that any simple quasi-finite weight module over the differential operator superalgebra is a highest weight module, a lowest weight module, or a module of the intermediate series. This is based on a joint paper with Dong Liu and Yun Gao.

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