Dr. **Hongjia Chen**

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University of Science and Technology of China
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Education

- 2008 Ph.D. School of Mathematical Sciences, University of Science and Technology of China
  Thesis: Some Root Graded Lie Algebras and their Representations
  (advisor: Professor Yun Gao)
- 2003 Sc.B. Department of Mathematics, University of Science and Technology of China

Academic Experience

- Professor at School of Mathematical Sciences, University of Science and Technology of China
- Visiting at Department of Mathematics, Wilfrid Laurier University
- Postdoctoral Fellow under the supervisions of professors Nicolas Guay and Arturo Pianzola at Department of Mathematical and Statistical Sciences, University of Alberta, July 2009-June 2011
- Postdoctoral Fellow under the supervision of professor Yun Gao at Department of Mathematics and Statistics, York University, September 2008-August 2009
- Research and Teaching Assistants at Department of Mathematics, University of Science and Technology of China, September 2003-July 2008

Research Interests

- Kac-Moody Lie algebras, extended affine Lie algebras, toroidal Lie algebras
- Representation theory, quantum groups, Yangians, vertex operator algebras
- Some other infinite-dimensional Lie algebras: Witt algebra, Virasoro algebra and so on
- Lie algebras and superalgebras associated with left-symmetric algebraic structures

Publications and Preprints

1. Y. Cai, **H. Chen**, X. Guo, Y. Ma and M. Zhu, A class of non-weight modules of $U_q(\mathfrak{sl}_2)$ and Clebsch-Gordan type formulas, **Forum Mathematicum**, 33 (2021) 743–755.
2. Y. Wang, **H. Chen** and Y. Gao, A family of representations of the affine Lie superalgebra $\widehat{\mathfrak{gl}_{m|n}}(\mathbb{C})$, **Journal of Algebra** 492 (2017) 371–392.

3. **H. Chen** and X. Guo, Non-weight modules over the Heisenberg-Virasoro algebra and the W algebra $W(2,2)$, **Journal of Algebra and Its Applications** 16 (2017) 1750097 16pp.
4. **H. Chen** and X. Guo, A new family of modules over the Virasoro algebra, **Journal of Algebra** 457 (2016) 73–105.
5. Q. Wang, **H. Chen** and W. Liu, On representations of the filiform Lie superalgebra $L_{m,n}$, **Journal of Geometry and Physics** 97 (2015) 93–104.
6. **H. Chen** and J. Sun, Universal central extensions of $\mathfrak{sl}_{m|n}$ over $\mathbb{Z}/2\mathbb{Z}$-graded algebras, **Journal of Pure and Applied Algebra** 219 (2015) 4278–4294.
7. **H. Chen**, X. Guo and K. Zhao, Irreducible Harish-Chandra modules over a class of Lie algebras of Block type, **The Asian Journal of Mathematics** 18 (2014) 817–828.
8. **H. Chen**, N. Guay and X. Ma, Twisted Yangians, twisted quantum loop algebras and affine Hecke algebras of type BC, **Transactions of the American Mathematical Society** 366 (2014) 2517–2574.
9. **H. Chen** and J. Li, Left-symmetric algebra structures on the twisted Heisenberg-Virasoro algebra, **Science in China Series A: Mathematics** 57 (2014) 469–476.
10. **H. Chen**, X. Guo and K. Zhao, Tensor product weight modules over the Virasoro algebra, **Journal of the London Mathematical Society** 88 (2013) 829–844.
11. **H. Chen** and X. Guo, New simple modules for the Heisenberg-Virasoro algebra, **Journal of Algebra** 390 (2013) 77–86.
12. S. Bhargava, **H. Chen** and Y. Gao, A family of representations of the Lie superalgebra $\widehat{\mathfrak{gl}_{1|l-1}}(\mathbb{C}_q)$, **Journal of Algebra** 386 (2013) 61–76.
13. **H. Chen** and X. Guo, Unitary Harish-Chandra modules over Block type Lie algebras $\mathcal{B}(q)$, **Journal of Lie Theory** 23 (2013) 827–836.
14. **H. Chen** and N. Guay, Central extensions of matrix Lie superalgebras over $\mathbb{Z}/2\mathbb{Z}$-graded algebras, **Algebras and Representation Theory** 16 (2013) 591–604.
15. **H. Chen** and J. Li, Left-symmetric algebra structures on the W-algebra $W(2,2)$, **Linear Algebra and its Applications** 437 (2012) 1821–1834.
16. **H. Chen** and N. Guay, Twisted affine Lie superalgebra of type Q and quantization of its enveloping superalgebra, **Mathematische Zeitschrift** 272 (2012) 317–347.
17. X. Kong, **H. Chen** and C. Bai, Classification of graded left-symmetric algebraic structures on Witt and Virasoro algebras, **International Journal of Mathematics** 22 (2011) 201-222.
18. **H. Chen**, Y. Gao and S. Shang, Central extensions of Steinberg Lie superalgebras of small rank, **Communications in Algebra** 35 (2007) 4225-4244.
19. **H. Chen** and Y. Gao, BC_N-graded Lie algebras arising from fermionic representations, **Journal of Algebra** 308 (2007) 545-566.
20. **H. Chen**, Y. Gao and S. Shang, B(0,N)-graded Lie superalgebras coordinatized by quantum tori, **Science in China Series A: Mathematics** 49 (2006) 1740-1752.

Working Manuscripts

1. **H. Chen** and L. Wang, A family of simple modules over the Rueda's algebras, submitted.
2. **H. Chen** and L. Wang, Whittaker modules over some generalized Weyl algebras.
3. **H. Chen**, X. Liu and L. Wang, U^0-free quantum group representations.
4. S. Bhargava, **H. Chen** and Y. Gao, Finite dimensional representations of the nullity 2 centreless core $\mathfrak{g}_{2n,\rho}(\mathbb{C}_q)$, arXiv:1906.03453, submitted.
5. **H. Chen** and Q. Chen, Finite dimensional representations of the BC-graded Lie algebra $\mathfrak{g}_{2n+1}(\mathbb{C}_q)$, submitted.

6. **H. Chen** and Z. Wan, A class of representations over the Euclidean Lie algebra $\mathfrak{e}_3$ and the irreducible representations of $\mathfrak{sl}_2(\mathbb{C})$, submitted.
7. **H. Chen** and Q. Wang, Irreducible representation of supersolvable Lie superalgebras.
8. **H. Chen**, W. Liu and Q. Wang, A class of new modular Lie superalgebras and their representations.
9. **H. Chen** and Q. Wang, Invariant rings of Lie superalgebras of Cartan type over fields of characteristic zero.
10. **H. Chen** Q. Wang and J. Zhang, Left-symmetric algebra structures on the Lie algebra $V(0, \frac{p}{q})$.
11. **H. Chen** and Z. Zeng, Irreducible representations of Lie algebras $\mathfrak{gl}_{m|n}(\mathbb{C})$ and $\widehat{\mathfrak{gl}_{m|n}}(\mathbb{C})$.
12. **H. Chen**, Y. Gao and Z. Zeng, Some representations of quantum enveloping superalgebra $U_q(\mathfrak{gl}_{M|N}(\mathbb{C}))$.
13. **H. Chen**, A class of representations over $\mathfrak{sl}_2(\mathbb{C}) \ltimes V(m)$, unpublished note.
14. **H. Chen** and H. He, The q-Virasoro-like algebra and some simple quotients.
15. **H. Chen**, Y. Gao and S. Shi, Imaginary Whittaker modules for a class of extended affine Lie algebras, in preparation.
16. **H. Chen**, Y. Gao and A. Pianzola, Irreducible representations of Lie algebras $\mathfrak{gl}_{m+n}(\mathbb{C})$ and $\widehat{\mathfrak{gl}_{m+n}(\mathbb{C})}$.

Teaching Experience

Professor, University of Science and Technology of China:

- Modern Algebra: Spring 2019.
- L.-K. Hua Seminar (H): Fall 2016 + Spring 2017.
- Modern Algebra (H): Spring 2015.
- Linear Algebra (A1): Spring 2015.
- Topics in Algebra II: Fall 2014.
- Linear Algebra (B2): Falls 2014, 2017, 2019, 2020.
- Representation Theory of Lie Algebras: Fall 2019.
- Lie Algebras and their Representation Theory: Springs 2014, 2016, 2017, 2018, 2019, 2020, 2021.

Postdoctoral instructor, University of Alberta:

- MATH 228 Lec A1: Algebra: Introduction to Ring Theory, Spring 2011.
- MATH 422 Lec Q1: Coding Theory, Winter 2011.
- MATH 582 Lec Q1: Rings and Modules, Winter 2010.
- MATH 681 Lec B1: Topics in Algebra, Fall 2009.

Teaching assistant, University of Science and Technology of China:

- Linear Algebra for Department of Mathematics, Fall 2004, Winter 2007-Fall 2007, Fall 2013.
- Mathematical Analysis for Department of Mathematics, Fall 2003.

Grants and Scholarships

- The Key Program of the National Natural Science Foundation of China: January 2020–December 2024.
- The General Program of the National Natural Science Foundation of China: January 2018–December 2021.
- Fundamental Research Funds for the Central Universities: January 2016–December 2017.
- The Young Scientists Fund of the National Natural Science Foundation of China: January 2015–December 2017.
- University of Science and Technology of China Start-up Grant: March 2014.

Invited Talks

- Soochow University, Seminar, June 26, 2021, A family of modules over the Rueda's algebras. **(Online)**
- HeFei University of Technology, Seminar, April 18, 2021, $U(\mathfrak{h})$-free modules over $\mathfrak{sl}_2(\mathbb{C})$ and the tensor products. **(Online)**
- Changshu Institute of Technology, Seminar, Jan. 12, 2021, R^0-free modules of rank 1 over the Rueda's algebras. **(Online)**
- HeFei University of Technology, Seminar, Jan. 7, 2021, A family of modules over the Rueda's algebras.
- Shanghai University, Seminar, Dec. 5, 2020, $U(\mathfrak{h})$-free modules over $\mathfrak{sl}_2(\mathbb{C})$ and the tensor products. **(Online)**
- Wuhan University, Seminar, Nov. 19, 2020, Tensor products modules of $U_q(\mathfrak{sl}_2)$ and Clebsch-Gordan type formulas. **(Online)**
- China University of Mining and Technology, Seminar, Oct. 20, 2020, Tensor products of $\mathbb{C}[K^{\pm 1}]$-free modules for $U_q(\mathfrak{sl}_2)$. **(Online)**
- Central China Normal University, Workshop, Oct. 18, 2020, A family of modules over the Rueda's algebras. **(Online)**
- Shanghai Maritime University, Seminar, Sep. 26, 2020, Tensor products of $\mathbb{C}[K^{\pm 1}]$-free modules for $U_q(\mathfrak{sl}_2)$. **(Online)**
- Beijing Normal University, Workshop, Sep. 19, 2020, Tensor products of $\mathbb{C}[K^{\pm 1}]$-free modules for $U_q(\mathfrak{sl}_2)$. **(Online)**
- Jilin University, Seminar, June 4, 2020, $U(\mathfrak{h})$-free modules over Lie algebras. **(Online)**
- Northeast Normal University, Seminar, May 24, 2020, On representations of the filiform Lie superalgebra $L_{m,n}$. **(Online)**
- Lanzhou University, Seminar, Oct. 18, 2019, A family of modules over quantum groups I: A_1c case.
- Jilin University, Mini-Workshop, May 25, 2019, Free fields and Lie superalgebras of type A.

- Fudan University, **the Joint International Meeting of CMS-AMS**, June 14, 2018, A family of modules over quantum groups I: A_1 case.
- Shanghai University, Seminar, May 23, 2018, Graded left-symmetric algebraic structures on Witt and Virasoro algebras.
- Yangzhou University, Workshop on Representation Theory and Tensor Categories, January 23, 2018, Module structures on $\mathbb{C}[K^{\pm 1}]$ for $U_q(\mathfrak{sl}_2)$.
- Huzhou University, Seminar, December 16, 2017, Imaginary Whittaker modules for a class of extended affine Lie algebras.
- Shanghai University, **Workshop on Quantum Algebra and Representation**, December 13, 2017, Module structures on $\mathbb{C}[K^{\pm 1}]$ for $U_q(\mathfrak{sl}_2)$.
- Suzhou University of Science and Technology, Seminar, November 2, 2017, Simple Lie algebra $\mathfrak{sl}_2$ and a class of modules over the Euclidean Lie algebra $\mathfrak{e}_3$.
- Shanghai Maritime University, Seminar, October 20, 2017, Finite dimensional representations of $\mathfrak{g}_{2n,\rho}(\mathbb{C}_q)$.
- East China Normal University, Seminar, October 19, 2017, Imaginary Whittaker modules for a class of extended affine Lie algebras.
- Northeast Normal University, Seminar, October 7, 2017, Graded left-symmetric algebraic structures on Witt and Virasoro algebras.
- Heilongjiang University, Seminar, September 30, 2017, Universal central extensions of $\mathfrak{sl}_{m|n}$ over $\mathbb{Z}/2\mathbb{Z}$-graded algebras.
- Harbin Engineering University, Seminar, September 29, 2017, Some irreducible modules over the W-algebra $W(2,2)$ and the Virasoro algebra.
- Nankai University, Workshop on Lie Theory, September 16, 2017, Graded left-symmetric algebraic structures on Witt and Virasoro algebras.
- Changshu Institute of Technology, Seminar, August 7, 2017, Simple Lie algebra $\mathfrak{sl}_2$ and a class of modules over the Euclidean Lie algebra $\mathfrak{e}_3$.
- Soochow University, Seminar, August 6, 2017, Universal central extensions of $\mathfrak{sl}_{m|n}$ over $\mathbb{Z}/2\mathbb{Z}$-graded algebras.
- Qingdao University, **the 4th VOA Annual Meeting**, May 14, 2017, Tensor product modules of the Virasoro algebra and the intertwining operators.
- Shandong Normal University, **International Conference on Lie Theory and its Applications**, May 1, 2017, A family of modules over the Virasoro algebra and the W-algebra $W(2,2)$.
- Henan University, Seminar, July 8, 2016, Tensor product weight modules over the Virasoro algebra.
- Zhengzhou University, Seminar, July 6, 2016, Some root graded Lie algebras and their representations.
- Xinyang Normal University, **International Conference on Lie Algebra**, June 4, 2016, Finite dimensional representations of $\mathfrak{g}_{2n,\rho}(\mathbb{C}_q)$.

- Hunan University, Seminar, May 19, 2016, Tensor product weight modules over the Virasoro algebra.
- Liaoning University, Seminar, May 12, 2016, Simple Lie algebra $\mathfrak{sl}_2$ and a class of modules over the Euclidean Lie algebra $\mathfrak{e}_3$.
- Northeast Normal University, Seminar, May 5, 2016, Some root graded Lie algebras and their representations..
- Jilin University, Seminar, May 5, 2016, Simple Lie algebra $\mathfrak{sl}_2$ and a class of modules over the Euclidean Lie algebra $\mathfrak{e}_3$.
- Jiangsu Normal University, Seminar, April 26, 2016, Finite dimensional representations of $\mathfrak{g}_{2n,\rho}(\mathbb{C}_q)$.
- Northeast Normal University, Seminar, December 30, 2015, Tensor product weight modules over the Virasoro algebra.
- Xiamen University, Seminar, December 3, 2015, Tensor product weight modules over the Virasoro algebra.
- South China University of Technology, Seminar, November 26, 2015, Tensor product weight modules over the Virasoro algebra.
- Anhui University, **The 3rd Yangtze River Delta Conference on Algebra**, November, 1, 2015, Finite dimensional representations of $\mathfrak{g}_{2n,\rho}(\mathbb{C}_q)$.
- **The 14th National Conference on Lie Algebra**, Xinyang, July 24, 2015, Coideal subalgebras of quantum groups.
- University of Science and Technology of China, GAP Seminar, April 7, 2015, Introduction to Lie algebras and their representations.
- Jianghan University, **International Conference on Random Matrices and Representation Theory**, December 18, 2014, Tensor product weight modules over the Virasoro algebra.
- Shanghai University, Seminar, December 5, 2014, Modules over the Heisenberg-Virasoro and $W(2,2)$ algebras.
- Tongji University, Seminar, December 4, 2014, Modules over the Heisenberg-Virasoro and $W(2,2)$ algebras.
- Wilfrid Laurier University, Seminar, July 10, 2014, Modules over the Heisenberg-Virasoro and $W(2,2)$ algebras.
- Shanghai Normal University, Seminar, November 25, 2013, Tensor product weight modules over the Virasoro algebra.
- Harbin Normal University, Seminar, March 13, 2013, Tensor product weight modules over the Virasoro algebra.
- University of Science and Technology of China, Seminar, March 8, 2013, Tensor product weight modules over the Virasoro algebra.
- Changshu Institute of Technology, Seminar, March 2, 2013, Tensor product weight modules over the Virasoro algebra.

Conferences Attended

- (**Upcoming**) The 17th National Conference on Lie Theory, Harbin Normal University, July 25-31, 2021.
- The 15th National Conference on Algebra, Nanning, Guangxi, July 21-26, 2019.
- The 16th National Conference on Lie Algebra, Qingdao University, July 13-20, 2019.
- International Conference on Representation Theory VIII, Harbin Engineering University, July 8-12, 2019.
- Lie Theory and Representation Theory, Tongji University, June 30-July 3, 2018.
- The 15th National Conference on Lie Algebra, Northeast Normal University, July 23-29, 2017.
- The 7th International Conference on Representation Theory, Huaqiao University, July 18-23, 2016.
- The 14th National Conference on Algebra, Yangzhou University, May 26-31, 2016.
- The Changshu Conference on Lie Algebra, Changshu Institute of Technology, April 23-25, 2016.
- The 3rd VOA Annual Meeting, Shanghai Normal University, March 26-28, 2016.
- Workshop on Algebra and Representation Theory, Beijing Normal University, June 14-15, 2014.
- CRM-Fields Workshop on Infinite dimensional Lie theory: algebra, geometry and combinatorics, CRM Montreal, August 21-24, 2012.
- Workshop on Algebraic Monoids, Group Embeddings and Algebraic Combinatorics, Fields Institute, July 3-6, 2012.
- Workshop on Category Theoretic Methods in Representation Theory, University of Ottawa, October 14-16, 2011.
- Affine Schubert Calculus Workshop and Summer School, University of Toronto and Fields Institute, July 7-15, 2010.
- Summer School and Conference in Geometric Representation Theory and Extended Affine Lie Algebras, University of Ottawa, June 15-July 3, 2009.
- The 10th National Conference on Lie Algebra, Changshu Institute of Technology, August 10-16, 2007.
- Workshop on Lie Theory, University of Science and Technology of China, June 2007.
- The 10th National Conference on Algebra, Xiamen University, October 2006.
- Workshop and Summer School on Lie Theory and Representation Theory, East China Normal University, July 10-30, 2006.
- Workshop on Infinite-dimensional Lie Algebras, Vertex Operator Algebras and Related Topics, Chern Institute of Mathematics, Nankai University, May 29-June 9, 2006.
- The 9th National Conference on Lie Algebra, Harbin Normal University, July 11-15, 2005.
- Workshop on Non-associative Algebras, Chern Institute of Mathematics, Nankai University, June 10-11, 2005.

- Workshop on Vertex Operator Algebras and Conformal Field Theory, University of Science and Technology of China Shanghai Institute for Advanced Studies, December 2004.
- The 9th National Conference on Algebra, University of Science and Technology of China, Mountain Huang, October 9-15, 2004.
- The 3rd International Conference on Representation Theory, Sichuan University, Chengdu, July 30-August 4, 2004.
- International Conference in Memory of Armand Borel, Center of Mathematical Sciences, Zhejiang University, Hangzhou, July 26-30, 2004.
- International Conference on Infinite-dimensional Lie Theory (Dedicated to Stephen Berman), Morningside Center of Mathematics, Chinese Academy of Sciences, Beijing, July 19-23, 2004.
- Workshop on Lie Groups and Automorphic Forms, Center of Mathematical Sciences, Zhejiang University, Hangzhou, August 2003.

Service to the Scientific Community

- Referee for Communications in Acta Mathematica Sinica, Algebra Colloquium, Bulletin of the Iranian Mathematical Society, Frontiers of Mathematics in China, Journal of Algebra and its Applications, Linear Algebra and its Applications, Mathematics and Statistics, Mediterranean Journal of Mathematics, SCIENCE CHINA Mathematics, SIGMA, etc.
- Referee for NSFC.

Language

Chinese, English