Kang Lu

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Experience

08/2022 – Present **Research Associate and Lecturer**, *University of Virginia*.
Mentor: Weiqiang Wang

09/2020 – 07/2022 **Visiting Assistant Professor**, *University of Denver*.
Mentor: Andrew Linshaw

Education

2014 – 2020 **Ph.D. in Math**, *Indiana University Purdue University Indianapolis*.
Advisor: Evgeny Mukhin & Vitaly Tarasov

2012 – 2014 **M.S. in Mathematics**, *Zhejiang University*.
Advisor: Gang Han

2006 – 2010 **B.S. in Mathematics**, *Fudan University*.
Advisor: Meng Chen

Research Interests

- Representation Theory
- Mathematical Physics
- Quantum Algebras
- Integrable Systems

Preprints

2. Kang Lu, W. Wang, W. Zhang, *A Drinfeld presentation of twisted Yangians*, in preparation.
1. Kang Lu, *Representations of twisted super Yangians of type AIII*, in preparation.

Publications

15. Kang Lu, *On Bethe eigenvectors and higher transfer matrices for supersymmetric spin chains*, J. High Energ. Phys. **04** (2023), Article number: 120.
14. Kang Lu, *Schur-Weyl duality for quantum toroidal superalgebras*, J. Pure Appl. Algebra **227** (2023), no. 9, 107382.
13. Kang Lu, *Completeness of Bethe ansatz for Gaudin models associated with* $\mathfrak{gl}(1|1)$, Nuclear Phys. B **980** (2022), 115790.
12. Kang Lu, *A note on odd reflections of super Yangian and Bethe ansatz*, Lett. Math. Phys. **112** (2022), Article no.: 29.
11. Kang Lu, *Gelfand-Tsetlin bases for representations of super Yangian and quantum affine superalgebra*, Lett. Math. Phys. **111** (2021), Article no.: 145.
10. Kang Lu, E. Mukhin, *Bethe ansatz equations for orthosymplectic Lie superalgebras and self-dual superspaces*, Ann. Henri Poincaré **22** (2021), no. 12, 4087–4130.
9. Kang Lu, E. Mukhin, *Jacobi-Trudi identity and Drinfeld functor for super Yangian*, Int. Math. Res. Not. IMRN **2021** (2021), no. 21, 16749-16808.

8. Kang Lu, E. Mukhin, *On the supersymmetric XXX spin chains associated to* $\mathfrak{gl}_{1|1}$, Commun. Math. Phys. **386** (2021), 711-747.

7. Kang Lu, *Perfect integrability and Gaudin models*, SIGMA **16** (2020), 132, 10 pages.

6. C. Huang, Kang Lu, and E. Mukhin, *Solutions of* $\mathfrak{gl}_{m|n}$ *XXX Bethe ansatz equation and rational difference operators*, J. Phys. A: Math. Theor. **52** (2019), no. 37, 375204, 31 pages.

5. Kang Lu, E. Mukhin, *On the Gaudin model of type* G_2, Commun. Contemp. Math. **21** (2019), no. 3, 1850012, 31 pages.

4. G. Han, Y. Liu, and Kang Lu. *Multiplicity free gradings on semisimple Lie and Jordan algebras and skew root systems*, Algebra Colloq. **26** (2019), no. 1, 123–138.

3. Kang Lu, *Lower bounds for numbers of real self-dual spaces in problems of Schubert calculus*, SIGMA **14** (2018), 046, 15 pages.

2. Kang Lu, E. Mukhin, and A. Varchenko. *Self-dual Grassmannian, Wronski map, and representations of* $\mathfrak{gl}_N$, $\mathfrak{sp}_{2r}$, $\mathfrak{so}_{2r+1}$, Pure Appl. Math. Q. **13** (2017), no.2, 291–335, special issue in honor of Yuri Manin's 80-th birthday.

1. Kang Lu, E. Mukhin, and A. Varchenko. *On the Gaudin model associated to Lie algebras of classical types*, J. Math. Phys. **57** (2016), no. 10, 101703, 23 pages.

Conference Presentations

May 12-14, 2023 **13th Southeastern Lie Theory Workshop**, *Combinatorial Representation Theory of Algebras and Applications*, North Carolina State University, Raleigh, NC.
Talk: A Drinfeld presentation of twisted Yangians

April 15-16, 2023 **2023 AMS Spring Central Sectional Meeting**, *Special Session on Representation Theory, Geometry and Mathematical Physics*, University of Cincinnati, OH.
Talk: Representations of Twisted super Yangians of type AIII

March 13-14, 2021 **2021 AMS Spring Southeastern Sectional Meeting**, *Special Session on Superalgebras, Quantum Groups, and Related Topics*.
Talk: Skew representations of super Yangian

January 15-18, 2020 **Joint Mathematics Meetings 2020**, *Colorado Convention Center*, Denver, CO.
Talk: On the supersymmetric XXX spin chains

August 12-16, 2019 **Representation Theory and Integrable Systems**, *ETHZ*, Zurich, Switzerland.
Talk: On the supersymmetric XXX spin chain associated to $\mathfrak{gl}_{1|1}$

April 13-14, 2019 **2019 AMS Spring Eastern Sectional Meeting**, *University of Connecticut*, Hartford, CT.
Talk: On the supersymmetric XXX spin chain associated to $\mathfrak{gl}_{1|1}$

March 15-17, 2019 **2019 AMS Spring Southeastern Sectional Meeting**, *Auburn University*, Auburn, AL.
Talk: Self-dual Grassmannian and Representations of $\mathfrak{gl}_N$, $\mathfrak{sp}_{2r}$, and $\mathfrak{so}_{2r+1}$

May 29-June 2, 2017 **Representation Theory at the Crossroads of Modern Mathematics**, *Université de Reims Champagne Ardenne*, Reims, France.
Poster: Self-dual Grassmannian and Representations of $\mathfrak{gl}_N$, $\mathfrak{sp}_{2r}$, and $\mathfrak{so}_{2r+1}$

April 1-2, 2017 **2017 AMS Spring Central Sectional Meeting**, *Indiana University*, Bloomington, IN.
Talk: Bethe ansatz method in Gaudin Model

Seminar Talks

04/26/2023 **Algebra Seminar**, *University of Virginia*, Charlottesville, VA.
Talk: A Drinfeld presentation of twisted Yangians

11/19/2021 **NCTS Seminar on Representation Theory**, *Taiwan*, Zoom.
Talk: Representations of Super Yangian

03/11/2021 **Rocky Mountain Representation Theory Seminar**, *Zoom*.
Talk: Skew representations of super Yangian

02/17/2021 **Representations and Lie Theory seminar**, *Ohio State University*, Zoom.
Talk: Skew representations of super Yangian

10/19/2020 **Algebra and Logic Seminar**, *University of Denver*, Denver, CO.
Talk: Gaudin model, Feigin-Frenkel center, and Grassmannian

11/15/2019 **Algebra Seminar**, *University of Virginia*, Charlottesville, VA.
Talk: Jacobi-Trudi identity, Berezinian, and transfer matrices

10/04/2019 **Physically inspired mathematics seminar**, *University of North Carolina*, Chapel Hill, NC.
Talk: Supersymmetric quantum spin chains

Conferences Attended

June 4-8, 2018 **Representation Theory, Mathematical Physics and Integrable Systems**, *Centre International de Rencontres Mathématiques*, Luminy, France.

June 6-9, 2017 **Algebraic Analysis**, *IHÉS*, Bures-sur-Yvette, France.

April 30, 2016 **Algebra, Geometry and Combinatorics Day**, *University of Notre Dame*, Notre Dame, IN.

August 14-18, 2015 **Lie Algebras, Vertex Operator Algebras, and Related Topics**, *University of Notre Dame*, Notre Dame, IN.

Teaching

University of Virginia

2024 Spring MATH 3351: Elementary Linear Algebra
2023 Fall MATH 3354: Survey of Algebra
2023 Spring MATH 3351: Elementary Linear Algebra
2022 Fall MATH 3310: Basic Real Analysis

University of Denver

2022 Summer MATH 1952: Calculus II
2022 Spring MATH 2070: Introduction to Differential Equations
2022 Spring MATH 2080: Calculus of Several Variables
2022 Winter MATH 1951: Calculus I
2022 Winter MATH 1150: Mathematics for Cryptography
2021 Autumn MATH 1951: Calculus I
2020 Spring MATH 1952: Calculus II
2020 Winter MATH 1150: Introduction to Cryptography
2020 Winter MATH 2070: Introduction to Differential Equations
2020 Autumn MATH 1951: Calculus I

Indiana University Purdue University Indianapolis

2020 Summer MATH 16500: Calculus and Analytic Geometry I
2020 Spring MATH 22100: Calculus for Technology I
2019 Fall MATH 15400: Trigonometry
2019 Summer MATH 26600: Ordinary Differential Equations
2019 Spring MATH 22100: Calculus for Technology I

2018 Fall	MATH 11100: Intermediate algebra
2018 Summer	MATH 15400: Trigonometry
2018 Spring	MATH 11000: Fundamentals of Algebra
2017 Fall	MATH 16500: Calculus and Analytic Geometry I, (Recitation)

Referee Services

- Algebras and Representation Theory
- Arnold Mathematical Journal
- Communications in Mathematical Physics (×2)
- Compositio Mathematica
- Journal of Algebra
- Journal of Mathematical Physics (×2)
- Journal de l'École polytechnique - Mathématiques
- Letters in Mathematical Physics
- SciPost Physics
- SIGMA (×2)
- Transformation Groups (×2)

References

- Andrew Linshaw, Department of Mathematics, University of Denver, Andrew.Linshaw@du.edu
- Evgeny Mukhin, Department of Mathematical Science, Indiana University Purdue University Indianapolis, emukhin@iupui.edu
- Vitaly Tarasov, Department of Mathematical Science, Indiana University Purdue University Indianapolis, vtarasov@iupui.edu
- Alexander Varchenko, Department of Mathematics, University of North Carolina at Chapel Hill, anv@email.unc.edu