Li Lai

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Work Experience

2023–Present **Peking University**, Beijing International Center for Mathematical Research.
Postdoc, Mentor: Liang Xiao

2020–2021 **Fudan University**, School of Mathematical Sciences.
Research Assistant, Mentor: Yijun Yao

Education

2021–2023 **Tsinghua University**, Beijing, China.
Ph.D. Mathematics, Advisor: Pin Yu

2014–2020 **Tsinghua University**, Yau Mathematical Sciences Center, Beijing, China.
M.S. Mathematics, Advisor: Pin Yu

2010–2014 **Tsinghua University**, Beijing, China.
B.S. Mathematics

Research Interests

I mainly work on transcendental number theory. I am interested especially in odd zeta values $\zeta(2k+1)$, p-adic zeta values $\zeta_p(2k+1)$ and multiple zeta values $\zeta(k_1, k_2, \ldots, k_r)$.

Publications

5. Li Lai,
On the irrationality of certain 2-adic zeta values,
Int. J. Number Theory 21 (2025), no. 1, 207–235.
arXiv:2304.00816

4. Li Lai, Jiong-Yue Li and Pin Yu,
On the rigidity of stationary charged black holes: small perturbations of the non-extremal Kerr-Newman family,
J. Differential Geom. 125 (2023), no. 3, 553–612.
arXiv:1911.10560

3. Steven Charlton, Herbert Gangl, Li Lai, Ce Xu and Jianqiang Zhao,
On two conjectures of Sun concerning Apéry-like series,
Forum Math. 35 (2023), no. 6, 1533–1547.
arXiv:2210.14704

2. Li Lai and Li Zhou,
At least two of $\zeta(5), \zeta(7), \ldots, \zeta(35)$ are irrational,
Publ. Math. Debrecen 101/3–4 (2022), 353–372.
arXiv:2103.00904

1. Li Lai and Pin Yu,
A note on the number of irrational odd zeta values,
Compos. Math. 156 (2020), no. 8, 1699–1717.
arXiv:1911.08458

Preprints

6. Li Lai, Johannes Sprang and Wadim Zudilin,
   A note on the irrationality of $\zeta_2(5)$,
   arXiv:2505.05005

5. Li Lai,
   A note on the number of irrational odd zeta values, II,
   arXiv:2501.05321

4. Li Lai,
   Small improvements on the Ball-Rivoal theorem and its p*-adic variant*,
   arXiv:2407.14236v2

3. Li Lai and Johannes Sprang,
   Many p*-adic odd zeta values are irrational*,
   to appear in Michigan Math. J.,
   arXiv:2306.10393

2. Li Lai, Cezar Lupu and Derek Orr,
   Elementary proofs of Zagier's formula for multiple zeta values and its odd variant,
   to appear in Proc. Amer. Math. Soc.,
   arXiv:2201.09262

1. Li Lai,
   On the largest prime divisor of $n! + 1$,
   arXiv:2103.14894

Awards and Honors

2010 51^{st} International Mathematical Olympiad: Gold Medal

Teaching

Fall 2024 Rational Functions and the Irrationality of Odd Zeta Values, Mini Course, Peking University

Spring 2024 Advanced Mathematics B (2), Peking University

Spring 2021 Rational Functions and the Irrationality of Odd Zeta Values, Short Course, Fudan University

Seminar (Co)Organized

Fall 2021–Spring 2022 Tsinghua-BIMSA Learning Seminar on Multiple Zeta Values, Tsinghua University

Talks

September 7, 2024 Southeast University

A slight improvement on the Ball-Rivoal theorem

February 16, 2024 — The 17th Young Mathematicians Conference on Zeta Functions

At least two of $\zeta(5), \zeta(7), \ldots, \zeta(35)$ are irrational

August 5, 2023 — Zhejiang Sci-Tech University

Many p-adic odd zeta values are irrational

May 27, 2023 — Anhui Normal University

On the irrationality of certain 2-adic zeta values

April 5, 2023 — BICMR Number Theory Seminar

On the irrationality of certain 2-adic zeta values

January 9, 2023 — East Asia Core Doctoral Forum in Mathematics (Online)

At least two of $\zeta(5), \zeta(7), \ldots, \zeta(35)$ are irrational

August 8, 2022 — Conference on MZVs and Related Topics (Online)

Linear forms in Riemann zeta values and MZVs

July 12, 2022 — BIMSA-YMSC Tsinghua Number Theory Seminar (Online)

Elementary proofs of Zagier's formula for multiple zeta values and its odd variant

March 21, 2022 — Jiangxi Normal University

At least two of $\zeta(5), \zeta(7), \ldots, \zeta(35)$ are irrational

March 12, 2022 — Anhui Normal University

Elementary proofs of Zagier's formula for multiple zeta values and its odd variant

January 7, 2022 — Learning Seminar on Multiple Zeta Values, YMSC&BIMSA

Linear forms in Riemann zeta values and MZVs

June 27, 2020 — Webinar on APDE (Online)

Recent progress on the irrationality of $\zeta(2k+1)$.

Other Experiences and Activities

Spring 2013 — Exchange student at École Normale Supérieure, Paris, France