Qihang Sun

Institut des Hautes Études Scientifiques (IHES), France
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Research Interests

Analytic number theory, modular forms, Kloosterman sums, and their applications.
Sphere packing, Fourier interpolation, and their connection to modular forms.

Work Experience

Centre national de la recherche scientifique (CNRS), France

- CNRS Postdoctoral Researcher

  Supervisor: Dr. Danylo Radchenko

Institut des Hautes Études Scientifiques (IHES)	2026/03 – present
Université de Lille	2024/09 – 2026/02

  Member of ERC Starting Grant FourIntExp: *Fourier Interpolation and Extremal Problems*

Education

University of Illinois Urbana-Champaign (UIUC), USA

- PhD (in Mathematics) — 2019/08 – 2024/05

  Advisor: Prof. Dr. Scott Ahlgren

  Thesis: *Half-integral weight Kloosterman sums and integer partitions*

Xi'an Jiaotong University (XJTU), China

- BSc (Honors in Mathematics) — 2015/09 – 2019/06

  Advisor: Prof. Dr. Jia, Junxiong

- Honors Youth Program — 2013/09 – 2015/08

Publications & Preprints

Coauthors are listed in alphabetical order. Unlisted authorship indicates single-authored work.

7. **The basis functions of Fourier interpolation**.
   (joint with D. Berghaus, A. Bondarenko, D. Radchenko, K. Seip)
   submitted. (41 pages) arXiv: 2512.18677

6. **Fourier interpolation in dimensions 3 and 4 and real-variable Kloosterman sums**.
   (joint with D. Radchenko)
   submitted. (52 pages) arXiv: 2510.04873

5. **Vanishing properties of Kloosterman sums and Dyson's conjectures**.
   Ramanujan J. **66**(50), 2025. (54 pages) arXiv: 2406.07469

4. **Exact formulae for ranks of partitions**.
   Trans. Amer. Math. Soc. **379**(3), 2026. (59 pages) arXiv: 2406.06294

3. **Uniform bounds for Kloosterman sums of half-integral weight, same-sign case**.
   J. Number Theory **274**, 2025, pp. 104-139. (36 pages)   arXiv: 2309.05233

2. **Uniform bounds for Kloosterman sums of half-integral weight with applications**.
   Forum Math. **37**(1), 2025, pp. 75-109. (35 pages)   arXiv: 2305.19651

1. **Effective estimates for traces of singular moduli**.
   (joint with O. González)
   Res. Number Theory **10**(29), 2024. (18 pages)   arXiv: 2305.19649

Visits & Talks

Academic visits

- **Morningside Center of Mathematics, Chinese Academy of Sciences, Beijing, China.**
  Visiting student. Host: Prof. Dr. Tian, Ye.   2022/04 – 2022/06

- **Georgia Institute of Technology, Atlanta, USA.**
  Undergraduate Exchange Program.   2018/01 – 2018/05

Invited talks

- Rademacher-type exact formulas for rank of partitions with a new proof of Ramanujan congruences.
  Michigan Technological University, Houghton, USA. *Seminar in Partition Theory, q-Series and Related Topics*.   2026/03/03

- Integer partition, Kloosterman sums, and further applications.
  Hunan University, Changsha, China. *Combinatorics & Number Theory Seminar*. 2025/12/30

- Exact formulae for ranks of partitions.
  Co-organized by Universität Zürich (Switzerland), University College London (UK), University of Wisconsin–Madison (USA), and Technische Universität Darmstadt (Germany). *International Seminar on Automorphic Forms*.   2024/10/29

- Exact formulae for ranks of partitions.
  Universität zu Köln, Germany. *Number Theory Seminar*.   2024/10/07

- Asymptotics in partitions: circle method and Kloosterman sums.
  UIUC, USA. *Number Theory Seminar*.   2023/10/17

- Integer partitions and Kloosterman sums.
  UIUC, USA. *Graduate Number Theory Seminar*.   2023/10/12

- Sums of Kloosterman sums with applications to partitions.
  XJTU, Xi'an, China. *Number Theory Seminar*.   2023/07/21

Conference talks

- Exact formulae for ranks of partitions.
  Centre international de rencontres mathématiques (CIRM), Marseille, France. *Building Bridges: 6th EU/US Summer School & Workshop on Automorphic Forms and Related Topics (BB6). École et Atelier sur les formes automorphes et interactions*.   2024/09/09

- Sums of Kloosterman sums and their applications.
  École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. *Workshop on Arithmetic Statistics in Automorphic Forms and Analytic Number Theory*.   2023/06/08

- Uniform bounds on sums of Kloosterman sums and the applications to partitions.
  Louisiana State University, USA. *35th Automorphic Forms Workshop*.   2023/05/24

- Uniform bounds on sums of Kloosterman sums and their application on partitions.
  Technische Universität Darmstadt, Germany. *Early Number Theory Researchers Workshop*.
                                                                          2022/10/28

Speed / Lightning talks

- Fourier interpolation and continuous Kloosterman sums.
  Max-Planck-Institut für Mathematik, Bonn, Germany. *Conference on "Progress and Emergent Theories in Zeta and L-Functions" (PRETZL)*.   2025/07/22

- Exact formulas for rank of partitions.
  Universität zu Köln, Germany. *International Conference on Modular Forms and q-Series*.
                                                                          2024/03/12

- Exact formulas for rank of partitions.
  Tulane University, New Orleans, USA. *Annual Clifford Lectures*.   2024/02/25

- Uniform bounds on sums of Kloosterman sums analogue to Goldfeld and Sarnak.
  Max-Planck-Institut für Mathematik, Bonn, Germany. *Arithmetic Statistics, Automorphic Forms and Ergodic Methods*.   2023/04/24

Teaching Experiences

UIUC

- Taught discussion sections: Math 220 (Calc, FA23), 241 (Calc 3, FA21), 234 (Calc for Business, SP21).

- Grader: Math 444 (Real Analysis, SP23, FA22), 241 (Calc 3, SP23), 347 (Fundamental Math, SP20), 416 (Abstract Linear Algebra, SP20, FA19), 285/286 (ODE, FA19).

- Worked for NetMath (SP22) and CBTF (FA20).

- Ranked as **Excellent** by students (CITL link), SP21, Math 234.

Service & Awards

- **Referee service:** Proc. Amer. Math. Soc. (1); Ramanujan J. (1); Izv. Math. (1).

- Philippe Tondeur Dissertation Prize   2024

- Bateman Prize in Number Theory   2024

- Paul T. Bateman Fellowship in Number Theory   2023

Languages

- English (fluent); Français (A1); Chinese (native language).

- C, C++, Mathematica, MATLAB, Pari/GP.