

# QIHANG SUN

Institut des Hautes Études Scientifiques (IHES), France

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## Research Interests

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

## Work Experience

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### 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

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### 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

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*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](https://arxiv.org/abs/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](https://arxiv.org/abs/2510.04873)

#### 5. Vanishing properties of Kloosterman sums and Dyson's conjectures.

*Ramanujan J.* **66**(50), 2025. (54 pages)

arXiv: [2406.07469](https://arxiv.org/abs/2406.07469)

#### 4. Exact formulae for ranks of partitions.

*Trans. Amer. Math. Soc.* **379**(3), 2026. (59 pages)

arXiv: [2406.06294](https://arxiv.org/abs/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

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### 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

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### 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

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- **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

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- English (fluent); Français (A1); Chinese (native language).
- C, C++, Mathematica, MATLAB, Pari/GP.