

## Kai (Steve) Fan

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RESEARCH INTERESTS	Analytic number theory: the distribution of primes, zeta and $L$ -functions, asymptotic and statistical behaviors of arithmetic functions	
EDUCATION	<b>Dartmouth College</b> Ph.D. Candidate, Mathematics, November 2023 M.A. in Mathematics, February 2020  <b>Southeast University</b> B.S. in Mathematics and Applied Mathematics, June 2015	
CURRENT POSITION	<b>Max Planck Institute for Mathematics</b> Postdoctoral fellow, starting January 2024	
PUBLICATIONS AND PREPRINTS	<p>[1] <i>LCM products and <math>\kappa</math>-colossally abundant numbers</i> (with Mitsuo Kobayashi and Grant Molnar), manuscript in preparation.</p> <p>[2] <i>Shifted-prime divisors</i> (with Carl Pomerance), submitted, 2024. <a href="https://arxiv.org/abs/2401.10427">arXiv:2401.10427</a></p> <p>[3] <i>Weighted Erdős–Kac theorems via computing moments</i>, accepted by Acta Arith., 2023. <a href="https://arxiv.org/abs/2306.11289v9">arXiv:2306.11289v9</a></p> <p>[4] <i>On a super telescoping sum representing binomial coefficients</i>, accepted by Rocky Mountain J. Math., 2023.</p> <p>[5] <i>Numerically explicit estimates for the distribution of rough numbers</i>, accepted by J. Number Theory, 2023. <a href="https://arxiv.org/abs/2306.03347v6">arXiv:2306.03347v6</a></p> <p>[6] <i>An inequality related to the sieve of Eratosthenes</i> (with Carl Pomerance), J. Number Theory <b>254</b> (2024), 169–183.</p> <p>[7] <i>An inequality for the distribution of numbers free of small prime factors</i>, Integers <b>22</b> (2022), #A26, 12 pp.</p> <p>[8] <i>The second largest Balaban index (sum-Balaban index) of unicyclic graphs</i> (with Wei Fang, Yubin Gao and Zhongshan Li), J. Math. Res. Appl. <b>37</b> (2017), 391–403.</p> <p>[9] <i>A finite difference scheme for semilinear space-fractional diffusion equations with time delay</i> (with Wanrong Cao, Zhaopeng Hao and Zhizhong Sun), Appl. Math. Comput. <b>275</b> (2016), 238–254.</p>	
MISCELLANEOUS NOTES	[1] <i>The Davenport–Halberstam theorem for Möbius function</i>	

- [2] *Harmonic sums in arithmetic progressions*
- [3] *The Erdős–Kac theorem*
- [4] *The asymptotic for the second moment of  $\zeta(s)$  on the critical line*
- [5] *On Selberg’s proof of Dirichlet’s theorem on arithmetic progressions*
- [6] *A short note on convex functions*
- [7] *The Copeland–Erdős theorem on normal numbers*
- [8] *On geometric proofs of theorems on sums of squares*
- [9] *Vinogradov’s estimate for the least quadratic non-residues*
- [10] *Note on chapter 26 of Davenport’s multiplicative number theory*
- [11] *The Erdős–Ginzburg–Ziv theorem*
- [12] *Summability and the closed graph theorem*

SEMINAR TALKS

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|-----|------|--|
| Feb | 2024 | <i>Counting shifted-prime divisors</i> , Number Theory Lunch Seminar, MPIM   |
| Feb | 2024 | <i>Counting shifted-prime divisors</i> , Algebra and Number Theory Seminar, Dartmouth College  |
| Oct | 2023 | <i>Arithmetic combinatorics: integer partitions and sequences</i> , Graduate Student Seminar, Dartmouth College                      |
| Apr | 2023 | <i>Building finite fields through counting</i> , Graduate Student Seminar, Dartmouth College   |
| Feb | 2023 | <i>Quadratic reciprocity via linear algebra</i> , Graduate Student Seminar, Dartmouth College  |
| Nov | 2022 | <i>Roth’s theorem on arithmetic progressions</i> , Graduate Student Seminar, Dartmouth College                                       |
| May | 2022 | <i>Gaps between consecutive primes</i> , Graduate Student Seminar, Dartmouth College   |
| Apr | 2022 | <i>LCM products and <math>\kappa</math>-colossally abundant numbers</i> , Algebra and Number Theory Seminar, Dartmouth College       |
| Mar | 2022 | <i>The Prime Number Theorem: From the classical method to the pretentious approach</i> , Graduate Student Seminar, Dartmouth College |
| Nov | 2021 | <i>Zeros of the Riemann zeta-function and Hardy’s theorem</i> , Graduate Student Seminar, Dartmouth College                          |
| Apr | 2021 | <i>The transcendence of <math>e</math> and <math>\pi</math></i> , Graduate Student Seminar, Dartmouth College                        |

UNDERGRADUATE  
TALKS & REPORTS

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|-------|------|--|
| June  | 2015 | <i>Ruled surfaces and isometric correspondence</i> , Southeast University  |
| March | 2015 | <i>Semilinear space-fractional diffusion equations with time delay and numerical modeling</i> , Southeast University |

TEACHING AT DARTMOUTH	Fall	2022	Instructor, Math 11: Accelerated Multivariable Calculus
	Fall	2021	Instructor, Math 1: Introduction to Calculus
	Summer	2020	Lecturer, Math Camp: Exploring Mathematics
	Spring	2020	TA, Math 13: Multivariable Calculus
	Fall	2019	TA, Math 23: Differential Equations
	Winter	2019	TA, Math 3: Introduction to Calculus
	Fall	2018	TA, Math 3: Introduction to Calculus
ATTENDED NUMBER THEORY COURSES AND SEMINARS	Jan 2023		Joint Mathematics Meetings
	2021–Present		Number Theory Web Seminar
	2018–Present		Algebra and Number Theory Seminar, Dartmouth College
	Nov 2021–Present		Webinar in Additive Combinatorics
	Oct 2021		2021 Maine-Quebec Number Theory Conference
	May–Aug 2021		Harmonic Analysis and Analytic Number Theory (Dual Trimester Program), Hausdorff Center for Mathematics
	Feb 2021–Present		Virtual Brazilian Number Theory Seminar
	June–July 2021		Summer School in Analytic Number Theory (Virtual Sessions)
	May 2021		Rational Points and Galois Representations (Online Workshop)
	Winter 2021		Math 790: Introduction to Transcendence Theory, Duke University
	Winter 2021		Math 105: Topics in Number Theory, Dartmouth College
	Fall 2020		Math 249A: Topics in Number Theory (virtual), Stanford University
Spring 2019		Math 105: Topics in Number Theory, Dartmouth College	
HONORS AND AWARDS	2018–2023		Dartmouth Graduate Fellowship, Dartmouth College
	2013–2014		National Undergraduate Scholarship (Nationally Top 1%), Ministry of Education of China
	2011–2014		Undergraduate Academic Scholarship, Southeast University
SKILLS AND ACTIVITIES			Languages: Mandarin Chinese (Native Speaker), English (Fluent)
			Computer Skills: C, C++, Python, HTML, $\text{\LaTeX}$ , Mathematica, MATLAB
			Assisted in reviewing problems for 2020–2021 Utah Math Olympiads