

Stanford

Kannan Soundararajan

Anne T. and Robert M. Bass Professor of the School of Humanities and Sciences
Mathematics

Bio

ACADEMIC APPOINTMENTS

- Professor, Mathematics

Teaching

COURSES

2023-24

- Modern Mathematics: Discrete Methods: MATH 62DM (Win)
- Topics in Number Theory: MATH 249C (Spr)

2022-23

- Elementary Theory of Numbers: MATH 152 (Win)
- Modern Mathematics: Discrete Methods: MATH 62DM (Win)
- Topics in number theory: MATH 249A (Aut)

2021-22

- Modern Mathematics: Discrete Methods: MATH 62DM (Win)
- Topics in number theory: MATH 249A (Aut)

2020-21

- Elementary Theory of Numbers: MATH 152 (Win)
- Modern Mathematics: Discrete Methods: MATH 62DM (Win)
- Topics in number theory: MATH 249A (Aut)

STANFORD ADVISEES

Postdoctoral Faculty Sponsor

Jared Duker Lichtman, Alexandre de Faveri

Doctoral Dissertation Advisor (AC)

Rodrigo Angelo, Joao Campos Vargas, Matt Tyler, Max Xu

Publications

PUBLICATIONS

- **A supplement to Chebotarev's density theorem** *SCIENCE CHINA-MATHEMATICS*
Harcos, G., Soundararajan, K.

2023

- **Almost all entries in the character table of the symmetric group are multiples of any given prime** *JOURNAL FUR DIE REINE UND ANGEWANDTE MATHEMATIK*
Peluse, S., Soundararajan, K.
2022
- **A model problem for multiplicative chaos in number theory** *ENSEIGNEMENT MATHEMATIQUE*
Soundararajan, K., Zaman, A.
2022; 68 (3-4): 307-340
- **The distribution of consecutive prime biases and sums of sawtooth random variables** *MATHEMATICAL PROCEEDINGS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY*
Oliver, R., Soundararajan, K.
2020; 168 (1): 149–69
- **THE MEAN SQUARE OF THE PRODUCT OF A DIRICHLET L-FUNCTION AND A DIRICHLET POLYNOMIAL** *FUNCTIOES ET APPROXIMATIO COMMENTARII MATHEMATICI*
Conrey, B., Iwaniec, H., Soundararajan, K.
2019; 61 (2): 147–77
- **WEAK SUBCONVEXITY WITHOUT A RAMANUJAN HYPOTHESIS** *DUKE MATHEMATICAL JOURNAL*
Soundararajan, K., Thorner, J., Brumley, F.
2019; 168 (7): 1231–68
- **Maximum of the Riemann Zeta Function on a Short Interval of the Critical Line** *COMMUNICATIONS ON PURE AND APPLIED MATHEMATICS*
Arguin, L., Belius, D., Bourgade, P., Radziwill, M., Soundararajan, K.
2019; 72 (3): 500–535
- **Fourier optimization and prime gaps** *COMMENTARII MATHEMATICI HELVETICI*
Carneiro, E., Milinovich, M. B., Soundararajan, K.
2019; 94 (3): 533–68
- **A MORE INTUITIVE PROOF OF A SHARP VERSION OF HALASZ'S THEOREM** *PROCEEDINGS OF THE AMERICAN MATHEMATICAL SOCIETY*
Granville, A., Harper, A. J., Soundararajan, K.
2018; 146 (10): 4099–4104
- **The variance of divisor sums in arithmetic progressions** *FORUM MATHEMATICUM*
Rodgers, B., Soundararajan, K.
2018; 30 (2): 269–93
- **Nonzero coefficients of half-integral weight modular forms mod 1** *RESEARCH IN THE MATHEMATICAL SCIENCES*
Bellaïche, J., Green, B., Soundararajan, K.
2018; 5
- **Large character sums: Burgess's theorem and zeros of L-functions** *JOURNAL OF THE EUROPEAN MATHEMATICAL SOCIETY*
Granville, A., Soundararajan, K.
2018; 20 (1): 1–14
- **CORRIGENDUM TO "CONDITIONAL BOUNDS FOR THE LEAST QUADRATIC NON-RESIDUE AND RELATED PROBLEMS"** *MATHEMATICS OF COMPUTATION*
Lamzouri, Y., Li, X., Soundararajan, K.
2017; 86 (307): 2551-2554
- **LOWER BOUNDS FOR THE VARIANCE OF SEQUENCES IN ARITHMETIC PROGRESSIONS: PRIMES AND DIVISOR FUNCTIONS** *QUARTERLY JOURNAL OF MATHEMATICS*
Harper, A. J., Soundararajan, K.
2017; 68 (1): 97-123
- **ON SHORT SUMS OF TRACE FUNCTIONS** *ANNALES DE L INSTITUT FOURIER*
Fouvry, E., Kowalski, E., Michel, P., Raju, C. S., Rivat, J., Soundararajan, K.

2017; 67 (1): 423-449

● **Selberg's central limit theorem for log vertical bar zeta(1/2)** *ENSEIGNEMENT MATHEMATIQUE*

Radziwill, M., Soundararajan, K.

2017; 63 (1-2): 1–19

● **Unexpected biases in the distribution of consecutive primes.** *Proceedings of the National Academy of Sciences of the United States of America*

Lemke Oliver, R. J., Soundararajan, K.

2016; 113 (31): E4446-54

● **Riemann hypothesis for period polynomials of modular forms.** *Proceedings of the National Academy of Sciences of the United States of America*

Jin, S., Ma, W., Ono, K., Soundararajan, K.

2016; 113 (10): 2603-2608

● **Moments and distribution of central L-values of quadratic twists of elliptic curves** *INVENTIONES MATHEMATICAE*

Radziwill, M., Soundararajan, K.

2015; 202 (3): 1029-1068

● **CONDITIONAL BOUNDS FOR THE LEAST QUADRATIC NON-RESIDUE AND RELATED PROBLEMS** *MATHEMATICS OF COMPUTATION*

Lamzouri, Y., Li, X., Soundararajan, K.

2015; 84 (295): 2391-2412

● **The number of nonzero coefficients of modular forms (mod p)** *ALGEBRA & NUMBER THEORY*

Bellaïche, J., Soundararajan, K.

2015; 9 (8): 1825-1856

● **Carries, Group Theory, and Additive Combinatorics** *AMERICAN MATHEMATICAL MONTHLY*

Diaconis, P., Shao, X., Soundararajan, K.

2014; 121 (8): 674-688

● **Critical zeros of Dirichlet L-functions** *JOURNAL FUR DIE REINE UND ANGEWANDTE MATHEMATIK*

Conrey, J. B., Iwaniec, H., Soundararajan, K.

2013; 681: 175-198

● **A generalization of the Pólya-Vinogradov inequality** *RAMANUJAN JOURNAL*

Frolenkov, D. A., Soundararajan, K.

2013; 31 (3): 271-279

● **The prime geodesic theorem** *JOURNAL FUR DIE REINE UND ANGEWANDTE MATHEMATIK*

Soundararajan, K., Young, M. P.

2013; 676: 105-120

● **CONTINUOUS LOWER BOUNDS FOR MOMENTS OF ZETA AND L-FUNCTIONS** *MATHEMATIKA*

Radziwill, M., Soundararajan, K.

2013; 59 (1): 119-128

● **An asymptotic expansion related to the Dickman function** *RAMANUJAN JOURNAL*

Soundararajan, K.

2012; 29 (1-3): 25-30

● **The Sixth Power Moment of Dirichlet L-Functions** *GEOMETRIC AND FUNCTIONAL ANALYSIS*

Conrey, J. B., Iwaniec, H., Soundararajan, K.

2012; 22 (5): 1257-1288

● **Counting smooth solutions to the equation A plus B=C** *PROCEEDINGS OF THE LONDON MATHEMATICAL SOCIETY*

Lagarias, J. C., Soundararajan, K.

2012; 104: 770-798

● **Random Multiplicative Functions in Short Intervals** *INTERNATIONAL MATHEMATICS RESEARCH NOTICES*

Chatterjee, S., Soundararajan, K.

2012: 479-492

• **Small gaps between zeros of twisted L-functions** *ACTA ARITHMETICA*

Conrey, J. B., Iwaniec, H., Soundararajan, K.

2012; 155 (4): 353-371

• **A RULE OF THUMB FOR RIFFLE SHUFFLING** *ANNALS OF APPLIED PROBABILITY*

Assaf, S., Diaconis, P., Soundararajan, K.

2011; 21 (3): 843-875

• **Bounding vertical bar zeta(1/2+it)vertical bar on the Riemann hypothesis** *BULLETIN OF THE LONDON MATHEMATICAL SOCIETY*

Chandee, V., Soundararajan, K.

2011; 43: 243-250

• **Smooth solutions to the abc equation: the xyz Conjecture** *JOURNAL DE THEORIE DES NOMBRES DE BORDEAUX*

Lagarias, J. C., Soundararajan, K.

2011; 23 (1): 209-234

• **On modular signs** *MATHEMATICAL PROCEEDINGS OF THE CAMBRIDGE PHILOSOPHICAL SOCIETY*

Kowalski, E., Lau, Y., Soundararajan, K., Wu, J.

2010; 149: 389-411

• **Weak subconvexity for central values of L-functions** *ANNALS OF MATHEMATICS*

Soundararajan, K.

2010; 172 (2): 1469-1498

• **Quantum unique ergodicity for $\mathrm{SL}_2(\mathbb{Z}) \backslash \mathbb{H}$** *ANNALS OF MATHEMATICS*

Soundararajan, K.

2010; 172 (2): 1529-1538

• **Mass equidistribution for Hecke eigenforms** *ANNALS OF MATHEMATICS*

Holowinsky, R., Soundararajan, K.

2010; 172 (2): 1517-1528

• **Fixed Points for Discrete Logarithms** *9th International Symposium on Algorithmic Number Theory*

Levin, M., Pomerance, C., Soundararajan, K.

SPRINGER-VERLAG BERLIN.2010: 6–15

• **The second moment of quadratic twists of modular L-functions** *JOURNAL OF THE EUROPEAN MATHEMATICAL SOCIETY*

Soundararajan, K., Young, M. P.

2010; 12 (5): 1097-1116

• **Moments of the Riemann zeta function** *ANNALS OF MATHEMATICS*

Soundararajan, K.

2009; 170 (2): 981-993

• **Partial sums of the Möbius function** *JOURNAL FÜR DIE REINE UND ANGEWANDTE MATHEMATIK*

Soundararajan, K.

2009; 631: 141-152

• **On the distribution of imaginary parts of zeros of the Riemann zeta function, II** *MATHEMATISCHE ANNALEN*

Ford, K., Soundararajan, K., Zaharescu, A.

2009; 343 (3): 487-505

• **Extreme values of zeta and L-functions** *MATHEMATISCHE ANNALEN*

Soundararajan, K.

2008; 342 (2): 467-486

• **The distribution of smooth numbers in arithmetic progressions** *CRM Workshop on the Anatomy of Integers*

Soundararajan, K.

AMER MATHEMATICAL SOC.2008: 115–128

- **Pretentious multiplicative functions and an inequality for the zeta-function** *CRM Workshop on the Anatomy of Integers*

Granville, A., Soundararajan, K.

AMER MATHEMATICAL SOC.2008: 191–197

- **An uncertainty principle for arithmetic sequences** *ANNALS OF MATHEMATICS*

Granville, A., Soundararajan, K.

2007; 165 (2): 593-635

- **Benford's law for the 3 alpha+1 function** *JOURNAL OF THE LONDON MATHEMATICAL SOCIETY-SECOND SERIES*

Lagarias, J. C., Soundararajan, K.

2006; 74: 289-303