

# Stanford

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## Kannan Soundararajan

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

Mathematics

### Bio

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#### ACADEMIC APPOINTMENTS

- Professor, Mathematics

### Teaching

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#### COURSES

##### 2024-25

- Groups and Rings: MATH 120 (Spr)
- Modern Mathematics: Discrete Methods: MATH 62DM (Win)

##### 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)

#### STANFORD ADVISEES

##### Postdoctoral Faculty Sponsor

Katy Woo

##### Doctoral Dissertation Advisor (AC)

Joao Campos Vargas, Alex Lopez

##### Doctoral (Program)

Travor Liu

### Publications

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#### 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** *FUNCTIONES 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  $l$**  *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 FÜR DIE REINE UND ANGEWANDTE MATHEMATIK*  
Conrey, J. B., Iwaniec, H., Soundararajan, K.  
2013; 681: 175-198
- **A generalization of the Plya-Vinogradov inequality** *RAMANUJAN JOURNAL*  
Frolenkov, D. A., Soundararajan, K.  
2013; 31 (3): 271-279
- **The prime geodesic theorem** *JOURNAL FÜR 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  $A + B = C$**  *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  $SL_2(\mathbb{Z}) \backslash \mathbb{H}$**  *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 Mobius function** *JOURNAL FUR 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