

Curriculum Vitae

Angel V. Kumchev

CONTACT INFORMATION

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ACADEMIC EMPLOYMENT

- **Assistant Department Chair:** Towson University, 08/2023–present
- **Professor:** Towson University, 08/2016–present
- **Acting Associate Dean, FCSM:** Towson University, 07/2018–02/2019
- **Director, Applied Math Lab:** Towson University, 09/2013–07/2018
- **Associate Professor:** Towson University, 08/2010–07/2016
- **Assistant Professor:** Towson University, 08/2005–07/2010
- **Postdoc:** University of Texas at Austin, 01/2003–07/2005
- **Postdoc:** University of Toronto, 07/2001–12/2002

EDUCATION

- **Ph.D. in Mathematics:** University of South Carolina, 08/1997–08/2001
- **B.S. and M.S. in Mathematics:** Plovdiv University, 09/1991–07/1996

GRANTS AND AWARDS

2018–2023: PI for NSF Grant DMS-1800033: Mid-Atlantic Seminar On Numbers (MASON), with N. McNew.

2016–2018: PI for AML Contract with Exelon Corp.: Forecasting Natural Gas Demand, with Y. Cui and X. Wang.

2016: Outstanding Faculty Award, Fisher College of Science and Mathematics, Towson University

2015–2016: PI for AML Contract with RTR Technologies LLP: Automated Model Baselineing, with A. Kolesnikov.

2008: Excellence in Scholarship Award, Fisher College of Science and Mathematics, Towson University

2006: Summer Research Fellowship Award, Towson University

PUBLICATIONS

49. *Explicit bounds for large gaps between cubefree integers* (with W. McCormick, N. McNew, A. Park, R. Scherr, and W. Ziehr), submitted.
48. *A framework for discrete bilinear spherical averages and applications to ℓ^p -improving estimates* (with T. Anderson and E. Palsson), to appear in *Colloq. Math.*
47. *Short interval results for powerfree polynomials over a finite field* (with N. McNew and A. Park), to appear in *Int. J. Number Theory*.
46. *Explicit bounds for large gaps between squarefree integers* (with W. McCormick, N. McNew, A. Park, R. Scherr, and W. Ziehr), *J. Number Theory* **254** (2024), 336–357.
45. *Discrete maximal operators over surfaces of higher codimension* (with T. Anderson and E. Palsson), (*La Matematica* **1** (2022), 442–479).
44. *On the ergodic Waring–Goldbach problem* (with T. Anderson, B. Cook, and K. Hughes), *J. Funct. Anal.* **282** (2022), Paper 109334, 39 pp.
43. *On a two-dimensional exponential sum*, in “Combinatorial and Additive Number Theory IV” (Proceedings of the CANT Workshops, New York, NY: May 21–24, 2019 and June 1–5, 2020), Springer, Cham, 2021, pp. 371–383.
42. *Hilbert transforms and the equidistribution of zeros of polynomials* (with E. Carneiro, M. Das, A. Florea, A. Malik, M. Milinovich, C. Turnage-Butterbaugh, and J. Wang), *J. Funct. Anal.* **281** (2021), Paper 109199, 25 pp.
41. *A hybrid of two theorems of Piatetski-Shapiro* (with Zh. Petrov), *Monatsh. Math.* **189** (2019), 355–376.
40. *Improved ℓ^p -boundedness for integral k -spherical maximal functions* (with T. Anderson, B. Cook, and K. Hughes), *Discrete Anal.* **2018**, Paper 10, 18 pp.
39. *On sums of powers of almost equal primes* (with H.F. Liu), *J. Number Theory* **176** (2017), 344–364.
38. *The strong symmetric genus spectrum of abelian groups* (with C. May and J. Zimmerman), *Arch. Math. (Basel)* **108** (2017), 341–350.
37. *On the Waring–Goldbach problem for seventh and higher powers* (with T. Wooley), *Monatsh. Math.* **183** (2017), 303–310.
36. *Sieve methods and exponential sums: An interplay between combinatorics and harmonic analysis*, in “Prime Numbers and Representation Theory” (Proceedings of the Workshops on Number Theory, Beijing: July 20–28, 2014 and July 16–31, 2015), Science Press, Beijing, 2017, pp. 13–47.
35. *On the Waring–Goldbach problem for eighth and higher powers* (with T. Wooley), *J. London Math. Soc.* **93** (2016), 811–824.
34. *Sums of four squares of primes* (with L. Zhao), *Mathematika* **62** (2016), 348–361.
33. *On Weyl sums over primes in short intervals*, in “Number Theory: Arithmetic in Shangri-La” (Proceedings of the China–Japan Seminar on Number Theory, Shanghai, August 15–17, 2011), World Scientific, Singapore, 2013, pp. 116–131.
32. *On the fractional parts of a^n/n* (with J. Cilleruelo, F. Luca, J. Rué, and I. Shparlinski), *Bull. London Math. Soc.* **45** (2013), 249–256.
31. *On the convergence of some alternating series*, *Ramanujan J.* **30** (2013), 101–116.
30. *Estimation of the commodity flow of chlorine from storage data* (with D. Howell, A. Kolesnikov, P. O’Neill, and M. Tiger), *J. Transp. Secur.* **5** (2012), 51–68.
29. *Sums of almost equal squares of primes* (with T. Li), *J. Number Theory* **132** (2012), 608–636.
28. *On sums of Ramanujan sums* (with T.H. Chan), *Acta Arith.* **152** (2012), 1–10.
27. *Additive bases arising from functions in a Hardy field* (with T.H. Chan and M. Wierdl), *Acta Math. Hungar.* **129** (2010), 263–276.

26. *On sums of squares of primes II* (with G. Harman), J. Number Theory **130** (2010), 1969–2002.
25. *Sums of primes and squares of primes in short intervals* (with J. Liu), Monatsh. Math. **157** (2009), 335–363.
24. *A binary additive equation involving fractional powers*, Int. J. Number Theory **5** (2009), 281–292.
23. *On sums of primes from Beatty sequences*, Integers **8** (2008), #A08.
22. *On the irreducibility of a truncated binomial expansion* (with M. Filaseta and D. Pasechnik), Rocky Mountain J. Math. **37** (2007), 455–464.
21. *On Weyl sums over primes and almost primes*, Michigan Math. J. **54** (2006), 243–268.
20. *On sums of squares of primes* (with G. Harman), Math. Proc. Cambridge Philos. Soc. **140** (2006), 1–13.
19. *Mean values of Dirichlet polynomials and applications to linear equations with prime variables* (with S. Choi), Acta Arith. **123** (2006), 125–142.
18. *On sums of three squares* (with S. Choi and R. Osburn), Int. J. Number Theory. **1** (2005), 161–173.
17. *An invitation to additive prime number theory* (with D. Tolev), Serdica Math. J. **31** (2005), 1–74.
16. *The Waring–Goldbach problem for seventh powers*, Proc. Amer. Math. Soc. **133** (2005), 2927–2937.
15. *On the Waring–Goldbach problem: Exceptional sets for sums of cubes and higher powers*, Canad. J. Math. **57** (2005), 298–327.
14. *Quadratic equations with five prime unknowns* (with S. Choi), J. Number Theory **107** (2004), 357–367.
13. *The distribution of prime ideals of imaginary quadratic fields* (with G. Harman and P. Lewis), Trans. Amer. Math. Soc. **356** (2004), 599–620.
12. *The difference between consecutive primes in an arithmetic progression*, Quart. J. Math. Oxford (2) **53** (2002), 479–501.
11. *On a binary Diophantine inequality involving prime powers* (with M. Laporta), in "Number Theory for the Millennium", vol. 2, AK Peters, 2002, pp. 307–329.
10. *Diophantine approximation by cubes of primes and an almost prime II* (with J. Brüdern), Illinois J. Math. **45** (2001), 309–321.
9. *Diophantine approximation by cubes of primes and an almost prime*, Rocky Mountain J. Math. **30** (2000), 961–980.
8. *The k -free divisor problem*, Monatsh. Math. **129** (2000), 321–327.
7. *A note on the $2k$ -th mean value of the Hurwitz zeta function*, Bull. Austral. Math. Soc. **60** (1999), 403–405.
6. *A Diophantine inequality involving prime powers*, Acta Arith. **89** (1999), 311–330.
5. *On the distribution of prime numbers of the form $[n^c]$* , Glasgow Math. J. **41** (1999), 85–102.
4. *On an equation with prime numbers* (with T. Nedeva), Acta Arith. **83** (1998), 117–126.
3. *An additive problem with prime numbers from a thin set* (with D. Tolev), Acta Math. Hungar. **76** (1997), 31–43.
2. *On the Piatetski-Shapiro–Vinogradov theorem*, J. Theor. Nombres Bordeaux **9** (1997), 11–23.
1. *On a system of two Diophantine equations with prime numbers*, C. R. Acad. Bulgar. Sci. **49** (1996), 21–24.

PROFESSIONAL ACTIVITIES

- **Conferences and Workshops:**

- Co-organizer, jointly with N. McNew and others, of the Mid-Atlantic Seminar On Numbers meetings at Towson:
MASON VI (March 18, 2023); MASON V(irtual) (March 27–28, 2021); MASON II (April 7–8, 2018);
MASON I (October 29, 2016).

- Co-organizer of special sessions on Analytic Number Theory at AMS Sectional meetings: #1160 (State College, PA, October 2020); #1082 (Rochester, NY, September 2012); #1052 (State College, PA, October 2009).
 - Co-organizer of AMS special sessions on Analytic Number Theory at JMMs at Baltimore, MD: #1145 (January 2019); #1096 (January 2014).
 - Co-organizer, jointly with M. Boylan, K. James, F. Thorne, and H. Xue, of the 33rd Palmetto Number Theory Series Meeting, Clemson, SC, December 14–15, 2019.
- **Referee work:** Abhandlungen aus dem Mathematischen Seminar der Universität Hamburg, Acta Arithmetica, Acta Mathematica Hungarica, Acta Mathematica Sinica, Advances in Mathematics, Algebra and Number Theory, American Mathematical Monthly, Analele Științifice ale Universității "Al. I. Cuza", Banach Center Publications, Boletín de la Sociedad Matemática Mexicana, Discrete Mathematics, European Journal of Mathematics, Forum Mathematicum, Frontiers of Mathematics in China, Glasgow Mathematical Journal, Illinois Journal of Mathematics, Integers, International Journal of Number Theory, International Mathematics Research Notices, Israel Journal of Mathematics, Involve, Journal of Applied Mathematics and Computing, Journal of the Australian Mathematical Society, Journal of Integer Sequences, Journal of the London Mathematical Society, Journal of Mathematical Analysis and Applications, Journal of Number Theory, Lithuanian Mathematical Journal, Matematicheskii Sbornik, Mathematica Slovaca, Mathematika, Mathematische Annalen, Michigan Mathematical Journal, Monatshefte für Mathematik, Open Mathematics, Periodica Mathematica Hungarica, Proceedings of the American Mathematical Society, Publicationes Mathematicae Debrecen, Ramanujan Journal, Research in Number Theory, Revista Iberoamericana de Matemática, Rocky Mountain Journal of Mathematics, Quarterly Journal of Mathematics, Studia Scientiarum Mathematicarum Hungarica
 - **Grant review work:** NSA Mathematical Sciences Program, National Science Foundation, NSERC of Canada
 - **External reviewer/examiner of Ph.D. theses:**
 - Spring 2023: Shahzad Hathi, University of New South Wales in Canberra, Australia; advised by Tim Trudgian.
 - Winter 2022: Juho Salmensuu, University of Turku, Finland; advised by Kaisa Matomäki.
 - Winter 2021: Konstantinos Poulias, University of Bristol, UK; advised by Trevor Wooley.
 - Fall 2017: Alessandro Gambini, University of Ferrara, Italy; advised by Alessandro Zaccagnini.
 - **Reviewer work:** Mathematical Reviews (since 2000), Zentralblatt MATH (2006–2019)

SEMINAR AND CONFERENCE TALKS

- May 2023: *New versions of old results on gaps between squarefree integers*, 21st Annual Workshop on Combinatorial and Additive Number Theory, New York, NY.
- December 2020: *Discrete maximal functions on surfaces of codimension > 1* , Purdue Analytic Number Theory and Harmonic Analysis Seminar, Purdue University, West Lafayette, IN (virtual).
- June 2020: *Bounds for discrete maximal functions of codimension 3*, 18th Annual Workshop on Combinatorial and Additive Number Theory, New York, NY (virtual).
- March 2020: *Diminishing ranges for Diophantine inequalities*, Fourth Mid-Atlantic Seminar on Numbers, Gettysburg, PA.
- 1998–2019: 34 conference talks and 24 lectures in seminars and colloquia.

TEACHING EXPERIENCE

- at Towson University:
 - Spring 2024: Trigonometry; Introduction to Abstract Math;
 - Fall 2023: Calculus I; Calculus III.
 - Spring 2023: Cryptography (2 sections); Senior Seminar (Topic: Quadratic Reciprocity).
 - Fall 2022: Cryptography (2 sections); Number Theory.
 - Spring 2022: Discrete Mathematics (2 sections); Linear and Nonlinear Programming*.
 - Fall 2021: Calculus I; Introduction to Abstract Math.
 - 2005–2021: College Algebra; Precalculus; Elementary Linear Algebra; Introduction to Abstract Math; Calculus I; Calculus II; Calculus III; Honors Calculus I; Introduction to Abstract Algebra; Differential Equations; Linear Algebra; Number Theory; Algebraic Structures; Introductory Real Analysis; Complex Analysis; Senior Seminar (Topic: Quadratic Reciprocity); Applied Mathematics Laboratory I; Linear and Nonlinear Programming*; Advanced Topics in Applied Operations Research*; Asymptotic and Perturbation Analysis*.
- at the University of Texas (2003–2005):
Discrete Mathematics; Calculus I; Calculus II; Elementary Linear Algebra; Probability; Complex Variables; Topics in Analysis: Distribution of Primes*.
- at the University of Toronto (2001–2002):
Advanced Differential Equations; Single-Variable Calculus (full-year course).

STUDENT SUPERVISION

- Undergraduate research projects:
 - 06/2022–07/2022: *Gaps Between Powerfree Integers*. Wade McCormick (UC Berkeley), Ariana Park (MIT), Russell Scherr (Towson University), and Simon Ziehr (University of Minnesota); REU team supervised jointly with N. McNew.
 - 06/2009–10/2010: *Infinite Series*. Matthew Tiger (Towson University).
- Master's student projects:
 - 09/2013–07/2014: *A Large-Scale Scheduling Problem Subject to Multiple Constraint Classes*. Felipe Pizarro (Towson University).
 - 01/2010–02/2012: *Comparison Between the AKS and Other Primality Tests*. Amanda Williams (Towson University).
 - 09/2008–08/2009: *An Attack on a Modified KMOV Cryptosystem*. Kelly Nulph (Towson University).
- Ph.D. theses:
 - 03/2015–05/2017: *On the Waring–Goldbach Problem with Almost Equal Summands*. Huafeng Liu (Shandong University, China); external co-advisor, jointly with J.Y. Liu.
 - 03/2010–05/2012: *Additive Problems with Prime Numbers*. Taiyu Li (Shandong University, China); external co-advisor, jointly with J.Y. Liu.

*Graduate course.