Dinesh S. Thakur
List of publications and preprints

Full list: Ordered by the year of publication, followed by preprints

1. Number fields and function fields (zeta and gamma functions at all primes)– Proceedings of conference on p-adic analysis, Hengelhoef 1986, 149-157. Publ. Universiteit Brussel, Belgium. Ed. N. De Grande-De Kimpe, L. Van Hamme.

2. **Thesis** Gamma functions and gauss sums for function fields and periods of Drinfeld modules–PhD thesis, Harvard University 1987. (Advisor-John Tate)

3. Gauss sums for $\mathbf{F}_q[T]$ – Inventiones Math. 94, 105-112 (1988).

4. Gross-Koblitz formula for function fields – Proceedings of the congress on p-adic analysis, Trento , May 89; pa. 396, Springer lecture notes in Mathematics no. 1454 (1990) Ed. F. Baldassarri, S. Bosch, B. Dwork.

5. (Jointly with Greg Anderson) Tensor powers of the Carlitz module and zeta values– Annals of Math. 132 (1990), 159-191.

6. Analogies between integers and polynomials – Huzurbazar Memorial lectures, Bombay Mathematical Colloquium, Bulletin, vol. 7, no. 3 (1990), 77-89.

7. (Jointly with V. Chari) On the work of V. G. Drinfeld - Current Science, Vol. 59, No. 24, (1990), 1297-1300.

8. Zeta measure associated to $\mathbf{F}_q[T]$– J. Number theory, 35 (1990), 1-17.

9. Gamma functions for function fields and Drinfeld modules– Annals of maths, 134 (1991), 25-64.

10. Gauss sums for function fields – J. Number theory, 37 (1991), 242-252.

11. Continued fraction for the exponential for $\mathbf{F}_q[T]$ – J. Number theory, 41 (1992), 150-155.

12. Drinfeld modules and Arithmetic in the function fields — International Mathematics Research Notices, No. 9 (1992), 185-197, Duke Math. J. vol. 68 (1992).

13. On gamma functions for function fields — 'The Arithmetic of function fields', pa. 75-86, Ed. D. Goss, D. Hayes, M. Rosen. Publ: Walter de Gruyter, NY, Berlin (1992).'

14. Shtukas and Jacobi sums — Inventiones Math. 111, 557-570 (1993).

15. (With an appendix by J. F. Voloch) Behavior of function field Gauss sums at ∞— Bull. London Math. Soc. 25 (1993), 417-426.

16. Iwasawa theory and cyclotomic function fields. – Proceedings of the conference on Arithmetic geometry, Contemporary Math. vol. 174 (1994), American Math. Soc., pa. 157-165. Edited by J. Jones and N. Childress.

17. Hypergeometric functions for function fields – Finite fields and their applications, Vol. 1, (Carlitz special issue), 219-231, (1995).

18. On characteristic p zeta functions – Compositio Math. Vol. 99 (1995), 231-247.

19. Exponential and Continued fractions – J. Number theory, 59 (1996), 248-261.

20. Automata-style proof of Voloch's transcendence result – J. Number theory, 58 (1996), 60-63.

21. Transcendence of Gamma values for $\mathbf{F}_q[T]$ – Annals of Math. 144 (1996), 181-188.

22. Patterns of continued fractions for the analogues of e and related numbers in the function field case – J. Number Theory, 66 (1997), 129-147.

23. Automata and Transcendence - Number Theory, Edited by V. Kumar Murty and M. Waldschmidt, Contemporary Math. vol. 210, (1997), American Math. Soc., pa. 387-399. Proceedings of the International conference on Discrete mathematics and Number theory.

24. (Jointly with Robert M. Beals) Computational classification of numbers and algebraic properties– International Mathematics Research Notices, 15 (1998), 799-818.

25. Diophantine approximation exponents and continued fractions for algebraic power series – J. Number Theory, 79 (1999), 284-291.

26. An alternate approach to solitons for $\mathbf{F}_q[T]$– J. Number Theory, 76 (1999), 301-319.

27. (Jointly with Jean-Paul Allouche) Automata and transcendence of the Tate period in finite characteristic– Proceedings of American Mathematical Society, 127 (1999), 1309-1312.

28. Hypergeometric functions for function fields II – J. Ramanujan Math. Soc. 15 (2000), 43-52.

29. **Four** expository articles (i) Introduction, (ii) Quadratic and cyclotomic fields, (iii) Fermat's last theorem for regular primes, (iv) Overview and interconnections in 'Cyclotomic fields and related topics', Proceedings of the summer school (June 7-30, 1999), Edited by S. D. Adhikari, S. A. Katre and D. S. Thakur, Published by Bhaskaracharya Pratishthan, October 2000.

30. (**Editor**) 'Cyclotomic fields and related topics', Proceedings of the summer school (June 7-30, 1999), Edited by S. D. Adhikari, S. A. Katre and D. S. Thakur, Published by Bhaskaracharya Pratishthan, October 2000.

31. (Joint with M. Kim and J. Voloch) Diophantine approximation and deformation – Bull. Soc. Math. France, 128 (2000), 585-598.

32. L-functions and modular forms in finite characteristic – Proceedings of the International conference on Cohomology of arithmetic groups, L-functions and Automorphic forms, Mumbai 1998, Edited by T. N. Venkataramana (2001), 214-228. Published for Tata Institute of Fundamental Research by Narosa Publ., distributed by AMS.

33. Integrable systems and number theory in finite characteristic – Advances in nonlinear mathematics and science, special issue, Proceedings

of conference 'Integrating integrability into mathematics and science (Non-linear world of Vladimir Zakharov)', October 99 in Physica D, vol. 152-153, (2001), 1-8.

34. Elliptic curves in function field arithmetic – In 'Current Trends in Number Theory', Ed. S. D. Adhikar, S. A. Katre and B. Ramakrishnan: the proceedings of 'International conference on number theory', Harish-Chandra Research Institute, November 2000. Published by Hindustan Book Agency, New Delhi, March 2002. pp. 215-238.

35. Diophantine approximation in finite characteristic– 'Algebra, Arithmetic and Geometry with Applications' (Papers from Shreeram S. Abhyankar's 70th Bithday conference) —Edited by Chris Christensen, Ganesh Sundaram, Avinash Sathaye, Chandrajit Bajaj, Springer 2003, pp. 757-765. (Proceedings of the 'Conference on algebra and algebraic geometry with applications', Purdue University, July 2000)

36. **Book** 'Function Field Arithmetic' —-World Scientific, New Jersey, May 2004.

37. Recent developments in Function Field Arithmetic — 'The Mathematics Student' proceedings of Centenary meeting of Indian Mathemetical Society, Vol.76, Nos. 1-4 (2007), 163-170.

38. Diophantine approximation and transcendence in finite characteristic —- 'Diophantine equations' –Editor N. Saradha, (2008), 265-278, Narosa Pub. House. Proceedings of International conference on Diophantine equations (DION 2005), TIFR December 2005,

39. (**Book, Edited** with David Savitt) 'p-adic geometry: Lectures from the 2007 Arizona Winter School' containing articles based on lectures at the school by Conrad, Teitelbaum (Dasgupta), Baker, Kedlaya and contributions by John Tate and Vladimir Berkovich. Published by American Mathematical Society. University Lecture Series, vol. 45, Sep. 2008.

40. Approximation exponents in function fields — In "Analytic Number Theory — Essays in honour of Klaus Roth" edited by W. Chen, T.

Gowers, H. Halberstam, W. Schmidt, R. C. Vaughn; pp. 421-435, Cambridge U. Press, 2009.

41. (Joint with Z. Wen, J. Yao, L. Zhao) Hypergeometric functions for function fields and transcendence, Comptes Rendus Acad. Sci. Paris, Ser I 347 (2009) 467-472.

42. Power sums of reciprocals of polynomials and applications to multizeta values and zeta zero distribution for $F_q[t]$. Finite Fields and Their Applications, Vol 15, Issue 4 (2009), 534-552.

43. (Joint with Greg Anderson) Multizeta values for $F_q[t]$, their period interpretation and relations between them. International Mathematics Research Notices IMRN (2009) no. 11, 2038-2055.

44. Relations between multizeta values for $F_q[t]$. International Mathematics Research Notices IMRN (2009) no. 12, 2318-2346.

45. Recent progress and open problems in function field arithmetic – The influence of John Tate's work—- Pure and Applied Mathematics Quarterly, Vol. 6, No. 1, (Special issue: In honor of John Tate, part 2 of 2) 1-20 (2010).

    Reprinted in 'Wolf prize in Mathematics', Vol. 4, ed. by Y. Sinai, E. Stein, 464-483 (2012).

46. (Joint with C.-Y. Chang, M. Papanikolas, J.Yu) Algebraic independence of arithmetic gamma values and Carlitz zeta values. —- Advances in Mathematics, 223 (2010), 1137-1154.

47. Shuffle relations for function field multizeta values. International Mathematics Research Notices IMRN (2010) No. 11, 1973-1980.

48. Higher diophantine approximation exponents and continued fraction symmetries for function fields. Proc. Amer. Math. Soc. 139 (2011), 11-19.

49. (Joint with Z. Wen, J. Yao, L. Zhao) Transcendence in positive characteristics and special values of hypergeometric functions. (Crelle's Journal) J. Reine Angew Math 657 (2011), 135-171.

50. A note on Numerators of Bernoulli numbers, Proc. Amer. Math. Soc. 140 (2012) no. 11, 3673-3676.

51. (Joint with Aaron Ekstrom and Carl Pomerance) Infinitude of elliptic Carmichael numbers, J. Australian Math. Soc. 92 (2012), no. 1, 45-60, special issue in memory of van der Poorten.

52. Binomial and Factorial congruences for $F_q[t]$, Finite Fields and Their Applications 18 (2012) 271-282.

53. From rationality to transcendence in finite characteristic, Journée Annuelles de la Société Mathématique de France (2012) p. 21-48.

54. (Joint with Jim Sauerberg, Linghsueh Shu, George Todd) On infinitude of Wilson primes for $F_q[t]$, Acta Arith. 157 no. 1, 91-100 (2013).

55. Valuations of v-adic power sums and zero distribution for Goss' v-adic zeta for $F_q[t]$. Journal of Integer Sequences, Special Issue in Honor of the 60th Birthday of Jean-Paul Allouche, vol. 16 (2013), Art. 13.2.13, 1-18.

56. (Joint with Greg Anderson) Ihara power series for $F_q[t]$. (Work in progress)

57. Automata methods in transcendence, based on lectures given in a minicourse at ETH and Banff workshop. (For proceedings of Banff workshop on Hodge theory, transcendence and other motivic aspects, to be pub. by EMS)

58. Multizeta in function field arithmetic, based on lecture at Banff workshop. (For proceedings of Banff workshop on Hodge theory, transcendence and other motivic aspects, to be pub. by EMS)

59. Arithmetic of Gamma, Zeta and Multizeta values for function fields. (Advanced Courses in mathematics, CRM, Barcelona, Birkhauser) Arithmetic Geometry for Function Fields of Positive Characteristic, Birkhauser, Springer-Basel.

60. Higher diophantine approximation exponents and continued fraction symmetries for function fields II, Proceedings of American Mathematical Society, 141 (2013), no. 8, 2603-2608.

61. Differential characterization of Wilson primes for $F_q[t]$, To appear in Algebra and Number Theory.

Publications by category

Thesis and Articles in Research Journals:

(I) Gamma functions and gauss sums for function fields and periods of Drinfeld modules–Thesis, Harvard University 1987. (Advisor-John Tate)

(II) Gauss sums for $\mathbf{F}_q[T]$ – Inventiones Math. 94, 105-112 (1988).

(III) (Jointly with Greg Anderson) Tensor powers of the Carlitz module and zeta values– Annals of Math. 132 (1990), 159-191.

(IV) Zeta measure associated to $\mathbf{F}_q[T]$– J. Number theory, 35 (1990), 1-17.

(V) Gamma functions for function fields and Drinfeld modules– Annals of maths, 134 (1991), 25-64.

(VI) Gauss sums for function fields – J. Number theory, 37 (1991), 242-252.

(VII) Continued fraction for the exponential for $\mathbf{F}_q[T]$ – J. Number theory, 41 (1992), 150-155.

(VIII) Drinfeld modules and Arithmetic in the function fields — International Mathematics Research Notices, No. 9 (1992), 185-197, Duke Math. J. vol. 68 (1992).

(IX) Shtukas and Jacobi sums — Inventiones Math. 111, 557-570 (1993).

(X) (With an appendix by J. F. Voloch) Behavior of function field Gauss sums at ∞— Bull. London Math. Soc. 25 (1993), 417-426.

(XI) Hypergeometric functions for function fields – Finite fields and their applications, Vol. 1, (Carlitz special issue), 219-231, (1995).

(XII) On characteristic p zeta functions – Compositio Math. Vol. 99 (1995), 231-247.

(XIII) Exponential and Continued fractions – J. Number theory, 59 (1996), 248-261.

(XIV) Automata-style proof of Voloch's transcendence result – J. Number theory, 58 (1996), 60-63.

(XV) Transcendence of Gamma values for $\mathbf{F}_q[T]$ – Annals of Math. 144 (1996), 181-188.

(XVI) An alternate approach to solitons for $\mathbf{F}_q[T]$– J. Number Theory, 76 (1999), 301-319.

(XVII) Patterns of continued fractions for the analogues of e and related numbers in the function field case – J. Number Theory, 66 (1997), 129-147.

(XVIII) (Jointly with Jean-Paul Allouche) Automata and transcendence of the Tate period in finite characteristic– Proceedings of American Mathematical Society, 127 (1999), 1309-1312.

(XIX) Hypergeometric functions for function fields II – J. Ramanujan Math. Soc. 15 (2000), 43-52.

(XX) (Jointly with Robert M. Beals) Computational classification of numbers and algebraic properties– International Mathematics Research Notices, 15 (1998), 799-818.

(XXI) Diophantine approximation exponents and continued fractions for algebraic power series – J. Number Theory, 79 (1999), 284-291.

(XXII) Log-algebraicity for $F_q[T]$ – Preprint. (Incorporated in the book 'Function Field Arithmetic)

(XXIII) (Joint with M. Kim and J. Voloch) Diophantine approximation and deformation – Bull. Soc. Math. France, 128 (2000), 585-598.

(XXIV) Multizeta values for function fields – Preprint (Incorporated parts in the book 'Function Field Arithmetic').

(XXV) Recent developments in function field arithmetic – The Mathematics student, Indian Mathematical Society, in the special issue for invited talks at Indian Mathematical Society Centenary meeting, Vol 76, Nos. 1-4 (2007), 163-170.

(XXVI) (Joint with C.-Y. Chang, M. Papanikolas, J. Yu) Algebraic independence of arithmetic gamma values and Carlitz zeta values. Advances in Mathematics, 223 (2010), 1137-1154.

(XXVII) (Joint with Greg Anderson) Multizeta values for $F_q[t]$, their period interpretation and relations between them. International Mathematics Research Notices IMRN (2009), no. 11, 2038-2055.

(XXVIII) Relations between multizeta values for $F_q[t]$. International Mathematics Research Notices IMRN (2009), no. 12, 2038-2055.

(XXIX) Power sums of reciprocals of polynomials and applications to multizeta values and zeta zero distribution for $F_q[t]$. Finite Fields and Their Applications, Vol. 15, Issue 4 (Aug. 2009), 534-552.

(XXX) (Joint with Z. Wen, J. Yao, L. Zhao) Transcendence in positive characteristics and special values of hypergeometric functions. Crelle's Journal (J. Reine Angew Math) 657 (2011), 135-171.

(XXXI) (Joint with Z. Wen, J. Yao, L. Zhao) Hypergeometric functions for function fields and transcendence, Comptes Rendus Acad. Sci. Paris. Ser I 347 (2009) 467-472.

(XXXII) Shuffle relations for function field multizeta values. International Mathematics Research Notices IMRN. (2010), No. 11, 1973-1980.

(XXXIII) Higher diophantine approximation exponents and continued fraction symmetries for function fields. Proc. Amer. Math. Soc. 139 (2011), 11-19.

(XXXIV) A note on Numerators of Bernoulli numbers. Proc. Amer. Math. Soc. 140 (2012) no. 11, 3673-3676.

(XXXV) (Joint with Aaron Ekstrom and Carl Pomerance) Infinitude of elliptic Carmichael numbers, J. Australian Math. Soc. 92 (2012), no. 1, 45-60, special issue in memory of van der Poorten.

(XXXVI) Binomial and Factorial congruences for $F_q[t]$, Finite Fields and Their Applications 18 (2012) 271-282.

(XXXVII) Higher diophantine approximation exponents and continued fraction symmetries for function fields II, Proc. Amer. Math. Soc. 141 (2013), no. 8, 2603-2608.

(XXXVIII) (Joint with Jim Sauerberg, Linghsueh Shu, George Todd) On infinitude of Wilson primes for $F_q[t]$, Acta Arith. 157 no. 1, 91-100 (2013).

(XXXIX) Differential characterization of Wilson primes for $F_q[t]$, To appear in Algebra and Number Theory.

(XL) Valuations of v-adic power sums and zero distribution for Goss' v-adic zeta for $F_q[t]$, Journal of Integer Sequences, Special Issue in Honor of the 60th birthday of Jean-Paul Allouche, vol. 16 (2013), Art. 13.2.13, 1-18.

In preparation

(i) (Joint with Greg Anderson) Ihara power series for $F_q[t]$.

Books:

(1) 'Function Field Arithmetic' —-World Scientific, May 2004.

(2) (Editor and contributor) 'Cyclotomic fields and related topics', Proceedings of the summer school (June 7-30, 1999), Edited by S. D. Adhikari, S. A. Katre and D. S. Thakur, Published by Bhaskaracharya Pratishthan, October 2000.

(3) (Edited with David Savitt) 'p-adic geometry: lectures based on Arizona Winter School 2007' containing articles based on lectures and contributions by John Tate and Vladimir Berkovich. Published by American Mathematical Society. Sep. 2008.

Conference proceedings papers in books or Journals based on lectures:

(1) Number fields and function fields (zeta and gamma functions at all primes)– Proceedings of conference on p-adic analysis, Hengelhoef 1986, 149-157. Publ. Universiteit Brussel, Belgium. Ed. N. De Grande-De Kimpe, L. Van Hamme.

(2) Gross-Koblitz formula for function fields – Proceedings of the congress on p-adic analysis, Trento , May 89; pa. 396, Springer lecture notes in Mathematics no. 1454 Ed. F. Baldassarri, S. Bosch, B. Dwork.

(3) Analogies between integers and polynomials – Huzurbazar Memorial lectures, Bombay Mathematical Colloquium, Bulletin, vol. 7, no. 3 (1990), 77-89.

(4) On gamma functions for function fields — 'The Arithmetic of function fields', pa. 75-86, Ed. D. Goss, D. Hayes, M. Rosen. Publ: Walter de Gruyter, NY, Berlin (1992).'

(5) Iwasawa theory and cyclotomic function fields. – Proceedings of the conference on Arithmetic geometry, Contemporary Math. vol. 174 (1994), American Math. Soc., pa. 157-165. Edited by J. Jones and N. Childress.

(6) Automata and Transcendence - Number Theory, Edited by V. Kumar Murty and M. Waldschmidt, Contemporary Math. vol. 210, (1997), American Math. Soc., pa. 387-399. Proceedings of the International conference on Discrete mathematics and Number theory.

(7) L-functions and modular forms in finite characteristic – Proceedings of the International conference on Cohomology of arithmetic groups, L-functions and Automorphic forms, Mumbai 1998, Edited by T. N. Venkataramana (2001), 214-228. Published for Tata Institute of Fundamental Research by Narosa Publ., distributed by AMS.

(8) Integrable systems and number theory in finite characteristic – Advances in nonlinear mathematics and science, special issue, Proceedings of conference 'Integrating integrability into mathematics and science (Non-linear world of Vladimir Zakharov)', October 99 in Physica D, vol. 152-153, (2001), 1-8.

(9) Diophantine approximation in finite characteristic– 'Algebra, Arithmetic and Geometry with Applications' (Papers from Shreeram S. Abhyankar's 70th Bithday conference) —Edited by Chris Christensen, Ganesh Sundaram,

Avinash Sathaye, Chandrajit Bajaj, Springer 2003, pp. 757-765. (Proceedings of the 'Conference on algebra and algebraic geometry with applications', Purdue University, July 2000)

(10) Elliptic curves in function field arithmetic – In 'Current Trends in Number Theory', Ed. S. D. Adhikar, S. A. Katre and B. Ramakrishnan: the proceedings of 'International conference on number theory', Harish-Chandra Research Institute, November 2000. Published by Hindustan Book Agency, New Delhi, March 2002. pp. 215-238.

(11) Diophantine approximation and transcendence in finite characteristic —- 'Diophantine equations', Ed. N. Saradha, Narosa Pub. House (2008), 265-278. Proceedings of International conference on Diophantine equations (DION 2005), TIFR December 2005.

(12) Recent developments in Function Field Arithmetic — Invited article in 'The Mathematics Student' proceedings of Centenary meeting of Indian Mathemetical Society, Vol.76, Nos. 1-4 (2007), 163-170.

(13) Automata methods in transcendence, based on lectures given in a minicourse at ETH and Banff workshop. (For proceedings of Banff workshop to be pub. by EMS)

(14) Multizeta in function field arithmetic, based on lecture at Banff workshop. (For proceedings of Banff workshop to be pub. by EMS)

(15) Arithmetic of Gamma, Zeta and Multizeta values for function fields. (For publication in Advanced Courses in mathematics CRM Barcelona, Birkhauser)

(16) From rationality to transcendence in finite characteristic, Journée Annuelles de la Société Mathématique de France (2012), p. 21-48.

Other contributions to books and Journals

(1) Recent progress and open problems in function field arithmetic – The influence of John Tate's work—- In special issue Vol. 6, No. 1 (2010), 1-20 (edited by L. Ji, S. T. Yau and J. K. Yu) of Pure and Applied Mathematics Quarterly honoring John Tate.

Reprinted in 'Wolf prize in Mathematics' Vol. 4, edited by Y. Sinai, E. Stein, 464-483 (2012).

(2) Approximation exponents in function fields — In "Analytic Number Theory — Essays in honour of Klaus Roth" edited by W. Chen, T. Gowers, H. Halberstam, W. Schmidt, R. C. Vaughn; pp. 421-435, Cambridge U. Press, 2009.

Expository articles not based on my research:

(i) (Jointly with V. Chari) On the work of V. G. Drinfeld - Current Science, Vol. 59, No. 24, (1990), 1297-1300.

(ii) Four expository articles: (i) Introduction, (ii) Quadratic and cyclotomic fields, (iii) Fermat's last theorem for regular primes, (iv) Overview and interconnections in 'Cyclotomic fields and related topics', Proceedings of the summer school (June 7-30, 1999), Edited by S. D. Adhikari, S. A. Katre and D. S. Thakur, Published by Bhaskaracharya Pratishthan, October 2000.

Non-math articles, not in the lists above

(1) 'Bhaikaka' (in Marathi), pub. 8 June 08, in Sunday literary supplement of Daily Loksatta.

Reprinted in Akshaydhara Diwali 2009, annual literary magazine.

Reprinted in the book 'Tujhiyaa Jaateechaa Milo Amhaa Koni', collection of articles published by Parachure Publishers, Mumbai (2011).

(2) 'Ganitaachaarya Shreeram Abhyankar' (in Marathi), pub. 21 June 2013, in Sunday literary supplement of Daily Loksatta.