

## Publications of Alexander Goncharov

### *Refereed journal articles.*

1. Goncharov, A., "Infinitesimal structures connected with Hermitian symmetric spaces," *Funct. Anal. Appl.*, **15**, n. 3, 83-84, 1981.
2. Goncharov, A., "A construction of Weil representations for some simple Lie algebras," *Funct. Anal. Appl.*, **16**, n. 3, 70-71, 1982.
3. Goncharov, A., "Generalized conformal structures," *Group Theory and Homological Algebra*, Yaroslavl State Univ. Press, 99-111, 1983.
4. Gelfand, I.M. and Goncharov, A. "On a characterization of Grassmannians," *Sov. Math. Dokl.* **34**, 189-193, 1987.
5. Gelfand, I.M. and Goncharov, A. "Reconstruction of a compactly supported function by its integrals over the lines intersecting a curve in the space" *Sov. Math. Dokl.* **34**, 373-376, 1987.
6. Vainstein, B.K. and Goncharov, A.B. "Determining the spatial orientation of arbitrarily arranged particles given their projections," *Dokl. Acad. Sci., USSR* **287**, n. 5, 1131-1134, 1986. English translation: Soviet Physics Doklady, Vol. 31, p.278.
7. Vainstein, B.K. and Goncharov, A.B. "Determining the spatial orientation of arbitrarily arranged particles given their projections," In: Proc. XIth International Congress on Electron Microscopy, Kyoto, Imura T, Mause S, Suzuki T. (eds) Japan Soc Electron Microscopy, Tokyo. pp 459-460 (1986).
8. Goncharov A.B., Vainshtein B.K., Ryskin A.I., Vagin, A.I.: SOV. Physics. - Crystallography. 32, 504 (1987)
9. Goncharov, A., "Generalized conformal structures on manifolds," *Selecta Mathematica Sovietica*, **6**, n. 4, 306-340, 1987.
10. Goncharov, A. B., "Methods of integral geometry and determination of mutual orientations of identical particles located in the plane from their projections onto a line" *Dokl. Acad. Sci., USSR*, **293**, n. 2, 355-358. 1987. English translation: Soviet Physics Doklady, Vol. 32.
11. Goncharov, A., "Integral geometry and 3-Dimensional reconstruction of randomly oriented particles from their electron micrographs," *Acta Applicandae Mathematicae*, **11**, 199-211, 1988.
12. Goncharov, A., "Methods of integral geometry and recovering a compactly supported function from its projections in unknown directions," *Acta Applicandae Mathematicae*, **11**, 213-222, 1988.
13. Goncharov, A., "Admissible families of k-dimensional submanifolds," *Soviet Math. Dokl.*, **300**, n. 3, 535-539, 1988.

14. Goncharov, A., "Integral geometry on surfaces in the space," *Geometry and Physics*, **4**, 571-594, 1989.
15. Goncharov, A., "Integral geometry on k-dimensional submanifolds," *Funct. Anal. Appl.*, **23**, n. **3**, 11-24, 1989.
16. Gelfand M.S., Goncharov, A., "Spatial rotational alignment of identical particles given their projections: theory and practice," *Mathematical Problems of Tomography*, 97 - 122, *Math. Monographs*, 81, AMS, Providence, RI, 1990.
17. Goncharov A.B., Gelfand M.S., "Determination of mutual orientation of identical particles from their projections by the moment method." *Ultramicroscopy* 25 (1988) 317-327.
18. Gelfand M.S., Goncharov A.B.: "Spatial rotational alignment of identical particles in the case of (almost) coaxial projections." *Ultramicroscopy*. 1989 Apr;27(3):301-6.
19. Goncharov, A., "Three-dimensional reconstruction of arbitrarily arranged identical particles given their projections," *Mathematical Problems of Tomography*, I.M.Gelfand, S.G.Gindikin, editors; in the Book: *Translations of Mathematical monographs*, **81**, American Mathematical Society, 67-96, 1990.
20. Goncharov, A., "Weil representation and hypergeometrical functions connected with Lagrangian Grassmannian," *Soviet Math. Dokl.*, **341**, n. **3**, 395-399, 1990.
21. Beilinson, A., Goncharov, A., Schechtman, V. and Varchenko, A., "Aomoto dilogarithm, mixed Hodge structures and motivic cohomology of pairs of triangles on the plane," in the Book: *The Grothendieck Festschrift*, Part of Series: *Progress in Mathematics*, **86**, Birkhauser, Boston, 131-172, 1990.
22. Beilinson, A., Goncharov, A., Schechtman, V. and Varchenko, A., "Projective geometry and algebraic K-theory," *Algebra and Analysis*, **6** n. **3**, 78-134, 1990.
23. Goncharov, A., "Integral geometry and subvarieties of minimal possible degree in  $CP^n$ ," *Funct. Anal. Appl.*, **24**, n. **1**, 5-20, 1990.
24. Goncharov, A., "The classical trilogarithm, algebraic K-theory of fields and Dedekind zeta functions," *Bull. of AMS*, **24**, n. **1**, 155-162, 1991.
25. Goncharov, A. "The classical polylogarithms, algebraic K-theory and  $\zeta_F(n)$ ," *Proc. of the Gelfand Seminar*, Birkhauser, 113-135, 1993.
26. Goncharov, A., "When a family of submanifolds is diffeomorphic to a family of planes," *Duke Math. Journal*, **71**, n. **1**, 317-331, 1993.
27. Goncharov, A., "Explicit construction of characteristic classes," *Advances in Soviet Mathematics*, **16**, Pt. **1**, (special volume dedicated to I.M.Gelfand's 80th birthday), 169 - 210, 1993.
28. Goncharov, A. "Admissible double bundles," In the Book: *'75 years of the Radon transform'*, Plenum Press, 1994.

29. Goncharov, A. "Polylogarithms and Motivic Galois groups," *Proceedings of the AMS Research Summer Conference "Motives", Symposium in Pure Mathematics*, **55**, 43 - 96, 1994.
30. Goncharov, A., "Geometry of configurations, polylogarithms and motivic cohomology," *Advances in Mathematics*, 1995, Vol. 114, No. 2, 1995, pp. 197-318.
31. Goncharov, A., "Chow polylogarithms and regulators," *Mathematical Research Letters*, **2**, n. **1**, 95-113. 1995.
32. Goncharov, A. "Integral geometry and D-modules". *Mathematical Research Letters*, 1995, vol 2, N 2, 415-435.
33. Goncharov, A. "Polylogarithms in arithmetic and geometry," *Proc. of Intern. Congr. of Mathematicians*, (Zürich, 1994), 1995, vol 1, 374-387.
34. Goncharov, A. "Deninger's conjecture on  $L$ -function of elliptic curve at  $s = 3$ ". Special volume dedicated to Manin's 60-th birthday (1997). 37 pages.
35. Goncharov, A. "Differential equations and Integral geometry". *Advances in Math.*, vol. 131, N2, (1997).
36. Goncharov, A., Levin A. "Zagier's conjecture on  $L(E, 2)$ ". *Inventiones Math.*, vol 132, (1998), 393-432.
37. Goncharov, A. "The double logarithm and Manin's complex for modular curves" *Mathematical Research Letters*, 1997, vol. 4, No 1, 1-20.
38. Goncharov, A. "Mixed elliptic motives" *Galois representations in Arithmetic Algebraic geometry*, (Durham 1996), London Math. Soc. Lecture Note Ser., vol. 254, Cambridge University Press, 1998. 147-221.
39. Goncharov, A., "Multiple polylogarithms, cyclotomy and modular complexes" *Mathematical Research Letters*, 1998, vol. 5, No 3, 497-516.
40. Goncharov, A., "Volumes of hyperbolic manifolds and mixed Tate motives", *Journal of Amer. Math. Soc.* vol. 12, (1999), N2, 569-618.
41. Goncharov, A. "Geometry of the trilogarithm and the motivic Lie algebra of a field". *Regulators in analysis, geometry and number theory*, 127-165, *Progr. Math.*, 171, Birkhauser Boston, Boston, MA, 2000
42. Goncharov, A. Zhao, J. "Grassmannian trilogarithms" *Compositio Math.* 127, (2001) N1, pp. 83-108.
43. Goncharov, A. "Explicit regulator maps on the polylogarithmic motivic complexes" In: *Motives, Polylogarithms and Hodge theory. Proceedings of the Irvine conference on Polylogarithms*, International Press Lecture Series 3, (2002). p. 245-277.
44. Goncharov, A. "The dihedral Lie algebras and Galois symmetries of  $\pi_1^l(P^1 \setminus \{0, \infty\} \cup \mu_N)$ ". *Duke Math. J.*, vol 100, N3, (2001), pp. 397-487. math.AG/0009121.

45. Goncharov, A. "Multiple  $\zeta$ -values, Galois groups, and geometry of modular varieties". European Congress of Mathematics, Vol. I (Barcelona, 2000), 361–392, Progr. Math., 201, Birkhauser, Basel. math.AG/0204102.
46. Goncharov, A., Manin Yu. I. "Multiple zeta-motives and moduli spaces  $M_{0,n}$ " Compositio Mathematica, 140 (2004), 1-14. math.AG/0204102.
47. Goncharov A. "Euclidean scissor congruence groups and mixed Tate motives over dual numbers" Math. Res. Letters, 11 (2004), vol. 6. 10001-10013. ArXiv: math.AG/0401354,
48. Goncharov, A. "Galois symmetries of fundamental groupoids and noncommutative geometry" Duke Math. J. 128 (2005), no. 2, 209–284.
49. Goncharov, A. "Polylogarithms, regulators and Arakelov motivic complexes" J. Amer. Math. Soc. 18 (2005), no. 1, 1–60.
50. Deligne P., Goncharov, A. "Groupes fondamentaux motiviques de Tate mixte" Ann. Sci. cole Norm. Sup. (4) 38 (2005), no. 1, 1–56.
51. Goncharov A. "Regulators" Algebraic K-theory handbook. Springer (2005), vol 1, 295-351. ArXiv: math.NT/0407308
52. Fock V., Goncharov A. "Moduli spaces of local systems and higher Teichmuller theory". Publications Mathematiques de l'IHES. v. 103 (2006) 1-211. ArXiv: math.AG/0311149.
53. Fock V., Goncharov A. "Cluster X-varieties, amalgamation and Poisson-Lie groups". Algebraic Geometry and Number Theory, In honor of Vladimir Drinfeld's 50th birthday, Birkhauser, (2006) Boston. 27-68. ArXiv: math.RT/0508408.
54. Gangl H., Goncharov A., Levin A.. "Multiple logarithms and trees". In: "Frontiers in Number Theory, Physics and Geometry" II: 759–774, Springer, Berlin, 2007.
55. Fock V., Goncharov A. "Convex projective structures on surfaces" Advances in Math. vol 208 (2007) 249-273. ArXiv: math.DG/0405348.
56. Fock V., Goncharov A. "Dual Teichmüller and lamination spaces". Handbook of Teichmuller theory. Volume 1. IRMA Lectures in Mathematics and Theoretical Physics 11. European Mathematical Society. 647-684. math.DG/0510312.
57. Goncharov A.B., "Pentagon relation for the quantum dilogarithm and quantized  $\mathcal{M}_{0,5}$ ". Progress in Mathematics, Vol 256, 413-426. (2007) Birkhauser Verlag Basel/Switzerland, arXiv:0706.4054.
58. Fock V., Goncharov A.B. "Cluster ensembles, quantization and the dilogarithm II. The intertwiner" Special volume dedicated to Yu. I. Manin's 70th birthday. Birkhauser Verlag Basel/Switzerland, (2008) 559-678, arXiv:math/0702398.
59. Goncharov A. "Euler complexes and geometry of modular varieties". Geometric Analysis and Functional Analysis. Geometry and Functional Analysis. Vol 12, (2007) 1873-1914. ArXiv: math.NT/0510310.

60. Gangl H., Goncharov A., Levin A.. “Multiple polylogarithms, polygons, trees and algebraic cycles”. Proceedings of the Seattle conference on Algebraic geometry. Proceedings of Symposia in Pure Mathematics. Volume 80, Part 2, 547-594.
61. Fock V., Goncharov, A. “The quantum dilogarithm and representations of quantum cluster varieties”. *Inventiones Mathematicae*. 175, 223-286 (2009).
62. Fock V., Goncharov A. “Cluster ensembles, quantization and the dilogarithm” *Annales Scientifiques L’Ecole Normal Superier*, 2009. 58 pages. ArXiv: math.AG/0311245.
63. Goncharov A. “Hodge Correlators II”. *Moscow Mathematics Journal*. Special issue dedicated to P. Deligne. 2010. 49 pages. arXiv:0807.4855.
64. “Classical Polylogarithms for Amplitudes and Wilson Loops” Alexander B. Goncharov, Marcus Spradlin, C. Vergu, Anastasia Volovich: 11 pages, *Phys.Rev.Lett.*105:151605, 2010, arXiv:1006.5703
65. Fock V.V., Goncharov A.B.: “Cluster  $\mathcal{X}$ -varieties at infinity”. *Moscow Math Journal*. To appear. 21 pages. arXiv:1104.0407.
66. Goncharov, A.B., Kenyon R.: “Dimers and cluster integrable systems”. *Annales Scientifiques L’Ecole Normal Superier*, 2013, arXiv:1107.5588. 78 pages.
67. Goncharov A.B.: “ A simple construction of Grassmannian polylogarithms”. arXiv:0908.2238. 26 pages, *Advances in Mathematics*, April 2013.

*Papers submitted to journals – also available in the ArXive.*

68. Goncharov A.B.: “Hodge correlators” arXiv:0803.0297. 114 pages. Submitted.
69. Goncharov, A.B.: “Hidden Hodge symmetries and Hodge correlators”. 9 pages *Proceedings of the Arbeitstagung*. MPI Bonn June 2011. arXiv:1107.5710. 9 pages,
70. Arkani-Hamed N., Bourjaily J., Cachazo F., Goncharov A.B., Postnikov A., Trnka J.: “Scattering Amplitudes and the Positive Grassmannian” arXiv:1212.5605 154 pages, Submitted.
71. Dimofte T., Gabella M., Goncharov A. B.: “K-Decompositions and 3d Gauge Theories”, arXiv:1301.0192, 134 pages. arXiv:1305.1617
72. Golden J., Goncharov A.B., Spradlin M., Vergu C., Volovich A.: *Motivic Amplitudes and Cluster Coordinates*. 61 pages, arXiv:1305.1617
73. Goncharov, A.B., Shen L.: *Geometry of canonical bases and mirror symmetry*. 110 pages. ArXive arXiv:1309.5922  
*Preprints available in the ArXive.*
74. Goncharov, A. “Periods and mixed Tate motives” arXiv:math.AG/0202154, 103 pages.

75. Goncharov, A. "Multiple polylogarithms and mixed Tate motives" arXiv:math/0103059, 87 pages.