

LIST OF PAPERS BY NÁNDOR SIMÁNYI

January, 2025

1. Algebraic Invariants in the Theory of Shape, *Matematikai Lapok*, **30**, No. 1-3. (1978-1982), pp. 135-153. (In Hungarian.)
2. Random walks with internal states and the Fourier law of heat conduction, *Proc. of the American-Hungarian Workshop on Multivariate Analysis*, Stanford, (1984), 28-31. (Jointly with A. Krámli and D. Szász.)
3. Random walks with internal degrees of freedom. III. Stationary probabilities, *Probab. Th. Rel. Fields.* **72** (1986), 603-617. (Jointly with A. Krámli and D. Szász.)
4. Heat conduction in caricature models of the Lorentz gas, *J. of Statistical Physics*, **46** (1987), 303-318. (Jointly with A. Krámli and D. Szász.)
5. Two-particle billiard system with arbitrary mass ratio, *Ergodic theory and dynamical systems*, Vol. **9** (1989), 165-171. (Jointly with M. P. Wojtkowski.)
6. Towards a proof of recurrence for the Lorentz process, *Banach Center Publications*, Volume **23**, Dynamical Systems and Ergodic Theory, pp. 265-276 (1989).
7. Dispersing billiards without focal points on surfaces are ergodic, *Commun. Math. Phys.* **125**, 439-457 (1989). (Jointly with A. Krámli and D. Szász.)
8. Ergodic properties of semi-dispersing billiards. I. Two cylindric scatterers in the 3-D torus, *Nonlinearity*, **2** (1989), pp. 311-326. (Jointly with A. Krámli and D. Szász.)
9. The K-property of three billiard balls, *Annals of Mathematics*, **133** (1991), 37-72. (Jointly with A. Krámli and D. Szász.)
10. A 'Transversal' Fundamental Theorem for Semi-Dispersing Billiards, *Commun. Math. Phys.* **129**, 535-560 (1990). (Jointly with A. Krámli and D. Szász.)
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14. The K-Property of N Billiard Balls II. Computation of Neutral Linear Spaces, *Inventiones Mathematicae* **110**, 151-172 (1992).
15. The K-Property of 4-D Billiards with Non-Orthogonal Cylindric Scatterers, *Journal of Statistical Physics*, Vol. **76**, Nos. 1/2, 587-604 (1994). (Jointly with D. Szász.)
16. The Boltzmann-Sinai Ergodic Hypothesis for Hard Ball Systems, *Workshop on Dynamical Systems and Related Topics. 1994 Meetings University of Maryland & Penn State*. Abstract of Talks, 1994.
17. The K-Property of Hamiltonian Systems with Restricted Hard Ball Interactions, *Mathematical Research Letters*, **2**, No. 6, 751-770, (1995). (Jointly with D. Szász.)
18. The Ergodicity of Sinai's Pencase Model, *Workshop on Dynamical Systems and Related Topics. 1995 Meetings University of Maryland & Penn State*. Abstract of Talks, 1995.
19. Ball-avoiding theorems, *Ergodic Theory and Dynamical Systems Abstracts*, eds. K. Baranski, F. Przytycki. Stefan Banach International Mathematical Center 1995.

20. The Characteristic Exponents of the Falling Ball Model, *Communications in Mathematical Physics* **182**, 457-468 (1996).
21. Studying Dynamical Systems With Algebraic Tools, *Progress in Mathematics*, Vol. **169**, pp. 200–210. Birkhäuser Verlag, 1998.
22. Rotation-symmetric Surfaces of Soap Film and the Theorem of Charles Delaunay. *Century 2 of KöMaL* (Published by the Roland Eötvös Physical Society), Vol. **2**, pp. 181–190. (Jointly with Péter Gnädig.)
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24. Hard Ball Systems Are Completely Hyperbolic, *Annals of Mathematics*, **149**, No. **1**, 35–96 (1999), arXiv:math.DS/9704229 (Jointly with D. Szász.)
25. Ergodicity of Hard Spheres in a Box, *Ergodic Theory and Dynamical Systems* Vol. **19** (1999), 741–766.
26. Non-integrability of Cylindric Billiards and Transitive Lie Group Actions. *Ergodic Theory and Dynamical Systems*, Vol. **20** (2000), 593-610. (Jointly with D. Szász)
27. Hard Ball Systems and Semi-Dispersive Billiards: Hyperbolicity and Ergodicity. *Encyclopedia of Mathematical Sciences*, Vol. **101**, Mathematical Physics II. Edited by D. Szász, Springer Verlag 2000, pp. 51–88.
28. The Complete Hyperbolicity of Cylindric Billiards. *Ergodic theory and dynamical systems*, Vol. **22** (2002), 281–302. arXiv:math.DS/9906139
29. Proof of the Boltzmann–Sinai Ergodic Hypothesis for Typical Hard Disk Systems. *Inventiones Mathematicae*, Vol. **154** (2003), No. **1**, pp. 123-178. arXiv:math.DS/0008241
30. Proving The Ergodic Hypothesis for Billiards With Disjoint Cylindric Scatterers. *Nonlinearity*, Vol. **17** (2004), pp. 1-21. arXiv:math.DS/0207223
31. Proof of the Ergodic Hypothesis for Typical Hard Ball Systems. *Annales Henri Poincaré* **5** (2004), pp. 203–233. arXiv:math.DS/0210280
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36. Upgrading Local Ergodic Theorem for planar semi-dispersing billiards (Jointly with N. Chernov.) *J. Stat. Phys.*, **139** No. **3** (2010), 355-366. DOI: 10.1007/s10955-010-9927-6
37. Conditional Proof of the Boltzmann-Sinai Ergodic Hypothesis. *Inventiones Mathematicae*, Vol. **177**, No. **2** (August 2009), pp. 381–413, DOI: 10.1007/s00222-009-0182-x
38. Sums of squares and orthogonal integral vectors. *Journal of Number Theory* Vol. **132**, Issue 1, January 2012, Pages 37-53. (Joint work with Lee M. Goswick, Emil W. Kiss, and Gábor Moussong) <http://dx.doi.org/10.1016/j.jnt.2011.07.001>

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40. G. Moussong, N. Simányi, Circle decompositions of surfaces, *Topology and its Applications* 158 (2011) 392396. doi:10.1016/j.topol.2010.11.015
41. N. Chernov, A. Korepanov, N. Simanyi, Stable regimes for hard disks in a channel with twisting walls, *Chaos* Vol.22, Issue 2, June 2012.
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43. Matthew P. Clay, Nándor J. Simányi, Rényi's Parking Problem Revisited, *Stochastics and Dynamics*, Vol. **16**, No. **2** (2016). DOI: 10.1142/S0219493716600066
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45. Caleb C. Moxley, Nandor J. Simanyi Homotopical complexity of a 3D billiard flow, in Dynamical Systems, Ergodic Theory, and Probability: in Memory of Kolya Chernov, Contemporary Mathematics, vol. 698, Amer. Math. Soc., Providence, RI, 2017, pp. 169-180. <http://dx.doi.org/10.1090/conm/698/13981>
46. Caleb C. Moxley, Nándor Simányi, Homotopical complexity of a billiard flow on the 3D flat torus with two cylindrical obstacles, *Ergodic Theory and Dynamical Systems*, Vol. **39**, No. **4**, April 2019, pp. 1071-1081. DOI: <https://doi.org/10.1017/etds.2017.62>
47. Nándor Simányi, Conditional Proof of the Ergodic Conjecture for Falling Ball Systems, *Contemporary Mathematics*, Volume **797**, 2024 pp. 75-83. DOI: <https://doi.org/10.1090/conm/797/15935>
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49. Nándor Simányi, Asymptotic Homotopical Complexity of an Infinite Sequence of Dispersing 2D Billiards, <https://doi.org/10.48550/arXiv.2501.16284>