Rade T. Živaljević
Mathematical Institute SASA, Belgrade
Scientific Biography

1 Education

Rade Živaljević was born on October 12, 1954 in Sarajevo. Master thesis (M.Sci) and Ph.D. degree thesis were defended at Belgrade University in 1979, respectively 1983. The second Ph.D. degree thesis was defended at the University of Wisconsin-Madison in 1985. He has been a member of the Mathematical Institute of the Serbian Academy of Sciences and Arts (SASA) since 1977, where he was appointed as a full research professor in 1995.

2 Scientific Activities

2.1 Selected visits

Visiting associate professor at the University of Illinois at Urbana-Champaign in 1994; Mittag-Leffler institute (Stockholm, Year of Combinatorics, 1991); Konrad Zuse Zentrum für Informationstechnik (ZIB), Berlin, 1994); Mathematical Institute Bern (1999). Shorter periods at Institut des Heutes Études (Paris), Mathematical Sciences Research Institute, Berkeley (2006, 1998, 1991), Moscow State University (MGU), Mathematics Forschungs Institut (Oberwolfach), Givat-Ram (Jerusalem), Technion (Haifa), KTH Stockholm, SISSA (Trieste), etc. The most recent visits include Moscow State University (April 2016), "Reseach in Pairs" program (Mathematisches Forschungsinstitut Oberwolfach, May 2016), Brown University (Institute for Computational and Experimental Research in Mathematics (ICERM), program "Topology in Motion", Fall 2016), Saint Petersburg State University (June, 2018), Research in pairs, Centre International de Rencontres Mathématiques (CIRM, Marseille), fall 2018, "Reseach in Pairs" program (Mathematisches Forschungsinstitut Oberwolfach, 2019). Research in residence, September 2022, Centre International de Recontres Mathematiques (CIRM), Marseille, France, `https://www.cirm-math.com/`. Mathematisches Forschungsinstitut Oberwolfach, February 2024, `https://opc.mfo.de/person_detail?id=15284`

2.2 Conferences

Selected lectures and addresses include the following:
Seminar "Geometry, Topology and Mathematical Physics", Steklov Mathematical Institute of RAS, October 12, 2022, Moscow, http://www.mathnet.ru/php/seminars.phtml?option_lang=eng&presentid=36178. International School "Toric topology, combinatorics and data analysis", Oct. 03–09, 2022, Leonhard Euler International Mathematical Institute in Saint Petersburg. https://cs.hse.ru/en/ata-lab/ttcda/. Classical and Contemporary Geometry, Moscow 1-4. 11. 2021, Geometric Topology and Hypergraphs MOCCA 2021 mini symposiym, Moscow, MIPT June 1, 2021. "Toric Topology 2019 in Okayama", Okayama (Japan) Fall 2019

(invited lecture), "Algebraic Topology, Combinatorics and Mathematical Physics" in honor of Victor Buchstaber on the occasion of his 75th birthday. Steklov Mathematical Institute of the Russian Academy of Sciences and Skolkovo Institute of Science and Technology (SkolTech), Moscow, 24—30 May 2018 (plenary lecture). Steklov Mathematical Institute RAS (St. Petersburg, 6.6.2018). Chebishev Laboratory of St. Petersburg State University (June 2018), Applied Topology in Bedlewo 2017 25 June 2017 - 1 July 2017, Bedlewo (Poland). Princeton Algebraic Topology Seminar (October 2016), M.I.T. Topology Seminar (October, 2016), 19 Geometric Seminar (Zlatibor, August 2016), Seminar Discrete and Computational Geometry (Moscow, MIPT, April 2016), The Fifth German-Russian Week of the Young Researcher on Discrete Geometry, MIPT Moscow, 6-11 September 2015; Summer school on computational topology (Ljubljana 2015), Geometric and Algebraic Combinatorics, Oberwolfach 2015; Applied Algebraic Topology, Castro Urdiales 2014, Geometry, Topology, Integrability, Moscow (Skolkovo) 2014; Applied Topology Bedlewo 2013, Algebraic Topology and Abelian Functions - Moscow, 2013; Geometry, Topology, Algebra and Number Theory, Moscow (Steklov Inst.), 2010; Gil Kalai i R. Živaljević are organizers of the conference Combinatorics and Topology, Jerusalem, June 19 - June 22, 2007; Technical University Berlin and Free University Berlin, colloquium speaker (December 2005); Algebraic and Geometric Combinatorics, Anogia, Greece (August 2005); Combinatorics Symposium in honor of Helge Tverberg, Bergen (March 2005), Trends in Topological Combinatorics, KTH Stockholm (February 2005); 18 British Topology Symposium, Manchester (September 2003), Workshop on Topological Methods in Combinatorics, KTH Stockholm, May 31 - June 2, 2006, etc.

2.3 National and international projects

R. Živaljević is (together with Vladimir Dragović) the founder of the center "Dynamical Systems, Geometry and Combinatorics'), as a research unit (center of excellence) in Mathematical Institute SASA (Belgrade) `http://www.mi.sanu.ac.yu/dsgc/dsgc.htm`. Center is or was in the past the coordinator of international cooperation with other groups with similar orientation from the following institutions, Steklov Institute in Moscow (V. Kozlov, V. Buchštaber); Mathematical Physics Sector, SISSA - ISAS, Trieste (B. A. Dubrovin); Discrete Geometry Group, TU Berlin (G. Ziegler); DIMATIA, Prague, Czech Republic (J. Matoušek), as well as the regional groups (Banja Luka, Podgorica, Zagreb, Niš, itd.).
R. Živaljević was the coordinator, together with Petar Pavešić (Univ. of Ljubljana, Slovenia), of the Serbia-Slovenia bilateral project "Applied and Computational Algebraic Topology" (2016-2017).

2.4 Awards and honors

R. Živaljević was in 1995 awarded (together with Siniša Vrećica) the City of Belgrade Award for the solution of the "Colored Tverberg Problem". This award was at the time in Serbia the highest award for scientific research and other achievements.

2.5 Students

R.Živaljević was the PhD degree thesis adviser (University of Belgrade) of Pavle Blagojević, Vladimir Grujić, Djordje Baralić, Žana Kovijanić, Manuela Muzika-Dizdarević, Marinko Timotijević and a co-adviser of Duško Jojić. He was a internship adviser of Stephan Hell (Technische Universität Berlin 2006) and Leandro Vicente Mauri (Sao Paulo, 2022).

3 Research

3.1 Research interests

Rade Živaljević is the author of more than 80 research papers and numerous review and expository publications. Among the research publications are papers published in highly ranked international mathematical journals which include *Advances in Mathematics, Mathematische Annalen, J. Reine Angew. Math., Trans. Amer. Math. Soc., J. London Math. Soc., Combinatorica*, etc. The main contributions of Rade Živaljević are in the areas of topological and geometric combinatorics, discrete and computational geometry, applied algebraic topology.

3.2 Selected results

The main contributions may be classified in three thematic circles: Homotopy colimits and Ziegler-Živaljević-formulae; "Configuration space-test map"-scheme with applications in computational topology; Homotopic and cohomological methods in topological combinatorics.

(1) Solution of the problem (possed by Victor Vassiliev, Berkeley 1997) of describing the geometric resolutions $exp_n(S^m)$ of spheres (*Advances in Applied Mathematics*, 1998).

(2) The Csorba-Živaljević universality theorem for Lovász graph complexes (Journal of Combinatorial Theory, Ser A, 2005).

(3) The problem (Branko Grünbaum, 1960) of equipartitions of measures in the 4-dimensional euclidean space (Transactions of the American Mathematical Society, 2008).

(4) Multidimensional ,,Splitting necklace"-theorem (Advances in Mathematics, 2008) as an extension of the one dimensional case (Noga Alon, 1987).

(5) Combinatorial techniques for the study of symmetric cohomology of algebras and a solution of a problem of Ault and Fiedorowicz-a (*European Journal of Combinatorics*, 2009, coauthor S. Vrećica).

(6) Differential and algebraic topology of "totally skew embeddings" (Transactions Amer. Math. Society 2011, coauthors S. Vrećica, B. Prvulović, G. Stojanović, and Dj. Baralić).

(7) "Center Transversal Theorem" (Bulletin London Math. Society 1990, coauthor S. Vrećica).

(8) Ziegler–Zivaljevic formulae, Mathematische Annalen 1993, J. Reine Angew. Math., 1999.

(9) Work on the colored Tverberg problem and chessboard complexes, J. Combin. Theory, Ser. A (1992 and 2011), J. London Math. Soc. 1994.

(10) Resolution (together with D. Jojić and S. Vrećica, *J. Algebraic Combin.*, 46 (2017)) of the conjecture of Blagojević, Frick, and Ziegler about the existence of 'balanced Tverberg partitions' (Conjecture 6.6 in, Tverberg plus constraints, Bull. London Math. Soc. 46 (2014)).

4 Publications

4.1 Five papers with the largest number of citations (May 2026)

[1] R. Živaljević, S. Vrećica, The colored Tverberg's problem and complexes of injective functions, *J. Combin. Theory, Ser. A* 61 (2), 1992, 309–318. *Google Scholar = 205*

[2] G. Ziegler, R. Živaljević, Homotopy types of subspace arrangements via diagrams of spaces, *Mathematische Annalen, 295:527–548, 1993.* *Google Scholar = 173*

[3] A. Björner, L. Lovász, S. Vrećica, and R. Živaljević, Chessboard and matching complexes, *J. London Math. Soc.* (2), 49:25–39, 1994. *Google Scholar = 175*

[4] V. Welker, G. Ziegler, R. Živaljević, Homotopy colimits – comparison lemmas for combinatorial applications , *J. Reine Angew. Math.*, 509 (1999), 117–149. *Google Scholar = 145*

[5] R. Živaljević, Topological methods, poglavlje 11 u *CRC Handbook of Discrete and Computational Geometry,* J.E. Goodman, J. O'Rourke eds., CRC press, New York 1997. *Google Scholar = 93+34*

4.2 Main publications before 2003

[6] R. Živaljević, $md(H) = md(\bar{H})$, *Publ. Inst. Math. Belgrade, 26(40), pp. 308–311, 1979.*

[7] R. Živaljević, Note on H-convex functions, *Publ. Inst. Math. Belgrade, 26(40), pp. 313–317, 1979.*

[8] R. Živaljević, Two examples of Q-topologies, *Publ. Inst. Math. Belgrade, 35(49).*

[9] R. Živaljević, The notions of w-net and Y-compact space viewed under infinitesimal microscope, *Publ. Inst. Math. Belgrade, 34(48).*

[10] R. Živaljević, A Loeb measure approach to the Riesz representation theorem, *Publ. Inst. Math. Belgrade, 32(46), pp. 175–177.*

[11] M.M. Marjanović, S.T. Vrećica, R.T. Živaljević, Some properties of hyperspaces of higher rank, *Bull. Acad. Serbe des Sciences et des Arts, LXXXIV, 1984.*

[12] M. Rašković, R. Živaljević, Barwise completeness for some biprobability logics, *Zeitschrift für Mathematische Logik und Grundlagen der Mathematik, band 32/2, 1986, 133-135.*

[13] R. Živaljević, Loeb completion of vector valued measures, *Mathematica Scandinavica, 56 (1985), pp. 276–286.*

[14] R. Živaljević, Infinitesimals, microsimplexes and elementary homology theory, *Amer. Math. Monthly, Sept. 1987.*

[15] R. Živaljević, On a cohomology theory based on hyperfinite sums of microsimplexes, *Pacific J. Math., vol. 128, no.1, 1987.*

[16] R. Živaljević, A reversed Kakutani's fixed point theorem, *Publ. Inst. Math., 44(58), 1989.*

[17] R. Živaljević, Extremal Minkowski additive selections of compact convex sets, *Proc. Amer. Math. Soc., vol. 105, no.1, 1989.*

[18] R. Živaljević, S. Vrećica An extension of the ham sandwich theorem, *Bull. London Math. Soc. vol. 22, 1990, pp. 183–186.*

[19] A. Vučić, R. Živaljević, Dihedral hyperhomology of a chain algebra with involution, *Publications de l'Institut Mathematique (Beograd), 49(63), 1991.*

[20] S. Vrećica, R. Živaljević, The ham sandwich theorem revisited, *Israel J. Math.* 78, 1992, pp. 21–32.

[21] N. Bokan, P. Gilkey, R. Živaljević, An inhomogeneous elliptic complex, *Journal d'Analyse Mathematique, vol. 61, 1993, pp. 367–393.*

[22] A. Vučić, R. Živaljević, Note on a conjecture of Sierksma, *Discrete and computational geometry, vol. 9, pp. 339–349, 1993.*

[23] S. Vrećica, R. Živaljević, New cases of the colored Tverberg theorem, Jerusalem Combinatorics '93, H. Barcelo, G. Kalai (eds.) *Contemporary mathematics,* A.M.S. Providence 1994.

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[25] R. Živaljević, Colored Caratheodory-Barany theorems, *Publications de l'Institut Mathematique (Beograd), 49(63), 1996.*

[26] R.T.Živaljević. User's guide to equivariant methods in combinatorics *Publ. Inst. Math. Belgrade*, 59 (73), 1996, 114-130.

[27] R. Živaljević, User's guide to equivariant methods in combinatorics II, *Publications de l'Institut Mathematique (Beograd), 64(78), 1998.*

[28] R. Živaljević, Combinatorics of Topological posets. Homotopy complementation formulas, *Advances in Applied Mathematics* 21, 547-574 (1998).

[29] R. Živaljević, The Tverberg-Vrećica problem and the combinatorial geometry on vector bundles, *Israel J. Math.*, 111 (1999), 53–76.

[30] E. Makai, S. Vrećica, R. Živaljević, Plane sections of convex bodies of maximal volume, *Discrete Comput. Geometry* 25, 2001, 33-49.

[31] S.T. Vrećica, R.T. Živaljević, Conical equipartitions of mass distributions, *Discrete Comput. Geom.* 25:339–350 (2001).

[32] R.T. Živaljević, An essay about geometric combinatorics. *Bull. Soc. Math. Banja Luka* 9 (2002), 80–93 (2004). MR2059554 (2005m:52015)

[33] P. Blagojević, V. Grujić, R. Živaljević, *Symmetric products of surfaces; a unifying theme for topology and physics*, in Summer school in modern mathematical physics, Sokobanja 2001, SFIN, XV (A3), Belgrade 2002, 466–491.

4.3 Main publications after 2003

[34] S.T. Vrećica, R.T. Živaljević, Arrangements, equivariant maps and partitions by k-fans, in B. Aronov, S. Basu, J. Pach, M. Sharir, eds, *Discrete and Computational Geometry - The Goodman-Pollack Festschrift*, Algorithms and Combinatorics, volume 25, Springer Verlag, Berlin, 2003.

[35] P. Blagojević, V. Grujić, R. Živaljević. Symmetric products of surfaces and the cycle index. Israel J. Math. 138 (2003) 61–72.

[36] R.T. Živaljević, Topological methods, Chapter 14 in *Handbook of Discrete and Computational Geometry*, J.E. Goodman, J. O'Rourke, eds, Chapman & Hall/CRC 2004.

[37] P. Blagojević, V. Grujić, R. Živaljević, Arrangements of symmetric products of spaces, *Topology and its Applications* 148 (2005) 213 – 232.

[38] R.T. Živaljević, WI-posets, graph complexes and $\mathbb{Z}_2$-equivalences, *J. Combin. Theory, Ser. A*, 111 (2005) 204-223.

[39] P. Mani–Levitska, S. Vrećica, R. Živaljević, *Topology and Combinatorics of Partitions of Masses by Hyperplanes*, Advances in Mathematics 207 (2006) 266–296.

[40] R. Živaljević, *Groupoids in combinatorics – applications of a theory of local symmetries*, Proceedings of the Conference "Algebraic and Geometric Combinatorics", Anogia, Greece 2005, Contemporary mathematics A.M.S. 2007; Vol. 423, 305–324.

[41] R.T. Živaljević, Equipartitions of measures in $\mathbb{R}^4$, *Trans. Amer. Math. Soc.* Volume 360, Number 1, January 2008, pp. 153–169.

[42] M. de Longueville, R.T. Živaljevic, Splitting multidimensional necklaces, *Advances in Mathematics*, 2008, DOI: 10.1016/j.aim.2008.02.003.

[43] Pavle V. M. Blagojević, Sinisa T. Vrećica, Rade T. Živaljević, Computational topology of equivariant maps from spheres to complements of arrangements, *Trans. Amer. Math. Soc.* 361 (2009), 1007-1038.

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[48] S. Vrećica, R. Živaljević, Chessboard complexes indomitable, Journal of Combinatorial Theory Series A, (2011), vol. 118 br. 7, str. 2157–2166. **M21**

[49] Dj. Baralić , B. Prvulović , G. Stojanović , S. Vrećica, R. Živaljević, Topological obstructions to totally skew embeddings. *Trans. Amer. Math. Soc.*, (2012), Vol. 364, 2213–2226. **M21a**

[50] R. Živaljević, Rotation number of a unimodular cycle: an elementary approach, *Discrete Mathematics* (2013), vol. 313, 2253–2261.

[51] Rade T. Živaljević: Review of the book *Mathematical Omnibus: Thirty Lectures on Classic Mathematics.* Am. Math. Mon. 120(3): 283–286 (2013).

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[53] R. Živaljević, Computational Topology of Equipartitions by Hyperplanes, Topological Methods in Nonlinear Analysis, (2015), vol. 45, 63–90. **M21**

[54] R. Živaljević, Illumination complexes, Delta-zonotopes, and the polyhedral curtain theorem, Computational geometry-theory and applications, (2015), 225–236. **M22**

[55] S. Vrećica, R. Živaljević. Measurable Patterns, Necklaces and Sets Indiscernible by Measure. Topological Methods in Nonlinear Analysis, (2015), vol. 45 br. 1, 39–53. **M21**

[56] M. Muzika-Dizdarević, R. Živaljević. Signed Polyomino Tilings By n-in-Line Polyominoes and Grb̈ner Bases, *Publ. Inst. Math. (Beograd) (N.S.)* 99 (113) (2016), 31–42. **M23** (2014)

[57] R.T. Živaljević. A glimpse into continuous combinatorics of posets, polytopes, and matroids, Fundam. Prikl. Mat., 2016, Volume 21, Issue 6, 143–164. (transl.) Journal of Mathematical Sciences (Springer), `http://www.mathnet.ru/php/journal.phtml?jrnid=fpm&option_lang=rus` **M24**

[58] D. Jojić, S.T. Vrećica, R.T. Živaljević. Multiple chessboard complexes and the colored Tverberg problem. *J. Combin. Theory Ser. A*, 145 (2017), 400–425. **M21**

[59] Dj. Baralić, R. Živaljević. Colorful versions of the Lebesgue, KKM, and Hex theorem, *J. Combin. Theory Ser. A*, 146 (2017), 295–211. **M21**

[60] D. Jojić, S.T. Vrećica, R.T. Živaljević. Symmetric multiple chessboard complexes and a new theorem of Tverberg type. *J. Algebraic Combin.*, 46 (2017), 15–31. **M21**

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[65] F. D. Jevtić, M. Timotijević, R.T. Živaljević. Polytopal Bier spheres and Kantorovich-Rubinstein polytopes of weighted cycles, *Discrete and Computational Geometry*, Online published 2019–11–19.

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[67] D. Jojić, G. Panina, R. Živaljevic. A Tverberg type theorem for collectively unavoidable complexes. *Israel J. Math.*, accepted (November 21, 2019).

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[72] D. Jojić, G. Panina, R. Živaljević, Optimal colored Tverberg theorems for prime powers,*Homology, Homotopy and Applications*, accepted 2021. **M23**

[73] D. Jojić, G. Panina, R. Živaljević, Splitting necklaces with constraints, SIAM J. Discrete Math. 2021. **M23**

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[84] I. Yu. Limonchenko, M. Timotijević, R. T. Živaljević, *On a class of toric manifolds arising from simplicial complexes*; preprint (2025); arXiv:2506.13547.

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4.4 International visibility (citations, ranking, etc.)

(1) Personal page at Math-Net.Ru

http://www.mathnet.ru/php/person.phtml?option_lang=eng&personid=80903

https://www.mathnet.ru/rus/person80903

(2) List of publications on ZentralBlatt

https://zbmath.org/authors/?q=au%3A%22zivaljevic%2C%20r%2A%22%20%7C%20au%3A%22zivaljevic%2C%20r%2A%20t%2A%22

(3) List of publications on Google Scholar (July 2024)

https://scholar.google.com/citations?user=8WbnmmwAAAAJ&hl=en

	All Citations	Since 2021
Citations	1998	490
h-index	22	10
i10-index	42	16