Đorđe Baralić

Mathematical Institute SANU
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Citizenship: Republic of Serbia
Date of birth: 29th of September, 1986

Employment

2021-present **Deputy Director** of the Mathematical Institute SANU
2020- present **Research Associate Professor**, Mathematical Institute SANU
2014-2020 Research Assistant Professor, Mathematical Institute SANU
2008-2014 Research Assistant, Mathematical Institute SANU

Education

2008-2013 PhD in Mathematics, University of Belgrade, Serbia
PhD thesis 'Topology and Combinatorics of Quasitoric Manifolds and the Polyhedral Product Functors', PhD thesis adviser, Rade Živaljević
2005-2005 BSc and MSc in Mathematics, University of Kragujevac, Serbia

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Research Interests

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toric topology, geometric combinatorics, combinatorial algebraic geometry, geometric topology, theory of polytopes, algebraic topology

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Teaching Experience

2008-present Mathematical Grammar School, Belgrade, Serbia
2007-2011 the leader of Junior Balkan Mathematical Olympiad team of Serbia

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Mentoring of PhD students

2016-2022 Edin Liđan, 'Topological characteristics of polyomino tilings', University of Montenegro, Podgorica, Montenegro

2016-2020 Marina Milićević, 'Formal systems for proving incidence results', University of Novi Sad, Serbia (coadvisor)

Publications

Research papers

1. Dj. Baralić and L. Milenković: *Small covers and quasitoric manifolds over neighborly polytopes*, accepted for publications at Mediterranean Journal of Mathematics

2. E. Liđan and Dj. Baralić: *Homology of polyomino tilings on flat surfaces*, published online in Applicable Analysis and Discrete Mathematics

3. Dj. Baralić and V. Limić: *The law of large numbers for the bigraded Betti numbers of a random simplicial complex*, Russian Mathematical Surveys, (2021) 76(1) 186-189 (M21a)

4. Dj. Baralić, J. Grbić, I. Limonchenko and A. Vucić: *Toric Objects Associated with the Dodecahedron*, Filomat, (2020) 34(7) 2329-2356

5. Dj. Baralić, P.L. Currien, M. Milicević, J. Obradovic, Z. Petric, M. Zekić and R. Živaljević: *Proofs and surfaces*, Annals of Pure and Applied Logic, (2020) 171(9) 102845

6. Dj. Baralić, J. Ivanović and Z. Petrić: *A simple permutoassociahedron*, Discrete Mathematics, (2019) 342(12) 111591

7. Dj. Baralić, P. Blagojević, R. Karasev and A. Vucic: *Index of Grassmann manifolds and orthogonal shadows*, Forum Mathematicum, (2020) 30(6) 1539-1572

8. Dj. Baralić, S. Telebaković and Z. Petrić: *Spheres as Frobenius Objects*, Theory and Applications of Categories, (2018) 33 691-726

9. Dj. Baralić: *On Integers Occurring as the Mapping Degree between Quasitoric 4-manifolds*, Journal of the Australian Mathematical Society, Volume 103 (2017), Number 3, 289-312

10. Dj. Baralić, D. Jokanović and M. Milićević: *Variations on Steiner Porism*, The Mathematical Intelligencer, Volume **39** (2017), Issue 1, 6-11.

11. Dj. Baralić and R. Živaljević: *Colorful versions of the Lebesgue and KKM theorem*, Journal of Combinatorial Theory, Series A, Volume **146** (2017), 295-311.

12. Dj. Baralić and V. Grujić: *Quasitoric manifolds and small covers over regular colored polytopes: embeddings and immersions*, Sbornik Mathematics, Volume 207 (2016), Number 4, 3-14

13. Dj. Baralić and I. Lazăr, *A note on the combinatorial structure of finite and locally finite simplicial complexes of nonpositive curvature*, Bulletin Mathematique de la Societe des Sciences Mathematiques de Roumanie, (2016) 59(3) 205-216

14. Dj. Baralić and I. Spasojević: *Illumination of Pascal's Hexagrammum and Octagrammum Mysticum*, Discrete & Computational Geometry, Volume **53** (2015), Issue 2, pp 414-427.

15. Dj. Baralić: *A Short Proof of the Bradley Theorem*, American Mathematical Monthly, Volume **122** (2015), No. 4, pp 381-385.

16. Dj. Baralić: *Immersions and Embeddings of Quasitoric Manifolds over Cube*, Publications de l'Institut Mathematique (N.S.) 95 (2014), 63-71

17. Dj. Baralić, B. Grbić and Dj. Žikelić: *Theorems about Quadrilateral and Conics*, International Journal of Computer Mathematics (2014) **91** (7), 1407-1421.

18. Dj. Baralić, B. Prvulović, G. Stojanović, S. Vrećica and R. Živaljević: *Topological Obstructions to Totally Skew Embeddings*, Transactions of American Mathematical Society, (2012), vol. **364** no. **4**, 2213-2226.

Books

1. Dj. Baralić: *300 Training Problems for Junior Mathematical Olympiads - The Experience of Serbia (book in Serbian)*, Matica Srpska - Society of Members in Montenegro, Podgorica, Montenegro, 2012.

Projects and Grants

Scientific project and grants

2021-2023 *Multidimensional Persistence and Toric Topology* Bilateral project between Turkey and Serbia- **project leader**

2020-2022 *Discrete Morse theory and its applications* Bilateral project between Slovenia and Serbia- **project leader**

2019 *LabEx IRMIA Moyens de recherche grant 2019*, University of Strasbourg, France

2016-2017 *Applied Algebraic Topology* Bilateral project between Slovenia and Serbia

2015-present *Grant 19/6-020/961-120/14: Applications of dynamical software Cinderella in scientific and technological research, mathematics and educations*, Ministry for Science of the Republic of Srpska

2012-2019 Project 174020: Geometry and Topology of Manifolds, Classical Mechanics and Integrable Dynamical Systems, Ministry for Education and Science of the Republic of Serbia

2008-2011 Project 144014: *Geometry and Topology of Manifolds and Integrable Dynamical Systems*, Ministry for Education and Science of the Republic of Serbia

Horizon 2020 projects

2021-2025 *Leading Towards Sustainable Gender Equality Plans in research institutions* (LeTSGEPs)

2018-2020 *New Understanding of Communication, Learning and Engagement in Universities and Scientific Institutions* (NUCLEUS)

Science popularization projects

2011-2013 Project of math popularization *Math Alive*, Center for Promotion of Science of the Republic of Serbia

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Congresses, Conferences and Visits

Conference Talks

2021 *Topology of torus actions and related topics*, Sirius Mathematical Center, Sochi (online), Russia

2020 *International Conference Topology and Geometry of Group Actions*, Moscow (online), Russia

2020 *Thematic Program on Toric Topology and Polyhedral Products, Workshop on Polyhedral Products in Homotopy Theory*, The Fields Institute for Research in Mathematical Sciences, Toronto, Canada

2019 *Toric Topology in Okayama, Workshop for Young Researchers*, Okayama, Japan

2019 *Montenegrin Symposium on Geometry, Graphs, Informatics and Algebra*, Budva, Montenegro

2018 *International congress of mathematicians - ICM 2018*, Rio de Janeiro, Brazil - poster

2018 *International conference on occasion of Victor Buchstaber's 75th birthday: Algebraic topology, combinatorics and mathematical physics - International Seminar on Toric Topology and Homotopy Theory*, Steklov Institute of the Russian Academy of Sciences, Moscow, Russia

2018 *14th Serbian Mathematical Congress*, Kragujevac, Serbia

2017 *Summer Meeting*, Ho Chi Minh City, Vietnam - **invited speaker**

2016 *The 19th Geometric Seminar*, Zlatibor, Serbia

2015 *The 14th International Conference on Mathematics and its Applications (ICMA'15)*, Timisoara, Romania

2015 *Combinatorial and Toric Homotopy - Young Research Seminar*, IMS NUS, Singapore - **invited speaker**

2014 *5th Congress of Mathematicians of Macedonia*, Ohrid, Macedonia

2014 *The 4th Mathematical Conference of the Republic of Srpska*, Trebinje, Bosnia and Herzegovina

2013 *Young Topologist Meeting 2013*, EPFL, Laussane, Switzerland

2010 *Research program on 'Configuration Spaces: Geometry, Combinatorics and Topology', Young Researchers Seminar,* Centro di Ricerca Matematica Ennio di Giorgi, Pisa, Italy

Workshops and Summer Schools

2019 **7th Heidelberg Laureate Forum**, Heidelberg, Germany

2016 *5th GeToPhyMa Rational Homotopy Theory and its Interactions*, Rabat, Morocco

2016 *Graphs and Surfaces: Algorithms, Combinatorics and Topology*, Centre International de Rencontres Mathématiques, Luminy (Marseille), France

2015 *Convex geometry - discrete and computational*, BMS, Berlin, Germany

2015 *23rd GAeL, Géométrie Algébrique en Liberté*, Leuven, Belgium

2015 *Oberwolfach Seminar: Topological Combinatorics of Configuration Spaces*, MFO, Obervolfach, Germany

2014 *The 2nd European Summer School for Visual Arts and Education*, Belgrade, Serbia - invited speaker and organizer

2014 *Workshop: Curves and equations*, Levico Terme, Italy

2013 **1st Heidelberg Laureate Forum**, Heidelberg, Germany

2012 *Discrete Morse theory and commutative algebra*, Institute Mittag Leffler, Stockholm, Sweden

Visits and Invited Lectures

2022 University of Pennsylvania, Deformation Theory Seminar (online), United States of America

2021 American University of Sharjah, Sharjah, Mathematical Seminar, United Arab Emirates

2019 Institut de Recherche Mathématique Avancée, University of Strasbourg, Séminaire GT3, Strasbourg, France

2018 University of Buenos Aires, Faculty of Exact and Natural Sciences, Department of Mathematics, Topology Seminar, Buenos Aires, Argentina

2018 Faculty of Science, Department of Mathematics, Colloquium, Podgorica, Montenegro

2017 Vietnam Institute for Advanced Studies in Mathematics, Hanoi, Vietnam - **Junior Visiting Fellowship**

2016 Faculty of Mathematics, Natural Sciences and Information Technologies, Seminar, Koper, Slovenia

2016 Faculty of Mathematics and Physics, Geometric Topology Seminar, Ljubljana, Slovenia

2015 Mathematical Institute SANU, Colloquium, Belgrade, Serbia

2015 Faculty of Science, Department of Mathematics, Colloquium, Podgorica, Montenegro

2015 Faculty of Science, Department of Mathematics, Colloquium, Banja Luka, Bosnia and Herzegovina

2014 Faculty of Science, Department of Mathematics, Colloquium, Skopje, Macedonia

2014 Faculty of Science, Department of Mathematics, Colloquium, Zagreb, Croatia

2010 Faculty of Mathematics and Physics, Geometric Topology Seminar, Ljubljana, Slovenia

Organization of Scientific Events

2019 *1st Joint Mathematical Meeting of Serbia and Montenegro*, Budva, Montenegro

2018 *Mini-course 'Tensors in Applied Algebraic Geometry'* by Bernd Sturmpfels at MI SANU

2018 *Workshop 'Algebraic Topology - Methods, Applications and Computation'*, 14th Serbian Mathematical Congress, Kragujevac, Serbia

2017-2022 **Student Seminar of the Mathematical Institute SANU, founder and the first chairman**

2017-2018 *Workshop 'Annual Meeting of Seminar for Topology of Configuration Spaces'*, Belgrade, Serbia

2012-2015 *Mathematical Conference of the Republic of Srpska*, Trebinje, Bosnia & Herzegovina

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Editorial and Referee work

Editorial work

2015 - present **Associate Editor, Kragujevac Journal of Mathematics**

2014 - 2015 *member of the Editorial Board of PROCEEDINGS OF FOURTH MATHEMATICAL CONFERENCE OF THE REPUBLIC OF SRPSKA*

Reviewer work

European Journal of Mathematics, American Mathematical Monthly, Mathematical Intelligencer, Discrete and Applicable Analysis, Filomat, Kragujevac Journal

of Mathematics, Matematički vesnik, Bulletin Mathématique de la Société de la République Macédoine

Zentralblatt, AMS Mathematical Reviews

Science Promotion Activities

2017 Math Open Day, Hanoi, Vietnam

2017-present Bridge of Mathematics, Vrnjačka Banja, Serbia

2016 Math Festival, Skopje, Macedonia

2015 Days of Mathematics, Banja Luka, Bosnia and Herzegovina

2011-present **May Month of Mathematics M3** - Serbia

2008-present State Seminar for Mathematics and Computer Science teachers, Serbia

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Membership in Mathematical Associations

2018 Mathematical Forum of Montenegro, president of the committee for international collaboration

2018 Union of Mathematicians of Macedonia

2011 European Mathematical Society

2008 Mathematical Society of Serbia

Languages

Serbian, English, Spanish