

CURRICULUM VITAE

Marko Vojinović

Personal Data

Date of birth: 28. March 1978.
Place of birth: Pančevo, Republic of Serbia
Citizenship: Serbian
Marital status: Single
Contact: Group for Gravitation, Particles and Fields
Institute of Physics, University of Belgrade
Pregrevica 118, 11080 Belgrade, Serbia
[\[vmarko@ipb.ac.rs\]](mailto:vmarko@ipb.ac.rs)
[\[http://www.markovojinovic.com/\]](http://www.markovojinovic.com/)



Affiliations

03/2024 – present: Full Research Professor at Group for Gravitation, Particles and Fields
Institute of Physics, University of Belgrade
[\[http://www.gravity.ipb.ac.rs/\]](http://www.gravity.ipb.ac.rs/)

10/2016 – 03/2024: Associate Research Professor at Group for Gravitation, Particles and Fields
Institute of Physics, University of Belgrade
[\[http://www.gravity.ipb.ac.rs/\]](http://www.gravity.ipb.ac.rs/)

03/2016 – 10/2016: Assistant Research Professor at Group for Gravitation, Particles and Fields
Institute of Physics, University of Belgrade
[\[http://www.gravity.ipb.ac.rs/\]](http://www.gravity.ipb.ac.rs/)

03/2013 – 03/2016: Post-doc researcher at Group of Mathematical Physics
Institute for Interdisciplinary Research, University of Lisbon
[\[http://gfm.cii.fc.ul.pt/\]](http://gfm.cii.fc.ul.pt/)

03/2012 – 03/2013: Assistant Research Professor at Group for Gravitation, Particles and Fields
Institute of Physics, University of Belgrade
[\[http://www.gravity.ipb.ac.rs/\]](http://www.gravity.ipb.ac.rs/)

03/2009 – 03/2012: Post-doc researcher at Group of Mathematical Physics
Institute for Interdisciplinary Research, University of Lisbon
[\[http://gfm.cii.fc.ul.pt/\]](http://gfm.cii.fc.ul.pt/)

10/2006 – 03/2009: Research Assistant at Group for Gravitation, Particles and Fields
Institute of Physics, University of Belgrade
[\[http://www.gravity.ipb.ac.rs/\]](http://www.gravity.ipb.ac.rs/)

10/1997 – 07/2008: Major/Master/PhD student at Theoretical Physics department
Faculty of Physics, University of Belgrade
[\[http://www.ff.bg.ac.rs/\]](http://www.ff.bg.ac.rs/)

Research Interests

- quantum gravity and general relativity
- foundations of quantum mechanics
- category theory
- field theory, unification of interactions
- quantum information theory
- algebraic topology

Publications — books

- [1] *State-Sum Models of Piecewise Linear Quantum Gravity*
A. Miković and M. Vojinović, *World Scientific*, Singapore (2023)
[ISBN: 978-981-126-931-8, DOI: 10.1142/13233]

Publications — papers

- [29] *Henneaux–Teitelboim gauge symmetry and its applications to higher gauge theories*
M. Đorđević, T. Radenković, P. Stipsić and M. Vojinović, *Universe* **9**, 281 (2023) [[arXiv:2305.00117](#)]
- [28] *Operational interpretation of the vacuum and process matrices for identical particles*
R. Faleiro, N. Paunković and M. Vojinović, *Quantum* **7**, 986 (2023) [[arXiv:2010.16042](#)]
- [27] *Hamiltonian analysis of the BFCG theory for a strict Lie 2-group*
A. Miković, M. A. Oliveira and M. Vojinović, *Adv. Theor. Math. Phys.* **26**, 3783 (2022)
[[arXiv:1610.09621](#)]
- [26] *Equivalence principle in classical and quantum gravity*
N. Paunković and M. Vojinović, *Universe* **8**, 598 (2022) [[arXiv:2210.00133](#)]
- [25] *Topological invariant of 4-manifolds based on a 3-group*
T. Radenković and M. Vojinović, *JHEP* **07**, 105 (2022) [[arXiv:2201.02572](#)]
- [24] *Gauge symmetry of the 3BF theory for a generic semistrict Lie three-group*
T. Radenković and M. Vojinović, *Class. Quant. Grav.* **39**, 135009 (2022) [[arXiv:2101.04049](#)]
- [23] *Standard Model and 4-groups*
A. Miković and M. Vojinović, *Europhys. Lett.* **133**, 61001 (2021) [[arXiv:2008.06354](#)]
- [22] *Causal orders, quantum circuits and spacetime: distinguishing between definite and superposed causal orders*
N. Paunković and M. Vojinović, *Quantum* **4**, 275 (2020) [[arXiv:1905.09682](#)]
- [21] *Hamiltonian Analysis for the Scalar Electrodynamics as 3BF Theory*
T. Radenković and M. Vojinović, *Symmetry* **12**, 620 (2020) [[arXiv:2004.06901](#)]
- [20] *Higher gauge theories based on 3-groups*
T. Radenković and M. Vojinović, *JHEP* **10**, 222 (2019) [[arXiv:1904.07566](#)]
- [19] *Entanglement-induced deviation from the geodesic motion in quantum gravity*
F. Pipa, N. Paunković and M. Vojinović, *Jour. Cosmol. Astropart. Phys.* **09**, 057 (2019)
[[arXiv:1801.03207](#)]
- [18] *Hamiltonian analysis of the BFCG formulation of general relativity*
A. Miković, M. A. Oliveira and M. Vojinović, *Class. Quant. Grav.* **36**, 015005 (2019) [[arXiv:1807.06354](#)]
- [17] *Gauge protected entanglement between gravity and matter*
N. Paunković and M. Vojinović, *Class. Quant. Grav.* **35**, 185015 (2018) [[arXiv:1702.07744](#)]
- [16] *Causal dynamical triangulations in the spincube model of quantum gravity*
M. Vojinović, *Phys. Rev. D* **94**, 024058 (2016) [[arXiv:1506.06839](#)]
- [15] *Hamiltonian analysis of the BFCG theory for the Poincaré 2-group*
A. Miković, M. A. Oliveira and M. Vojinović, *Class. Quant. Grav.* **33**, 065007 (2016) [[arXiv:1508.05635](#)]
- [14] *Solution to the Cosmological Constant Problem in a Regge Quantum Gravity Model*
A. Miković and M. Vojinović, *Europhys. Lett.* **110**, 40008 (2015) [[arXiv:1407.1394](#)]

- [13] *Cosine problem in EPRL/FK spin foam model*
M. Vojinović, *Gen. Relativ. Gravit.* **46**, 1616 (2014) [[arXiv:1307.5352](#)]
- [12] *A finiteness bound for the EPRL/FK spin foam model*
A. Miković and M. Vojinović, *Class. Quant. Grav.* **30**, 035001 (2013) [[arXiv:1101.3294](#)]
- [11] *Poincaré 2-group and quantum gravity*
A. Miković and M. Vojinović, *Class. Quant. Grav.* **29**, 165003 (2012) [[arXiv:1110.4694](#)]
- [10] *Effective action for EPRL/FK spin foam models*
A. Miković and M. Vojinović, *Jour. Phys. Conf. Ser.* **360**, 012049 (2012) [[arXiv:1110.6114](#)]
- [9] *Effective action and semiclassical limit of spin foam models*
A. Miković and M. Vojinović, *Class. Quant. Grav.* **28**, 225004 (2011) [[arXiv:1104.1384](#)]
- [8] *Large-spin asymptotics of Euclidean LQG flat-space wavefunctions*
A. Miković and M. Vojinović, *Adv. Theor. Math. Phys.* **15**, 801 (2011) [[arXiv:1005.1866](#)]
- [7] *Test membranes in Riemann-Cartan spacetimes*
M. Vasilčić and M. Vojinović, *Phys. Rev. D* **81**, 024025 (2010) [[arXiv:0812.4694](#)]
- [6] *Spinning branes in Riemann-Cartan spacetime*
M. Vasilčić and M. Vojinović, *Phys. Rev. D* **78**, 104002 (2008) [[arXiv:1010.1861](#)]
- [5] *Zero-size objects in Riemann-Cartan spacetime*
M. Vasilčić and M. Vojinović, *JHEP* **08** 104 (2008) [[arXiv:0807.0596](#)]
- [4] *Interaction of particle with the string in pole-dipole approximation*
M. Vasilčić and M. Vojinović, *Fortschr. Phys.* **56**, 542 (2008) [[arXiv:1010.1852](#)]
- [3] *Single-Pole Interaction of the Particle with the String*
M. Vasilčić and M. Vojinović, *SIGMA* **4**, 019 (2008) [[arXiv:0802.1655](#)]
- [2] *Classical spinning branes in curved backgrounds*
M. Vasilčić and M. Vojinović, *JHEP* **07** 028 (2007) [[arXiv:0707.3395](#)]
- [1] *Classical string in curved backgrounds*
M. Vasilčić and M. Vojinović, *Phys. Rev. D* **73**, 124013 (2006) [[arXiv:gr-qc/0610014](#)]

Publications — editorials

- [2] *Proceedings of the 10th Mathematical Physics Meeting: School and Conference on Modern Mathematical Physics*
Ed. B. Dragovich, I. Salom and M. Vojinović, *SFIN XXXIII*, 1–384 (2020)
Published by Institute of Physics, Belgrade, Serbia, ISBN 978-86-82441-51-9 [[electronic version](#)]
- [1] *Proceedings of the 9th Mathematical Physics Meeting: School and Conference on Modern Mathematical Physics*
Ed. B. Dragovich, I. Salom and M. Vojinović, *SFIN XXXI*, 1–324 (2018)
Published by Institute of Physics, Belgrade, Serbia, ISBN 978-86-82441-48-9 [[electronic version](#)]

Publications — conference proceedings

- [12] *Higher category theory and n-groups as gauge symmetries for quantum gravity*
B. Nikolić, D. Obrić, T. Radenković, I. Salom and M. Vojinović, *Jour. Phys. Conf. Ser.* **2667**, 012019 (2023) [[electronic version](#)]
- [11] *Possibilities for Parallelizing Simplicial Complexes Simulation*
D. Cvijetić, N. Korolija and M. Vojinović, *IcEtran proceedings*, 595 (2022)
Proceedings of the IX International Conference IcETRAN, Novi Pazar, Serbia, June 6-9 2022, Ed. V. Katić, ISBN 978-86-7466-930-3. [[electronic version](#)]
- [10] *Infrastructure for Simulating n-Dimensional Simplicial Complexes*
D. Cvijetić, N. Korolija and M. Vojinović, *IcEtran proceedings*, 590 (2022)
Proceedings of the IX International Conference IcETRAN, Novi Pazar, Serbia, June 6-9 2022, Ed. V. Katić, ISBN 978-86-7466-930-3. [[electronic version](#)]
- [9] *Quantum gravity and elementary particles from higher gauge theory*
T. Radenković and M. Vojinović, *Ann. Univ. Craiova Phys.* **30**, 74 (2020)
Proceedings of the Workshop on Quantum Fields and Nonlinear Phenomena, 24-29 September 2020, Craiova, Romania. [[arXiv:2103.08037](#)]
- [8] *Construction and examples of higher gauge theories*
T. Radenković and M. Vojinović, *SFIN XXXIII*, 251 (2020)
Proceedings of the 10th Mathematical Physics Meeting: School and Conference on Modern Mathematical Physics, September 9-14 2019, Ed. B. Dragovich, I. Salom and M. Vojinović, Institute of Physics, Belgrade, Serbia. [[arXiv:2005.09404](#)]
- [7] *Quantum gravity for piecewise flat spacetimes*
A. Miković and M. Vojinović, *SFIN XXXI*, 267 (2018)
Proceedings of the 9th Mathematical Physics Meeting: School and Conference on Modern Mathematical Physics, September 18-23 2017, Ed. B. Dragovich, I. Salom and M. Vojinović, Institute of Physics, Belgrade, Serbia. [[arXiv:1804.02560](#)]
- [6] *Gravity-Matter entanglement in Regge quantum gravity*
N. Paunković and M. Vojinović, *Jour. Phys. Conf. Ser.* **701**, 012035 (2016) [[arXiv:1601.06831](#)]
- [5] *Categorical generalization of spinfoam models*
A. Miković and M. Vojinović, *Jour. Phys. Conf. Ser.* **532**, 012020 (2014) [[arXiv:1512.06252](#)]
- [4] *Spincube model of quantum gravity*
M. Vojinović, *SFIN XXVI*, 361 (2013)
Proceedings of the 7th Mathematical Physics Meeting: Summer School and Conference on Modern Mathematical Physics, September 9-19 2012, Ed. B. Dragovich and Z. Rakić, Institute of Physics, Belgrade, Serbia. [[electronic version](#)]
- [3] *Category theory in spincube model of quantum gravity*
M. Vojinović, *Proceedings of the Vth Petrov International Symposium “High Energy Physics, Cosmology and Gravity”*, April 29 - May 5 2012, Ed. S. S. Moskaliuk, TIMPANI, Kyiv, Ukraine, p. 287 (2012) [[electronic version](#)]
- [2] *Effective action for EPRL/FK spin foam models*
A. Miković and M. Vojinović, *Jour. Phys. Conf. Ser.* **360**, 012049 (2012) [[arXiv:1110.6114](#)]
- [1] *Classical string in curved backgrounds*
M. Vasilic and M. Vojinović, *SFIN XX*, 403 (2007)
Proceedings of the 4th Summer School in Modern Mathematical Physics, September 3-14 2006, Ed. B. Dragovich and Z. Rakić, Institute of Physics, Belgrade, Serbia [[electronic version](#)]

Research Projects

- Project name: “Quantum Gravity from Higher Gauge Theory — QGHG-2021”
Institution: Institute of Physics, University of Belgrade (program IDEAS of the Science Fund of the Republic of Serbia)
Status: In progress
Leadership: Marko Vojinović
- Project name: “Causality in Quantum Mechanics and Quantum Gravity - 2018-2019”
Institution: Institute of Physics, University of Belgrade (bilateral project between Austria and Serbia)
Status: Completed successfully
Leadership: Marko Vojinović (Serbia), Časlav Brukner (Austria)
- Project name: “Quantum Gravity and Quantum Integrable Models - 2015-2016”
Institution: Group of Mathematical Physics, University of Lisbon (bilateral project between Portugal and Serbia)
Status: Completed successfully
Leadership: Djordje Šijački (Serbia), Aleksandar Miković (Portugal)
- Project name: “Strategic Project - UI 208 - 2013-2014”
Institution: Group of Mathematical Physics, University of Lisbon
Status: Completed successfully
Leadership: Jean-Claude Zambrini
- Project name: “Physical implications of modified spacetime”
Institution: Institute of Physics, University of Belgrade
Status: In progress
Leadership: Maja Burić
- Project name: “Strategic Project - UI 208 - 2011-2012”
Institution: Group of Mathematical Physics, University of Lisbon
Status: Completed successfully
Leadership: Jean-Claude Zambrini
- Project name: “Algebroids, Geometry, Quantum Groups and Applications”
Institution: Faculty of Sciences and Technology, University of Coimbra
Status: Completed successfully
Leadership: Joana Margarida Mavigne Andrade A. S. Nunes da Costa
- Project name: “Constituents, Fundamental Forces and Symmetries of the Universe”
Institution: Marie Curie Research Training Network (European Community FP6),
Institute for Nuclear Research and Nuclear Energy, Sofia, Bulgaria
Status: Completed successfully
Leadership: Dieter Lüst

- Project name: “Alternative theories of gravity”
Institution: Institute of Physics, University of Belgrade
Status: Completed successfully
Leadership: Milutin Blagojević
- Project name: “Gradient theories of gravity: symmetry and dynamics”
Institution: Institute of Physics, University of Belgrade
Status: Completed successfully
Leadership: Branislav Sazdović

Education

10/2006 – 07/2008:	Faculty of Physics, University of Belgrade Theoretical Physics PhD
11/2003 – 10/2006:	Faculty of Physics, University of Belgrade Theoretical Physics Master
10/1997 – 09/2002:	Faculty of Physics, University of Belgrade GPA: 9.68 out of 10.00; Theoretical Physics Major
09/1993 – 06/1997:	High School of Mathematics in Belgrade specialized in mathematics, physics and computer science

Theses

07/2008	PhD thesis: " Motion of extended objects in gravitational field with torsion " Group for Gravitation, Particles and Fields, University of Belgrade Thesis supervisor: prof. dr Milovan Vasilic
10/2006	Master thesis: " Classical string motion in curved spacetimes " Group for Gravitation, Particles and Fields, University of Belgrade Thesis supervisor: prof. dr Milovan Vasilic
09/2002	Diploma thesis: " Duality Symmetry in Born-Infeld Electrodynamics " Group for Gravitation, Particles and Fields, University of Belgrade Thesis supervisor: prof. dr Maja Burić

Invited talks and visits

- 10 - 15 October 2022, Vienna, Austria
[Visit to the group for Quantum Foundations and Quantum Information Theory, University of Vienna](#)
- 13 - 17 October 2020, Belgrade, Serbia
[XIX Serbian Astronomical Conference \(SAC19\), Department of Astronomy, Faculty of Mathematics, University of Belgrade](#)
- 27 - 29 September 2020, Craiova, Romania
[Workshop on Quantum Fields and Nonlinear Phenomena, University of Craiova](#)
- 13 - 17 January 2020, Hong Kong, China
[QISS HKU 2020 Workshop, Department of computer science, University of Hong Kong](#)

- 2 April 2019, Valjevo, Serbia
[Visit to the Petnica Science Center, Valjevo, Serbia](#)
- 15 March 2019, Novi Sad, Serbia
[Visit to the Department for Physics, University of Novi Sad](#)
- 16 October - 15 December 2017, Vienna, Austria
[Visit to the group for Quantum Foundations and Quantum Information Theory, University of Vienna](#)
- 18 - 20 October 2016, Geneva, Switzerland
[Visit to the group for Philosophy of Quantum Gravity, University of Geneva](#)
- 8 - 15 November 2015, Nijmegen, Netherlands
[Visit to the Quantum Gravity group, Radboud University, Nijmegen](#)
- 29 April - 5 May 2012, Kyiv, Ukraine
[The Fifth Petrov International Symposium on High Energy Physics, Cosmology and Gravity](#)
- 9 - 10 May 2011, Marseille, France
[Visit to the Quantum Gravity group, Centre de Physique Théorique de Luminy, Marseille](#)

References

Dr. Jean Claude Zambrini
Group of Mathematical Physics
University of Lisbon
jczambrini@gmail.com

Dr. Maja Burić
Faculty of Physics
University of Belgrade
majab@ipb.ac.rs

Dr. Aleksandar Miković
Department of Mathematics
Lusofona University
amikovic@ulusofona.pt

PhD and MSc students

04.07.2023. successful PhD defense, *Tijana Radenković* (University of Belgrade)
2023-danas started work on MSc thesis, *Petar Petrašinović* (University of Belgrade)
2022-danas started work on PhD thesis, *Mihailo Đorđević* (University of Belgrade)
2020-danas started work on PhD thesis, *Pavle Stipsić* (University of Belgrade)
28.09.2021. successful MSc defense, *Mihailo Đorđević* (University of Belgrade)
27.09.2017. successful MSc defense, *Tijana Radenković* (University of Belgrade)
2013-2015. co-mentorship of the PhD thesis, *Miguel Ângelo Oliveira* (University of Lisbon)

Awards

05/2024 “IPB Annual Award for 2023”, Award for best research, Institute of Physics Belgrade
02/2003 “Best Student of the Generation” Belgrade University Award
12/2002 “Prof. dr Lj. Čirković” Award for the best diploma thesis in physics
10/2001 “To a Promising Generation” Award of Norwegian Government

Grants and scholarships

2017 Joint Excellence in Science and Humanities (JESH) grant of the Austrian Academy of Sciences (ÖAW), Austria
2015 Short Term Scientific Mission (STSM) grant of the COST Action MP1405 “Quantum Structure of Spacetime”
2013 – 2016 Post-doctoral scholarship of the Foundation for Science and Technology, Portugal
2009 – 2012 Post-doctoral scholarship of the Foundation for Science and Technology, Portugal
2002 – 2003 Scholarship of the Serbian Ministry of Science and Environmental Protection

Computer and IT Skills

- Advanced knowledge of T_EX, Mathematica, Prolog, C, bash scripting, assembly language
- Administrative knowledge of Linux operating systems
- Administrative knowledge of network and TCP/IP services
- Experience with HPC cluster building and deployment, videoconferencing, digital video editing
- Experience with massive parallelization and GRID infrastructure

Language Skills

English (fluent), **Serbian** (native)