

Curriculum Vitae

First name | Surname : Tajron Jurić

Address

Theoretical Physics Division

Ruder Bošković Institute

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Born 28 December 1987, Zagreb (Croatia)

Education

1994-1996

Elementary school (*Susedgrad, Zagreb*)

1996-2002

Elementary school (*Ksaver Šandor Đalski, Donja Zelina*)

2002-2006

High school (*Srednja škola Sesvete, opća gimnazija, Zagreb*)

2006-2011

Faculty of Science, University of Zagreb

5 May 2011

Mag. Phys.

Master thesis:

Feynman approach to electrodynamics and gravity

advisor: dr. sc. Stjepan Meljanac

October 2011- November 2014

PhD student, University of Zagreb

26 November 2014

Dr. Sc.

PhD thesis:

κ -Minkowski-space and Planck scale physics

advisor: dr. sc. Stjepan Meljanac

Research interests

- Theoretical and Mathematical Physics
- commutative and noncommutative Quantum Field Theory
- noncommutative spaces, generalized symmetries (Hopf algebra and Hopf algebroid), differential geometry and gauge theory
- noncommutative geometry, spectral triples, spectral action and application to particle physics
- quantum-mechanical completeness, symmetry inheritance and nonlinear fields
- mathematical structures behind Feynman integrals (period, motives) and Algebraic renormalization
- Planck scale physics, black holes and entanglement entropy
- quantum physics, Loschmidt echo, quantum thermalization and integrable systems

Positions

- July 2011 - December 2014: research assistant at Theoretical Physics Division, Ruđer Bošković Institute, Zagreb, Croatia.
- January 2015 - September 2016: postdoc at Theoretical Physics Division, Ruđer Bošković Institute, Zagreb, Croatia.
- September 2016 - September 2017: postdoc at Instituto de Física, Universidade de Brasília, Brasília, DF, Brazil
- September 2017 - January 2019 : postdoc at Theoretical Physics Division, Ruđer Bošković Institute, Zagreb, Croatia.
- January 2019 - today : research associate at Theoretical Physics Division, Ruđer Bošković Institute, Zagreb, Croatia.

Teaching experience

Teaching assistant at the University of Zagreb, Department of Physics:

- Physics 1&2 (first year courses for Chemists 2011/12)
- General Physics 1&2 (first year courses for Physicists 2012/13)
- General Physics 3&4 (second year courses for Physicists 2013/14)
- Mathematical methods for physics 1&2 (second year courses for Physicists 2014/15, 2015/16 and 2018/19)

Scientific titles

- July 2011: Research Assistant at RBI
- December 2014: Senior Assistant/Postdoc at RBI
- April 2014: Postdoc, elected by PMF, University of Zagreb
- July 2016: Research Associate, elected by RBI

Schools, workshops and conferences

- „Sarajevo School of High Energy Physics“, May 2011, Sarajevo, BiH
- „The BS2011 School – Cosmology and Particle Physics Beyond the Standard Models“, Donji Milanovac, Srbija, August 2011
- „Supersymmetry for toddlers ... and experimentalists“, IRB, Zagreb, December 2011
- „2nd Mediterranean Conference on Classical and Quantum Gravity“, Veli Lošinj, June 2013
- Clay Mathematics Institute Summer School 2014; “Periods and Motives: Feynman amplitudes in the 21st century”, ICMAT, Madrid (Spain) June 30 - July 25, 2014
- Summer School: “Topics in Non-commutative Geometry”, HIM, Bonn, Germany, September 8-12, 2014
- ESI Program – “The interrelation between mathematical physics, number theory and non-commutative geometry”, Erwin Schrödinger International Institute for Mathematical Physics, Vienna, March 2 - March 13, 2015
- Bayrischzell Workshop 2015 “Quantization, geometry and mathematical physics” Bayrischzell, May 29- June 1, 2015
presented a talk entitled “Towards the classification of differential calculi on kappa-Minkowski space and related field theories”
- Corfu Summer Institute: “Humboldt Kolleg Open Problems in Theoretical Physics: the Issue of Quantum Space-Time” September 18 - 22, 2015
- Corfu Summer Institute “Workshop on Noncommutative Field Theory and Gravity” September 21 - 27, 2015
- Bayrischzell Workshop 2016 “Quantum spacetime structures: Dualities and new geometries” Bayrischzell, April 29- May 3, 2016
- XXXVII Max Born Symposium “Noncommutative geometry, quantum symmetries and quantum gravity II”, 4 - 7 July 2016, Wroclaw, Poland.
presented a talk “Noncommutative field theories on \mathbb{R}^3 ”

- “*Quantum Structure of Spacetime and Gravity*”, August 21-28, Belgrade, Serbia.
presented a talk “*Closed star product on noncommutative \mathbb{R}^3 and scalar field dynamics*”
- “*Topological and geometrical aspects of quantum spaces field theory and causal structure*”, 13 March 2017 - 17 March 2017, SISSA, Trieste, Italy
presented a talk “*Effects of Noncommutativity on the Black Hole Entropy and QNM*”
- Bayrischzell Workshop 2018 “*On Noncommutativity and Physics: Hopf algebras in Noncommutative Geometry*” Bayrischzell, April 20 - 23, 2018
- “*Conference on Symmetries, Geometry and Quantum Gravity*” 18-22 June 2018, Primošten, Croatia
preseted a talk “*Quantum space and quantum completeness*”

Research visits

- French Government Grant for visiting scientific institutions in France for young researchers, December 1 - December 29, 2014,
Laboratoire de Physique Theorique d’Orsay, Host: Prof. J.C. Wallet.
Invited seminar: “ κ -Minkowski space and Planck scale physics”
- French Government and Ruder Bošković Institute Grant for visiting scientific institutions in France for young researchers, October 26 - November 25, 2015,
Laboratoire de Physique Theorique d’Orsay, Host: Prof. J.C. Wallet
- February 14 - February 20, 2016: Departamento de Física Teórica, University of Zaragoza, Host: Prof. Amilcar Quiroz and Filiberto Ares. Topics: quantum field theory, noncommutative geometry and entanglement entropy
- March 1 - March 30, 2016: LPT, Orsay, Paris, France, Host: Prof. J.C. Wallet, funded by RBI-T-Winning. Topics: quantum field theory, noncommutative geometry and spectral triples
- April 17-24, 2016: SISSA, Trieste, Italy. Host: Prof. L. Dabrowski. Topics: quantum field theory, noncommutative geometry and spectral triples. Funded by RBI-T-Winning
Invited seminar “Some examples of NCQFT and NC metric”
- May 20 - June 19, 2016: LPT, Orsay, Paris, France, Host: Prof. J.C. Wallet, funded by Universite Paris-Sud and RBI-T-Winning. Topics: quantum field theory, noncommutative geometry and spectral triples
Invited seminar “Noncommutative geometry and physics”
- March 3-26, 2017: SISSA, Trieste, Italy. Host: Prof. L. Dabrowski. Topics: quantum field theory, BTZ and spinors in spectral triple approach. Funded by RBI-T-Winning
Invited seminar “BTZ black hole and NC contributions to entropy”

- September 9, 2016 - September 12, 2017: postdoc scholarship within Programa de Pos Doutorado funded by CAPES at IF, UnB, Brasilia, Host: Prof. A. Queiroz and Prof. A. Pinzul
- September 12 - September 26, 2017: LPT, Orsay, Paris, France, Host: Prof. J.C. Wallet, funded by RBI-T-Winning. Topics: NC quantum field theory, twisted trace and KMS condition
- March 16 - April 9, 2018: LPT, Orsay, Paris, France, Host: Prof. J.C. Wallet, funded by RBI-T-Winning. Topics: NC quantum field theory, vacuum energy and the cosmological constant problem
- November 22 - November 29, 2018: LPT, Orsay, Paris, France, Host: Prof. J.C. Wallet, funded by RBI-T-Winning. Topics: NC quantum field theory, vacuum energy and the cosmological constant problem
- December 12 - December 17, 2018: Fizički fakultet, Beograd, Srbija, Host: Prof. M.D.Čirić, funded by RBI-T-Winning. Topics: NC scalar field on RN background

Research project and organization of workshops

- 098-0000000-2865 “Quantum field theory, noncommutative spaces and symmetries”, funded by the Croatian Ministry of Science, Education and Sport, 2011-2014. Function: team member
- IP-2014-09-9582 “Toward quantum gravity: noncommutative geometry, field theory and cosmology”, funded by Croatian Science Foundation, 2015-2017. Function: team member and actively participated in the preparation of the project proposal <http://thphys.irb.hr/TQG.htm>
- RBI-T-WINNING, funded by the European Commission under H2020, 2016-2018. Function: team member and actively participated in the preparation of the project proposal regarding math-phys <http://rbi-t-winning.irb.hr/index.php?title=RBI-T-WINNING>
- COST-Quantum structure of spacetime, MC-substitute
- Member of the organizing committee for the workshop “Topological and geometric aspects of quantum spaces”, March 13-March 17, 2017, Trieste, Italy
- Member of the organizing committee for the conference “Conference on Symmetries, Geometry and Quantum Gravity” 18-22 June 2018, Primošten, Croatia

Invited talks, seminars and lectures

- “Quantum space and quantum completeness”, talk at “Conference on Symmetries, Geometry and Quantum Gravity” 18-22 June 2018, Primošten, Croatia

- “Noncommutative Geometry and Physics”, Colóquio do IF, Universidade de Brasilia, Brazil, May 11, 2017.
- “BTZ black hole and NC contributions to entropy”, invited seminar at SISSA, Trieste, March 23, 2017.
- “Effects of Noncommutativity on the Black Hole Entropy and QNM”, talk at workshop “Topological and geometrical aspects of quantum spaces field theory and causal structure”, 13 March 2017 - 17 March 2017, SISSA, Trieste, Italy
- “Closed star product on noncommutative \mathbb{R}^3 and scalar field dynamics”, talk at school “Quantum Structure of Spacetime and Gravity”, August 21-28, 2016, Belgrade, Serbia.
- “Noncommutative field theories on \mathbb{R}^3 ”, talk at the XXXVII Max Born Symposium “Noncommutative geometry, quantum symmetries and quantum gravity II”, 4 - 7 July 2016, Wroclaw, Poland.
- “Noncommutative geometry and physics”, invited lecture by SInJe, LPT-Orsay, France, June 14, 2016.
- “Some examples of NCQFT and NC metric”, invited seminar at SISSA, Trieste, April 19, 2016.
- “Towards the classification of differential calculi on kappa-Minkowski space and related field theories”, talk at workshop “Quantization, geometry and mathematical physics” Bayrischzell, May 29- June 1, 2015
- “ κ -Minkowski space and Planck scale physics”, invited seminar at LPT-Orsay, France, December 17, 2014.
- “ κ -Poincare algebra and Hopf algebroid structure of phase space”, Theoretical Physics Seminar at RBI, Zagreb, Croatia, September 9, 2014.

List of publications

1. E. Harikumar, **T. Jurić** and S. Meljanac, “Electrodynamics on κ -Minkowski space-time,” **Phys. Rev. D** **84**, 085020 (2011) [arXiv:1107.3936 [hep-th]].
2. E. Harikumar, **T. Jurić** and S. Meljanac, “Geodesic equation in κ -Minkowski spacetime,” **Phys. Rev. D** **86** (2012) 045002 [arXiv:1203.1564 [hep-th]].
3. **T. Jurić**, S. Meljanac and R. Štrajn, “Differential forms and κ -Minkowski spacetime from extended twist,” **Eur. Phys. J. C** **73** (2013) 2472 [arXiv:1211.6612 [hep-th]].
4. **T. Jurić**, S. Meljanac and R. Strajn, “ κ -Poincaré-Hopf algebra and Hopf algebroid structure of phase space from twist,” **Phys. Lett. A** **377** (2013) 2472 [arXiv:1303.0994 [hep-th]].
5. **T. Jurić**, S. Meljanac and R. Strajn, “Twists, realizations and Hopf algebroid structure of kappa-deformed phase space,” **Int. J. Mod. Phys. A** **29** (2014) 5, 1450022 [arXiv:1305.3088 [hep-th]].

6. **T. Jurić**, S. Meljanac and R. Strajn, “*Universal κ -Poincaré covariant differential calculus over κ -Minkowski space*,” **Int. J. Mod. Phys. A** **29** (2014) 1450121 [arXiv:1312.2751 [hep-th]].
7. K. S. Gupta, E. Harikumar, **T. Juric**, S. Meljanac and A. Samsarov, “*Effects of Noncommutativity on the Black Hole Entropy*,” **Adv. High Energy Phys.** Vol. 2014 (2014), Article ID 139172, arXiv:1312.5100 [hep-th]
8. **T. Juric**, D. Kovacevic and S. Meljanac, “ *κ -Deformed Phase Space, Hopf Algebroid and Twisting*,” **SIGMA** **10**, 106 (2014), [arXiv:1402.0397 [math-ph]].
9. **T. Jurić**, S. Meljanac, D. Pikutić and R. Štrajn, “*Toward the classification of differential calculi on κ -Minkowski space and related field theories*,” **JHEP** **1507**, 055 (2015), [arXiv:1502.02972 [hep-th]].
10. K. S. Gupta, E. Harikumar, **T. Jurić**, S. Meljanac and A. Samsarov, “*Noncommutative scalar quasinormal modes and quantization of entropy of a BTZ black hole*,” **JHEP** **1509**, 025 (2015), [arXiv:1505.04068 [hep-th]].
11. **T. Jurić**, S. Meljanac and A. Samsarov, “*Light-like κ -deformations and scalar field theory via Drinfeld twist*,” **J. Phys. Conf. Ser.** **634**, no. 1, 012005 (2015), [arXiv:1506.02475 [hep-th]].
12. **T. Juric**, S. Meljanac and D. Pikutić, “*Realizations of κ -Minkowski space, Drinfeld twists and related symmetry algebras*,” **Eur. Phys. J. C** **75**, no. 11, 528 (2015), [arXiv:1506.04955 [hep-th]].
13. A. Géré, **T. Jurić** and J. C. Wallet, “*Noncommutative gauge theories on \mathbb{R}_λ^3 : Perturbatively finite models*,” **JHEP** **12** (2015) 045, arXiv:1507.08086 [hep-th].
14. **T. Jurić**, S. Meljanac and A. Samsarov, “*Twist deformations leading to κ -Poincaré Hopf algebra and their application to physics*,” **J. Phys. Conf. Ser.** **670** (2016) 1, 012027 [arXiv:1511.05592 [hep-th]].
15. **T. Jurić** and A. Samsarov, “*Entanglement Entropy Renormalization for the NC scalar field coupled to classical BTZ geometry*,” **Phys. Rev. D** **93**, no. 10, 104033 (2016), arXiv:1602.01488 [hep-th].
16. A. Borowiec, **T. Juric**, S. Meljanac and A. Pachol, “*Noncommutative tetrads and quantum spacetimes*,” **Int. J. Geom. Meth. Mod. Phys.** **13** (2016) no.08, 1640005 arXiv:1602.01292 [hep-th].
17. **T. Jurić**, T. Poulain and J. C. Wallet, “*Closed star product on non-commutative \mathbb{R}^3 and scalar field dynamics*,” **JHEP** **1605**, 146 (2016) arXiv:1603.09122 [hep-th].
18. **T. Jurić**, T. Poulain and J. C. Wallet, “*Involutive representations of coordinate algebras and quantum spaces*,” **JHEP** **1707** (2017) 116, arXiv:1702.06348 [hep-th].

19. K. S. Gupta, **T. Jurić** and A. Samsarov, “*Noncommutative duality and fermionic quasinormal modes of the BTZ black hole,*” **JHEP** **1706** (2017) 107, arXiv:1703.00514 [hep-th].
20. **T. Jurić**, “Quantum space and quantum completeness,” **JHEP** **1805** (2018) 007, arXiv:1802.09873 [hep-th].
21. **T. Jurić**, T. Poulain and J. C. Wallet, “Vacuum energy and the cosmological constant problem in κ -Poincaré invariant field theories,” *Phys. Rev. D* **99** (2019) no.4, 045004, arXiv:1805.09027 [hep-th].

Track record (according to INSPIRE, January 2019)

21 scientific papers with total 280 citations and h-index 11.

Languages

Croatian (native speaker), English (very good command), Portuguese (good command), German (basic communication skills)

Awards and scholarships

- Stipendija Grada Zagreba za školsku godinu 2004/05 i 2005/06
- Stipendija Hrvatskog Olimpijskog odbora za vrhunske sportaše (III. kategorija) 2008. i 2009.
- Stipendija Nacionalne zaklade za potporu učeničkom i studentskom standardu 2010/11.
- Stipendija Veleposlanstva Republike Francuske za sufinanciranje kratkoročnog posjeta znanstvenim institucijama Republike Francuske 2014.
- Stipendija Veleposlanstva Republike Francuske i IRB-a za sufinanciranje kratkoročnog posjeta znanstvenim institucijama Republike Francuske 2015.
- Godišnja nagrada IRB-a za izvrstan znanstveni rad u 2013.
- Poslijedoktorska stipendija “Programa de Pos Doutorados”, CAPES, IF, UnB, Brasilia, 2016