

Ivica Smolić

University of Zagreb
Faculty of Science
Department of Physics

Curriculum Vitae

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Born 18 July 1980, Šibenik (Croatia)

Education

1986 – 1994 Elementary school (“Lepa Šarić” \simeq “Tin Ujević”, Šibenik)

1994 – 1998 High school (Gimnazija Antuna Vrančića, Šibenik)

1998 – 2004 Faculty of Science, Zagreb

21 Sep 2004 **BSc**, University of Zagreb
Diploma thesis: *Lovelock gravitation*
advisor: Prof. Silvio Pallua

2005 – 2010 PhD student, University of Zagreb

9 Jul 2010 **PhD**, University of Zagreb
PhD Thesis: *Hawking radiation, W algebras and anomalies*
advisors: Prof. Silvio Pallua and Prof. Lorianò Bonora

Working Experience

2004₁₂ – 2013₆ **Research/Teaching assistant**
(Department of Physics, Faculty of Science, University of Zagreb)

- ★ Mathematical methods in physics (2nd year), 2005/06–2009/10
- ★ Classical electrodynamics (3rd year) 2011/12–2013/14
- ★ General relativity (4th year), 2004/05–2009/10
- ★ Cosmology (4th year), 2006/07–2009/10, 2011/12–2012/13

2013₆ – 2020₃ **Assistant professor**

2020₃ – now **Associate professor**

(Department of Physics, Faculty of Science, University of Zagreb)

- ★ Mathematical methods in physics (2nd year), 2012/13–2018/19
- ★ Classical electrodynamics (3rd year), 2018/19–
- ★ Differential geometry in physics (4th year), 2015/16–
- ★ Topology in physics (5th year), 2013/14–2014/15
- ★ Methods of modern mathematical physics
(PhD course; with Tajron Jurić), 2021/22–

Research interests

- black hole physics (thermodynamics, electrodynamics, no-hair theorems)
- mathematical physics
- quantum gravity

List of publications

31. P. Žugec, D. Horvatić and I. Smolić: *Students' confusions about the electric field of a uniformly moving charge*, Eur. J. Phys. **44** (2023) 065203 [DOI] [arXiv: 2310.19312]
30. A. Bokulić and I. Smolić: *Generalizations and challenges for the spacetime block-diagonalization*, Class. Quantum Grav. **40** (2023) 165010 [DOI] [corr] [arXiv: 2303.00764]
29. K. S. Gupta, T. Jurić, A. Samsarov and I. Smolić: *Noncommutativity and logarithmic correction to the black hole entropy*, JHEP **02** (2023) 60 [DOI] [arXiv: 2209.07168]
28. A. Bokulić, I. Smolić and T. Jurić: *Constraints on singularity resolution by nonlinear electrodynamics*, Phys. Rev. D **106** (2022) 064020 [DOI] [arXiv: 2206.07064]
27. A. Bokulić, I. Smolić and T. Jurić: *Nonlinear electromagnetic fields in strictly stationary spacetimes*, Phys. Rev. D **105** (2022) 024067 [DOI] [arXiv: 2111.10387]
26. A. Bokulić, I. Smolić and T. Jurić: *Black hole thermodynamics in the presence of nonlinear electromagnetic fields*, Phys. Rev. D **103** (2021) 124059 [DOI] [arXiv: 2102.06213]
25. E. Franzin and I. Smolić: *Stationary spacetimes with time-dependent real scalar fields*, Class. Quantum Grav. **38** (2021) 115004 [DOI] [arXiv: 2101.05816]
24. I. Smolić and B. Klajn: *Capacitance Matrix Revisited*, PIER B **92** (2021) 1–18 [DOI] [arXiv: 2007.10251]
23. A. Bokulić and I. Smolić: *Schwarzschild spacetime immersed in test nonlinear electromagnetic fields*, Class. Quantum Grav. **37** (2020) 055004 [DOI] [arXiv: 1910.04219]
22. K. S. Gupta, T. Jurić, A. Samsarov and I. Smolić: *Noncommutativity and the Weak Cosmic Censorship*, JHEP **10** (2019) 170 [DOI] [arXiv: 1908.07402]
21. I. Smolić: *Spacetimes dressed with stealth electromagnetic fields*, Phys. Rev. D **97** (2018) 084041 [DOI] [arXiv: 1711.07490]
20. I. Barjašić and I. Smolić: *On symmetry inheritance of nonminimally coupled scalar fields*, Class. Quantum Grav. **35** (2018) 075002 [DOI] [arXiv: 1709.07456]
19. L. Gulín and I. Smolić: *Generalizations of the Smarr formula for black holes with nonlinear electromagnetic fields*, Class. Quantum Grav. **35** (2018) 025015 [DOI] [arXiv: 1710.04660]
18. I. Barjašić, L. Gulín and I. Smolić: *Nonlinear electromagnetic fields and symmetries*, Phys. Rev. D **95** (2017) 124037 [DOI] [arXiv: 1705.00628]
17. I. Smolić: *Constraints on the symmetry noninheriting scalar black hole hair*, Phys. Rev. D **95** (2017) 024016 [DOI] [arXiv: 1609.04013]
16. L. Bonora, M. Cvitan, P. Dominis Prester, B. Lima de Souza and I. Smolić: *Massive fermion model in 3d and higher spin currents*, JHEP **05** (2016) 072 [DOI] [arXiv: 1602.07178]
15. M. Cvitan, P. Dominis Prester and I. Smolić: *Does three dimensional electromagnetic field inherit the spacetime symmetries?*, Class. Quantum Grav. **33** (2016) 077001 [DOI] [arXiv: 1508.03343] [CQG+]
14. I. Smolić: *Symmetry inheritance of scalar fields*, Class. Quantum Grav. **32** (2015) 145010 [DOI] [arXiv: 1501.04967]

13. I. Smolić: *On the various aspects of electromagnetic potentials in spacetimes with symmetries*, *Class. Quantum Grav.* **31** (2014) 235002 [DOI] [arXiv: 1404.1936]
12. L. Bonora, M. Cvitan, P. Dominis Prester, S. Pallua and I. Smolić: *Symmetries and gravitational Chern–Simons Lagrangian terms*, *Phys. Lett. B* **725** (2013) 468 [DOI] [arXiv: 1305.0432]
11. B. Klajn and I. Smolić: *Subtleties of invariance, covariance and observer independence*, *Eur. J. Phys.* **34** (2013) 887 [DOI] [arXiv: 1302.5338]
10. L. Bonora, M. Cvitan, P. Dominis Prester, S. Pallua and I. Smolić: *Stationary rotating black holes in theories with gravitational Chern–Simons Lagrangian term*, *Phys. Rev. D* **87** (2013) 024047 [DOI] [arXiv: 1210.4035]
9. L. Bonora, M. Cvitan, P. Dominis Prester, S. Pallua and I. Smolić: *Gravitational Chern–Simons terms and black hole entropy. Global aspects.*, *JHEP* **10** (2012) 077 [DOI] [arXiv: 1207.6969]
8. I. Smolić: *Killing horizons as equipotential hypersurfaces*, *Class. Quantum Grav.* **29** (2012) 207002 [DOI] [arXiv: 1205.1071]
7. E. Franzin and I. Smolić: *A new look at hidden conformal symmetries of black holes*, *JHEP* **09** (2011) 081 [DOI] [arXiv: 1107.2756]
6. L. Bonora, M. Cvitan, P. Dominis Prester, S. Pallua and I. Smolić: *Gravitational Chern–Simons Lagrangian terms and spherically symmetric spacetimes*, *Class. Quantum Grav.* **28** (2011) 195009 [DOI] [arXiv: 1105.4792]
5. L. Bonora, M. Cvitan, P. Dominis Prester, S. Pallua and I. Smolić: *Gravitational Chern–Simons Lagrangians and black hole entropy*, *JHEP* **07** (2011) 085 [DOI] [arXiv: 1104.2523]
4. L. Bonora, M. Cvitan, S. Pallua and I. Smolić: *Hawking fluxes, fermionic currents, $W_{1+\infty}$ algebra and anomalies*, *Phys. Rev. D* **80** (2009) 084034 [DOI] [arXiv: 0907.3722]
3. L. Bonora, M. Cvitan, S. Pallua and I. Smolić: *Hawking fluxes, W_∞ algebra and anomalies*, *JHEP* **0812** (2008) 021 [DOI] [arXiv: 0808.2360]
2. M. Cvitan, P. Dominis Prester, A. Ficnar, S. Pallua and I. Smolić: *Five dimensional black holes in heterotic string theory*, *Fortschr. Phys.* **56** (2008) 406 [DOI] [arXiv: 0711.4962]
1. M. Cvitan, P. Dominis Prester, S. Pallua and I. Smolić: *Extremal black holes in $D = 5$: SUSY vs. Gauss-Bonnet corrections*, *JHEP* **11** (2007) 043 [DOI] [arXiv: 0706.1167]

Preprints

5. A. Bokulić, E. Franzin, T. Jurić, and I. Smolić: *Lagrangian reverse engineering for regular black holes* [arXiv: 2311.17151]
4. N. Herceg, T. Jurić, A. Samsarov and I. Smolić: *Metric perturbations in Noncommutative Gravity* [arXiv: 2310.06038]
3. N. Herceg, T. Jurić, A. Samsarov, I. Smolić and K. S. Gupta: *Gravitational probe of quantum spacetime* [arXiv: 2310.06018]
2. M. Cvitan, P. Dominis Prester, S. Pallua, I. Smolić and T. Štemberga: *Parity-odd anomalies and correlation functions on conical defects* [arXiv: 1503.06196]
1. B. Mesić and I. Smolić: *Symmetry Inheritance and Jepsen-Birkhoff Theorem* [arXiv: 1407.7246]

Professional service [WoS profile]

Referee for *Physical Review D*, *Classical and Quantum Gravity*, *The European Physical Journal Plus*, *General Relativity and Gravitation*, *Symmetry*, *Entropy*, *Universe*, *Europhysics Letters*, *American Journal of Physics*

Research visits

- 4 Nov 2010 – 3 Nov 2011
postdoc at SISSA, Trieste (Italy)
host researcher: Lorianò Bonora
CERES Fellowship, research project: *Black holes, thermodynamics and topology*
- 17 Feb 2014 – 14 Mar 2014
Wigner Research Center, Budapest (Hungary)
host researcher: István RÁCz
- 9 Nov 2014 – 14 Nov 2014
Wigner Research Center, Budapest (Hungary)
host researcher: István RÁCz

Conferences and seminars

- *Symmetries and Gravitational Chern–Simons Lagrangians*
talk at the 2nd Mediterranean Conference on Classical and Quantum Gravity
Veli Lošinj (Croatia), 9 – 15 Jun 2013
- *Hidden Conformal Symmetries in the Near Horizon Region of the Black Holes*
talk at the 8th Scientific Meeting of Croatian Physical Society
Primošten (Croatia), 6 – 8 Oct 2013
- *Elusive Effects of Gravitational Chern–Simons Terms*
talk at the 4th Central European Relativity Seminar
Vienna (Austria), 27 Feb – 1 Mar 2014
- *Elusive Effects of Gravitational Chern–Simons Terms*
talk at the Wigner Research Center
Budapest (Hungary), 7 Mar 2014
- *Symmetry Inheritance of Scalar Fields*
talk at the 5th Central European Relativity Seminar
Budapest (Hungary), 26 – 28 Feb 2015
- *Symmetry inheritance, black holes and no-hair theorems*
invited talk at the Department of Physics, University of Cagliari
Cagliari (Italy), 7 Dec 2016
- *Symmetry inheritance and no-hair theorems*
talk at the 7th Central European Relativity Seminar
Bremen (Germany), 16 – 18 Feb 2017
- *Symmetry inheritance of scalar and gauge fields*
talk at the X Black Holes Workshop
Aveiro (Portugal), 18 – 19 Dec 2017

- *Thermodynamic relations for black holes with nonlinear electromagnetic fields*
invited talk at the Conference on Symmetries, Geometry and Quantum Gravity
Primošten (Croatia), 18 – 22 Jun 2018
- *Thermodynamics of black holes with nonlinear electromagnetic fields*
talk at the XI Black Holes Workshop
Lisbon (Portugal), 17 – 18 Dec 2018
- *Weyl Curvature Hypothesis*
seminar at the Institute Ruđer Bošković
Zagreb (Croatia), 14 Nov 2019
- *Black hole thermodynamics in the presence of nonlinear electromagnetic fields*
talk at the Spanish-Portuguese Relativity Meeting EREP2021
Aveiro (Portugal), 13 – 16 Sep 2021
- *Taming of singularities by nonlinear electromagnetic fields*
seminar at SISSA
Trieste (Italia), 5 Dec 2023

Theses supervised

1. Zdenko Klanfar (BSc, def. 12 February 2014):
Lagrangian and Hamiltonian Formalism in General Theory of Relativity
2. Ivan Sigmund (MSc, def. 5 September 2014):
Spinors in General Theory of Relativity
3. Benjamin Mesić (MSc, def. 11 September 2014):
Birkhoff's Theorem
4. Ivan Bažulić (MEd, def. 10 February 2016):
Experimental Tests of General Theory of Relativity
5. Barbara Šoda (MSc, def. 19 July 2016):
Thermodynamics and Symmetries in the Near-Horizon Region of Black Holes
6. Mateo Paulišić (MSc, def. 20 July 2016):
Spacetime Singularities
7. Suzana Bedić (MSc, def. 25 August 2016):
Black Hole Hair
8. Irena Barjašić (MSc, def. 13 July 2017):
Symmetry Inheritance
9. Luka Gulin (MSc, def. 7 September 2017):
Black Hole Electrodynamics

10. Ana Bokulić
MSc, def. 27 August 2019: *Ergoregions*
PhD, def. 5 March 2024: *Thermodynamics and Geometry of Black Holes
in the Presence of Nonlinear Electromagnetic Fields*
11. Mate Picukarić (MSc, def. 25 September 2020):
Geometric Inequalities in General Relativity
12. Kaja Krhač (MSc, def. 22 February 2021):
Emergent Gravitation
13. Mario Tanfara (MSc, def. 25 February 2022):
Cosmological Singularities in the Path Integral Approach
14. Lovro Dulibić (MSc, def. 23 September 2022):
Quasinormal Modes of Black Holes
15. Fran Ilčić (MSc, def. 20 February 2023):
Gravitational Waves in Spacetime with Positive Cosmological Constant
16. Luka Benić (MSc, def. 19 September 2023):
Teleparallel Gravitation
17. Ema Kompar (MSc, def. 22 September 2023):
Bounds on Compactness of Astrophysical Bodies