

Sanjin Benić - Curriculum Vitae

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Physics Department, Zagreb University, Bijenička c. 32, Zagreb 10000, Croatia
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Born August 21, 1982, Pula, Croatia
Married, two children (b. 2017 and 2020)

Research experience

11/2019 - present Assistant Professor at Department of Physics, Faculty of Science, University of Zagreb, Croatia

11/2017 - 11/2019 Postdoctoral Researcher at the Yukawa Institute for Theoretical Physics, Kyoto University, Japan

11/2016 - 11/2017 Postdoctoral Researcher at the Department of Physics, Faculty of Science, University of Zagreb, Croatia

11/2014 - 11/2016 Postdoctoral Researcher at the Physics Department, University of Tokyo, Japan

01/2009 - 11/2014 Research/Teaching Assistant at the Department of Physics, Faculty of Science, University of Zagreb, Croatia

Education

12/2013 PhD Thesis “Dynamical quark loops at low energies and in medium”
advisor: Prof. D. Klabučar

03/2009 - 07/2013 Graduate Study at the Department of Physics, Faculty of Science, University of Zagreb, Croatia
direction: Particle Physics

05/2008 Diploma/Master Thesis “Some Anomalous Processes of Pseudoscalar Hadrons”
advisor: Prof. D. Klabučar

10/2000 - 07/2007 Undergraduate/master Study at the Department of Physics, Faculty of Science, University of Zagreb, Croatia
direction: Theoretical Physics

Awards and grants

12/2019 HRZZ startup project (5 years)

11/2017 JSPS postdoctoral research fellowship (2 years)

11/2014 Marie Curie NEWFELPRO postdoctoral research fellowship (3 years)

10/2008 Oäd research Grant (5 months)

Community service

Referee for Physical Review D, European Journal of Physics A, Astronomy and Astrophysics

Research interests

High energy collisions, perturbative QCD, proton structure, small-x, spin physics

List of publications

23. **S. Benić** and Y. Hatta, H. N. Li, D. Y. Yang, *Single spin asymmetry at two loops*, Phys. Rev. D **100** (2019), 094027.
22. **S. Benić** and Y. Hatta, *Single spin asymmetry in forward pA collisions: Phenomenology at RHIC*, Phys. Rev. D **99** (2019) no.9, 094012.
21. **S. Benić**, K. Fukushima, O. Garcia-Montero and R. Venugopalan, *Constraining unintegrated gluon distributions from inclusive photon production in proton-proton collisions at the LHC*, Phys. Lett. B **791** (2019) 11.
20. **S. Benić** and Y. Hatta, *Single spin asymmetries in ultra-peripheral $p^\dagger A$ collisions*, Phys. Rev. D **98** (2018) no.9, 094025.
19. **S. Benić** and A. Dumitru, *Prompt photon - jet angular correlations at central rapidities in $p+A$ collisions*, Phys. Rev. D **97** (2018) 014012.
18. **S. Benić**, K. Fukushima, O. Garcia-Montero and R. Venugopalan, *Probing gluon saturation with next-to-leading order photon production at central rapidities in proton-nucleus collisions*, JHEP **1701** (2017) 115.
17. **S. Benić** and K. Fukushima, *Photon from the annihilation process with CGC in the pA collision*, Nucl. Phys. A **958** (2017) 1.
16. D. Alvarez-Castillo, **S. Benić**, D. Blaschke, S. Han and S. Typel, *Neutron star mass limit at $2M_\odot$ supports the existence of a CEP*, Eur. Phys. J. A **52** (2016) no.8, 232.
15. D. Alvarez-Castillo, A. Ayriyan, **S. Benić**, D. Blaschke, H. Grigorian and S. Typel, *New class of hybrid EoS and Bayesian M-R data analysis*, Eur. Phys. J. A **52** (2016) 3, 69.
14. **S. Benić** and A. Yamamoto, *Quantum Monte Carlo simulation with a black hole*, Phys. Rev. D **93** (2016) 9, 094505.
13. **S. Benić**, I. Mishustin and C. Sasaki, *Effective model for the QCD phase transitions at finite baryon density*, Phys. Rev. D **91** (2015) 12, 125034.
12. **S. Benić**, D. Blaschke, D. E. Alvarez-Castillo, T. Fischer and S. Typel, *A new quark-hadron hybrid equation of state for astrophysics - I. High-mass twin compact stars*, Astron. Astrophys. **577** (2015) A40.

11. **S. Benić**, B. Radovčić, *Majorana dark matter in a classically scale invariant model*, JHEP **1501** (2015) 143.
10. **S. Benić**, D. Horvatić, D. Kekez and D. Klabučar, *A $U_A(1)$ symmetry restoration scenario supported by the generalized Witten-Veneziano relation and its analytic solution*, Phys. Lett. B **738** (2014) 113.
9. N. Yasutake, R. Lastowiecki, **S. Benić**, D. Blaschke, T. Maruyama and T. Tatsumi, *Finite-size effects at the hadron-quark transition and heavy hybrid stars*, Phys. Rev. C **89** (2014) 065803.
8. **S. Benić**, *Heavy hybrid stars from multi-quark interactions*, Eur. Phys. J. A **50** (2014) 111.
7. B. Radovčić and **S. Benić**, *Electroweak breaking and Dark Matter from the common scale*, Phys. Lett. B **732** (2014) 91.
6. **S. Benić**, D. Horvatić and J. Klarić, *Recovering the chiral critical endpoint via delocalization of quark interactions*, Phys. Rev. D **89** (2014) 054025.
5. **S. Benić**, D. Blaschke, G. A. Contrera and D. Horvatić, *Medium induced Lorentz symmetry breaking effects in nonlocal PNJL models*, Phys. Rev. D **89** (2014) 016007.
4. **S. Benić**, *Physical interpretation of the dressed Polyakov loop in the Nambu–Jona-Lasinio model*, Phys. Rev. D **88** (2013) 077501.
3. **S. Benić**, D. Blaschke and M. Buballa, *Thermodynamic Instabilities in Dynamical Quark Models with Complex Conjugate Mass Poles*, Phys. Rev. D **86** (2012) 074002.
2. **S. Benić** and D. Klabučar, *Axial anomaly and the interplay of quark loops with pseudoscalar and vector mesons in the $\gamma^* \rightarrow \pi^+\pi^0\pi^-$ process*, Phys. Rev. D **85** (2012) 034042.
1. **S. Benić**, D. Horvatić, D. Kekez and D. Klabučar, *η' Multiplicity and the Witten-Veneziano relation at finite temperature*, Phys. Rev. D **84** (2011) 016006.

Research visits

05. 10. 2014 – 25. 10. 2014. New CompStar STSM grant, Frankfurt Institute for Advanced Studies (*Frankfurt, Germany*)
03. 07. 2014 – 18. 07. 2014. New CompStar STSM grant, Wrocław University (*Wrocław, Poland*)
19. 02. 2014 – 28. 02. 2014. Croatian Mobility Grant, Frankfurt Institute for Advanced Studies (*Frankfurt, Germany*)
01. 10. 2008 – 28. 02. 2009. Öad Grant, University of Vienna (*Vienna, Austria*)

Teaching

2019 – present *Mathematical methods of physics 1, 2, Group theory, Symmetries in physics*

2009 – 2014 *Quantum mechanics, Relativistic quantum mechanics* (ex.)

2009 – 2010 *Selected chapters of nuclear physics and particle physics* (ex.)

2011 – 2014 *Mathematical methods of physics* (ex.)

Talks and posters

2019

09. 10. - 12. 10. 40th Max Born Symposium (*Wrocław, Poland*) (talk: Photon production in high energy p+A collisions as a probe of Color Glass Condensate)

27. 08. - 30. 08. 11th Circum-Pan-Pacific Symposium on High Energy Spin Physics (*Miyazaki, Japan*) (talk: Single spin asymmetry in forward pA collisions: phenomenology at RHIC)

08. 01. - 11. 01. XXV Epiphany, Advances in Heavy Ion Physics (*Krakow, Poland*) (talk: Single spin asymmetry in forward pA collisions: phenomenology at RHIC)

2018

11. 11. - 17. 11. INT-18-3 Workshop, Probing Nucleons and Nuclei in High Energy Collisions (*Seattle, USA*) (talk: CGC photon production at NLO in pA collisions)

16. 04. - 20. 04. YKIS2018b Symposium, Recent Developments in Quark-Hadron Sciences (*Kyoto, Japan*) (talk: Single spin asymmetries in ultra-peripheral pA collisions)

16. 04. - 20. 04. XXVI International Workshop on Deep Inelastic Scattering and Related Subjects (*Kobe, Japan*) (talk: Exploring gluon saturation with photons in high energy hadron-hadron collisions)

19. 03. - 23. 03. 8th International Conference on Physics Opportunities at an ElecTron-Ion-Collider (*Regensburg, Germany*) (talk: Photon jet angular correlations in p+A collisions at central rapidities)

2017

02. 10. - 05. 10. 12th International Workshop on high- pT physics in the RHIC/LHC era (*Bergen, Norway*) (talk: Saturation physics with prompt photons at NLO in p+A collisions)

26. 09. - 29. 09. Compact Stars in the QCD phase diagram VI (*Dubna, Russia*) (talk: EoS for dense matter with a QCD phase transition)

2016

23. 09. - 27. 09. Hard Probes (*Wuhan, China*) (talk: Photon from the Color Glass Condensate in the pA collisions)

29. 08. – 02. 09. International Symposium on Multiparticle Dynamics (*Jeju Island, South Korea*)
(talk: Photon from the Color Glass Condensate in the pA collision)

2015

24. 08. – 18. 09. The many faces of neutron stars (*Munich, Germany*)
(talk: Effective model of QCD phase transitions at finite density)

07. 09. – 26. 09. Selected topics in the physics of the Quark-Gluon Plasma and Ultrarelativistic Heavy Ion Collisions (*Kyoto, Japan*)
(poster: Photon in pA in CGC)

2014

26. 09. – 30. 09. Compact Stars in the QCD phase diagram IV (*Prerow, Germany*)
(talk: Multi-quark interactions and heavy hybrid stars)

2013

03. 02. – 09. 02. Excited QCD (*Sarajevo, Bosnia and Herzegovina*)
(talk: Mesonic correlations in non-local NJL model-status report)

14. 04. – 24. 05. Doctoral Training Programme (*Trento, Italy*)
(talk: Heavy hybrid stars in non-local PNJL model)

27. 06. – 28. 06. Austria-Croatia-Hungary-Triangle Workshop (*Bildungshaus Schloss Retzhof, Leirring, Austria*)
(talk: Heavy hybrid stars in non-local PNJL model)

14. 06. – 16. 06. 31st Max Born Symposium (*Wroclaw, Poland*)
(talk: Hybrid stars from lattice constrained nonlocal PNJL model)

30. 08. – 04. 09. Summer workshop for theoretical physics (*Rab, Croatia*)
(talk: Physical interpretation of the dressed Polyakov loop in the NJL model)

18. 11. – 20. 12. New Frontiers in QCD (*Kyoto, Japan*)
(talk: Non-local chiral quark models in medium - a case study)

2012

04. 02. – 11. 02. 48th Karpacz Winter School of Theoretical Physics (*Laddek Zdroj, Poland*)
(talk: Thermodynamic instability in non-local chiral quark models)

13. 04. – 15. 04. 30th Max Born Symposium (*Wroclaw, Poland*)

28. 08. – 08. 09. Helmholtz International Summer School (*Dubna, Russia*)
(talk: Thermodynamic instabilities in non-local chiral quark models)

24. 09. – 28. 09. CompStar School (*Zadar, Croatia*)
(talk: Covariant non-local NJL models at finite μ : some results and applications for hybrid stars)

18. 12. – 20. 12. Mini-Symposium (*Wroclaw, Poland*)
(talk: Mesonic correlations in non-local NJL model-status report)

2011

03. 05. – 12. 05. Compstar School and Workshop (*Catania, Italy*)
(talk: Restoration of the $U(1)_A$ symmetry in hot strongly interacting matter)