

# Prof. Dr. Benjamin Koch

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## LIST OF PUBLICATIONS

### Publications in International Journals

1. *Hidden Photons in Aharonov-Bohm-Type Experiments*  
Paola Arias, Christian Diaz, Marco Aurelio Diaz, Joerg Jaeckel, Benjamin Koch,  
and Javier Redondo;  
accepted by **PRD**, 2016;  
[arXiv:1603.01282].
2. *On the Possibility of Non-Geodesic Motion of the Massless Spinning Top*  
Cristobal Armaza, Sergio A. Hojman, Benjamin Koch, and Nicolas Zalaquett;  
**Class.Quant.Grav.****33:145011**, 2016;  
[arXiv:1601.05809].
3. *Collisions of spinning massive particles in a Schwarzschild background;*  
Cristobal Armaza, Maximo Bañados, and Benjamin Koch;  
**Class.Quant.Grav.****33:105014**, 2016;  
[arXiv:1510.01223].
4. *Constraints to Dark Matter from Inert Higgs Doublet Model;*  
Marco Aurelio Díaz, Benjamin Koch, and Sebastin Urrutia-Quiroga;  
**AHEP.vol.2016 Article.ID.8278375**, 2016;  
[arXiv:1511.04429].
5. *Black hole solutions for scale dependent couplings:  
The de Sitter and the Reissner-Nordström case;*  
Benjamin Koch and Paola Rioseco;  
**Class.Quant.Grav.****33:035002**, 2016;  
[arXiv:1501.00904].
6. *Differentiable Path Integrals in Quantum Mechanics;*  
Benjamin Koch and Ignacio Reyes;  
**Int.J.Geom.Meth.Mod.Phys.vol.12.issue.09;**  
**DOI:10.1142/S0219887815501005**, 2015;  
[arXiv:1404.6551].

7. *Scale setting for self-consistent backgrounds;*  
Benjamin Koch, Paola Rioseco, and Carlos Contreras;  
**Phys.Rev.D91:025009**, 2015;  
[arXiv:1409.4443].
8. *On the integration of fields and quanta in time dependent backgrounds;*  
Esteban Castillo, Benjamin Koch, and Gonzalo Palma;  
**JHEP 1405:111**, 2014;  
[arXiv:1312.3338].
9. *Black holes within asymptotic safety;*  
Benjamin Koch and Frank Saueressig;  
**IJMPA.vol.29.issue.8**, 2014;  
[arXiv:1401.4452].
10. *An angular formalism for spin one half;*  
Benjamin Koch and Nicolás Rojas;  
**Int.J.Geom.Meth.Mod.Phys.vol.11.issue.04**, 2014;  
DOI: 10.1142/S0219887814500297.
11. *Closing a window for massive photons;*  
Sergio A. Hojman and Benjamin Koch;  
**AHEP.vol.2013 Article.ID.967805**, 2013;  
[arXiv:1209.4907].
12. *Structural aspects of asymptotically safe black holes;*  
Benjamin Koch and Frank Saueressig;  
**Class.Quant.Grav.31:015006**,2013;  
[arXiv:1306.1546].
13. *Exact black hole solution for scale dependent gravitational couplings and the corresponding coupling flow;*  
Carlos Contreras, Benjamin Koch, Paola Rioseco;  
**Class.Quantum Grav.30:175009**,2013;  
[arXiv:1303.3892].
14. *Higher dimensional geometric description of the Quantum Klein Gordon Equation;*  
Benjamin Koch;  
**Int.J.Geom.Meth.Mod.Phys.10:1320014**, 2013;  
DOI: 10.1142/S0219887813200144
15. *Nondiagonal charged lepton Yukawa matrix: Effects on neutrino mixing in supersymmetry*  
Giovanna Cottin, Marco Aurelio Díaz, and Benjamin Koch;  
**Phys.Rev.D85:095019**, 2012;  
[arXiv:1112.6351].

16. *Gravitino dark matter and neutrino masses in partial split supersymmetry*;  
 Marco Aurelio Díaz, Sebastián García Sáenz, and Benjamin Koch;  
**Phys.Rev.D84:055007**, 2011;  
 [arXiv:1106.0308].
17. *Exact renormalization group with optimal scale and its application to cosmology*;  
 Benjamin Koch, Israel Ramirez;  
**Class.Quant.Grav.28:055008**, 2011;  
 [arXiv:1010.2799].
18. *Renormalization group improved black hole space-time in large extra dimensions*;  
 Thomas Burschil, Benjamin Koch;  
**JETP Lett.92:4**, 2010;  
 [arXiv:0912.4517].
19. *Explaining Solar Neutrinos  
 with Heavy Higgs Masses in Partial Split Supersymmetry*;  
 Marco Aurelio Díaz, Benjamin Koch, Francisca Garay;  
**Phys.Rev.D80:113005**, 2009;  
 [arXiv:0918.2987].
20. *Gravity Effects on Neutrino Masses in Split Supersymmetry*;  
 Marco Aurelio Díaz, Benjamin Koch, Boris Panes;  
**Phys.Rev.D79:113009**, 2009;  
 [arXiv:0902.1720].
21. *Exclusion of black hole disaster scenarios at the LHC*;  
 Benjamin Koch, Marcus Bleicher, Horst Stöcker;  
**Phys.Lett.B672:71**, 2009;  
 [arXiv:0807.3349].
22. *Renormalization group and black hole production in large extra dimensions*;  
 Benjamin Koch;  
**Phys.Lett.B663:334**, 2008;  
 [arXiv:0707.4644].
23. *Gravitational radiation from elastic particle scattering  
 in models with extra dimensions*;  
 Benjamin Koch, Marcus Bleicher;  
**JETP Lett.87:75**, 2008;  
 [hep-th/0512353].
24. *First Order Calculation of the Inclusive Cross Section  $pp$  to  $ZZ$   
 by Graviton Exchange in Large Extra Dimensions*;  
 Martin Kober, Benjamin Koch, Marcus Bleicher;  
**Phys.Rev.D76:125001,2007**, 2007;  
 [arXiv:0708.2368].

25. *The Gravitational analogue to the hydrogen atom. A summer study at the borders of quantum mechanics and general relativity;*  
Martin Kober, Benjamin Koch, Marcus Bleicher;  
**J-Phys.E.28:465**, 2007;  
[arXiv:physics/0703064].
26. *Gravitational Radiation from Ultrahigh Energy Cosmic Rays in Models with Large Extra Dimensions;*  
Benjamin Koch, Hans Joachim Drescher, Marcus Bleicher;  
**Astropart.Phys.25:291**, 2006;  
[arXiv:astro-ph/0602164].
27. *Black Hole Remnants at the LHC;*  
Benjamin Koch, Marcus Bleicher, Sabine Hossenfelder;  
**JHEP 0510:053**, 2005;  
[arXiv:hep-ph/0507138].

## Publications in Conference Proceedings

28. *Setting the Renormalization Scale in QFT*  
Carlos Contreras, Benjamin Koch, and Paola Rioseco;  
Proceedings del XIII Simposio Chileno de Física; Concepcion, Chile;  
**J.Phys.Conf.Ser. 720, no.1, 012020** , 2016.
29. *The bending of light within gravity with large scale renormalization group effects*  
Davi Rodrigues, Benjamin Koch, Oliver Piattella, and Ilya Shapiro;  
Verao Cuantico;  
Valparaiso, Chile;  
**AIP Conf. Proc. 1647:57**, 2015.
30. *Black holes and running couplings: A comparison of two complementary approaches*  
Benjamin Koch, Carlos Contreras, Paola Rioseco, and Frank Saueressig;  
Karl Schwarzschild Meeting;  
Frankfurt, Germany;  
**C13-07-22.2**, 2013.
31. *Non-diagonal Charged Lepton Yukawa Matrix: Effects on Neutrino Mixing in Supersymmetry*  
Giovanna Cottin, Marco Aurelio Díaz, and Benjamin Koch;  
FLASY 2011;  
Valencia, Spain;  
**C11-07-11.1**, 2012.
32. *Quantizing Geometry or Geometrizing the Quantum?*  
Benjamin Koch;  
Quantum Theory Reconsideration of Foundations 5;  
Vaxjo, Sweden;  
**AIP Conf.Proc.1232:313**, 2010.
33. *Geometrizing the Quantum - a toy model*  
Benjamin Koch;  
13th Max Born Symposium;  
Wroclaw, Poland;  
**AIP Conf.Proc.1196:161**, 2009.

34. *Heavy Ion Collisions at the LHC - Last Call for Predictions*;  
N. Armesto, (ed.) et al.;  
Workshop on Heavy Ion Collisions at the LHC: Last Call for Predictions;  
Geneva, Switzerland;  
**J.Phys.G35:054001**, 2008;  
[arXiv:0711.0974].
35. *Early black hole signals at the LHC*;  
Benjamin Koch, Marcus Bleicher, Horst Stöcker;  
7th Latin American Symposium on Nuclear Physics and Applications;  
Cusco, Peru;  
**AIP Conf.Proc.947:376**, 2007.
36. *An introduction to mini black holes at LHC*;  
Horst Stöcker, Benjamin Koch, Marcus Bleicher;  
36th International Symposium on Multiparticle Dynamics,  
Rio de Janeiro, Brazil;  
**Braz.J.Phys.37:836**, 2007.
37. *Black Holes at LHC?*  
Benjamin Koch, Marcus Bleicher, Horst Stöcker;  
Quark matter;  
Shanghai;  
**J.Phys.G34:535**, 2007;  
[arXiv:hep-ph/0702187].
38. *Black Holes and Qasistable Remnants at the LHC*;  
Benjamin Koch, Marcus Bleicher, Sabine Hossenfelder;  
Fundamental Interactions;  
Lake Louise, Canada;  
**Fund.Interactions.21:235**, 2006.
39. *Towards a Realistic MSSM Prediction for Neutrino-nucleon Deep-inelastic Scattering*;  
Oliver Brein, Wolfgang Hollik, Benjamin Koch;  
14th International Conference on Supersymmetry and the Unification of Fundamental Interactions; Irvine, USA;  
**IPPP-06-74**, 2006;  
[arXiv:hep-ph/0611033].
40. *Signatures for Black Hole Production from Hadronic Observables at the Large Hadron Collider*;  
Thomas J. Humanic, Benjamin Koch, Horst Stöcker;  
International Symposium on Heavy Ion Physics (ISHIP);  
Frankfurt, Germany;  
**Int.J.Mod.Phys.E16:841**, 2006  
[arXiv:hep-ph/0607097].
41. *Mini Black Holes at the LHC: Discovery through Di-jet Suppression, Mono-jet Emission and a Supersonic boom in the Quark-gluon Plasma in ALICE, ATLAS*

*and CMS;*

B. Betz, Marcus Bleicher, U. Harbach, T. Humanic, B. Koch, H. Stöcker;  
22nd Winter Workshop on Nuclear Dynamic;  
La Jolla, USA, 2006;  
[arXiv:hep-ph/0606193].

42. *Large Extra Dimensions and the Minimal Scale Constraints through High Precision Experiments;*  
U. Harbach, B. Koch, Marcus Bleicher, S. Hossenfelder;  
Annual Meeting of the Division of Particles and Fields;  
Riverside, California, USA;  
**Int.J.Mod.Phys.A20:3334**, 2005.
43. *Radiative Corrections to Deep-inelastic Neutrino-nucleon Scattering in the MSSM;*  
Oliver Brein, Wolfgang Hollik, Benjamin Koch;  
International Conference on Linear Colliders (LCWS 2004);  
Paris, France;  
[arXiv:hep-ph/0408331].

### Submitted Publications

44. *A scale dependent black hole in three-dimensional space-time;*  
Benjamin Koch, Ignacio A. Reyes, and Ángel Rincón;  
Submitted, 2016;  
[arXiv:1606.04123].
45. *Improved Reissner-Nordström-(A)dS Black Hole in Asymptotic Safety;*  
Cristopher González and Benjamin Koch;  
Submitted, 2015;  
[arXiv:1508.01502].
46. *On the dynamics of fluctuations in time crystals;*  
Esteban Castillo, Benjamin Koch, and Gonzalo Palma;  
Submitted, 2014;  
[arXiv:1410.2261].