

# Oleksandr Gituliar, PhD

+48 530 824642  
✉ [oleksandr@gituliar.net](mailto:oleksandr@gituliar.net)

Date of birth: 7 April 1987

Place of birth: Dnipro (Ukraine)

Nationality: Ukrainian

Family: married, 1 child

Current city: Hamburg (Germany)

Languages: English (very good), Polish (fluent), Russian and Ukrainian (native)

Hobby: sport climbing (RP – 7a+, OS – 6c), homebrewing

Education: theoretical physicist

## Academic Positions

2016.10 – present **postdoc**, [Hamburg University](#), Hamburg (Germany).

2015.01 – 2016.09 **postdoc**, [The PAS Institute of Nuclear Physics](#), Krakow (Poland).

2014.04 – 2014.12 **postdoc**, [German Electron Synchrotron \(DESY\)](#), Zeuthen (Germany).

## Skills

Physics: **Perturbative Quantum Field Theories, Feynman Integrals Calculus.**

Mathematics: **Mathematical Analysis, Differential Equations, Integral Calculus, Linear Algebra, Symbolic and Numerical Computation, Monte-Carlo Simulation.**

Computer: **Python, C, Mathematica, Linux, Git,**  
(also moderate C++, Go, JavaScript, LISP/Scheme, Asm/x64).

Personal: **sanguine, commitment, openness, willing to learn, social skills.**

## Software

**Fuchsia** — an open-source program for reducing differential equations for Feynman master integrals to an epsilon form, *Comput.Phys.Commun.* **219 (2017) 329-338.**

## Other Positions

2012.03 – 2013.12 **software developer** (part-time), [Cracow Cloud One](#), Krakow (Poland), Python (REST, WSGI, Amazon API).

2010.10 – 2012.12 **software developer** (part-time, remote), [Cloudbreach Ltd](#), Python (Google App Engine, Django, Boto, Google Domains), JavaScript (Google Closure), Selenium.

2009.01 – 2009.05 **teacher** (part-time, high-school), Dnipro (Ukraine), *Lyceum of Information Technologies.*  
Class: Introduction to Python.

2007.03 – 2009.10 **test engineer** (part-time), [Ultimate Risk Solutions](#), Dnipro (Ukraine), Excel/VBA, IBM Rational Robot (IBM SQABasic).

**Role:** create and verify reinsurance risk models, develop automated tests, report bugs.

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## Teaching

2017.03.23 **Introduction to Differential Equations,**  
*Computer Algebra and Particle Physics 2017*, Hamburg (Germany).

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## Education

- 2009.10 – 2014.06 **PhD in Particle Physics,** *The PAS Institute of Nuclear Physics*, Krakow (Poland).  
Thesis: *Higher-order corrections in QCD evolution equations and tools for their calculation.*  
Supervisors: prof. dr hab. M. Skrzypek and dr A. Kusina.
- 2004.09 – 2009.06 **MSc in Theoretical Physics,** *Dnipro National University*, Dnipro (Ukraine).  
Thesis: *Heavy neutral vector boson search in the LHC experiment.*  
Supervisor: dr O.V. Gulov.

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## Prizes

- 2004 **3rd place** Dnipro Region Contest in Physics  
**1st place** Dnipro City Olympiad in Programming  
**3rd place** Dnipro City Olympiad in Mathematics
- 2003 **3rd place** Dnipro City Olympiad in Programming  
**3rd place** Dnipro City Olympiad in Mathematics

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## Publications (selected list)

- [arXiv:1701.04269](#) **O. Gituliar and V. Magerya,**  
*Fuchsia: a tool for reducing differential equations for Feynman master integrals to epsilon form,*  
*Comput.Phys.Commun.* **219** (2017) 329-338.
- [arXiv:1512.02045](#) **O. Gituliar,**  
*Master integrals for splitting functions from differential equations in QCD,*  
*JHEP* **1602** (2016) 017.
- [arXiv:1511.08439](#) **O. Gituliar, M. Hentschinski, K. Kutak,**  
*Transverse-momentum-dependent quark splitting functions in  $k_t$ -factorization: real contributions,*  
*JHEP* **1601** (2016) 181.
- [arXiv:1505.02901](#) **O. Gituliar, S. Moch,**  
*Towards three-loop QCD corrections to the time-like splitting functions,*  
*Acta Phys.Polon.* **B46, 1279** (2015).
- [arXiv:1403.6897](#) **O. Gituliar (PhD thesis),**  
*Higher-Order Corrections in QCD Evolution Equations and Tools for Their Calculation.*
- [arXiv:1401.5087](#) **O. Gituliar, S. Jadach, A. Kusina, M. Skrzypek,**  
*On regularizing the infrared singularities in QCD NLO splitting functions with the new Principal Value prescription,*  
*Phys. Lett.* **B732, 218** (2014).

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## Conference Talks

- 2018-01-13 **Fuchsia and differential equations for multi-scale master integrals,**  
*FCC Mini Workshop,*  
Geneva (Switzerland).
- 2017-09-26 **Fuchsia and master integrals for energy-energy correlations at NLO in QCD,**  
*Radcor,* [arXiv:1711.05549](#),  
St. Gilgen (Austria).

## Conference Talks (continue)

- 2017.09.07 **Fuchsia and master integrals for energy-energy correlations at NLO in QCD**, *Matter to the Deepest*, [arXiv:1711.05549](#), Podlesice (Poland).
- 2016.09.28 **Constructing epsilon form of differential equations for master integrals with Fuchsia**, *Rethinking Quantum Field Theory*, Hamburg (Germany).
- 2016.04.26 **Fuchsia and master integrals for splitting functions from differential equations in QCD**, *Loops and Legs in Quantum Field Theory*, [PoS LL2016 \(2016\) 030](#), Leipzig (Germany).
- 2016.01.07 **Splitting functions for high-energy factorization at leading order**, *Cracow Epiphany Conference*, [Acta Phys.Polon. B47 \(2016\) 1667-1675](#), Krakow (Poland).
- 2015.06.15 **Towards three-loop QCD corrections to the time-like splitting functions**, *Radcor-Loopfest Symposium 2015*, [PoS RADCOR2015 \(2016\) 017](#), Los Angeles (USA).
- 2015.01.10 **Towards three-loop QCD corrections to the time-like splitting functions**, *Cracow Epiphany Conference 2015*, [Acta Phys.Polon. B46 \(2015\) no.7, 1279-1289](#), Krakow (Poland).
- 2014.11.26 **Higher-Order Corrections in QCD Evolution Equations and Tools for Their Calculation**, *LHCPhenoNet Meeting 2014*, Berlin (Germany).
- 2014.06.05 **Higher-Order Corrections in QCD Evolution Equations and Tools for Their Calculation**, *LHCPhenoNet Workshop on Particle Physics 2014*, Paris (France).
- 2014.01.09 **Calculation of QCD NLO Splitting Functions in the light-cone gauge: a new regularization prescription**, *Cracow Epiphany Conference 2014*, [Acta Phys.Polon. B45 \(2014\) no.7, 1361](#), Krakow (Poland).
- 2013.09.06 **Virtual Corrections to the NLO Splitting Functions for Monte Carlo: non-singlet case**, *Matter to the Deepest Conference 2013*, [Acta Phys.Polon. B44 \(2013\) no.11, 2197-2206](#), Ustron (Poland).
- 2013.01.09 **Automatic Calculation of NLO Kernels with Loops for Exclusive Monte-Carlo**, *Cracow Epiphany Conference 2013*, [Acta Phys.Polon. B44 \(2013\) no.7, 1469-1479](#), Krakow (Poland).
- 2012.09.05 **Axiloop: a Tool for the Symbolic Calculation of Splitting Kernels at Higher Orders**, *High Precision for Hard Processes (HP2) Workshop 2012*, Munich (Germany).
- 2009.07.01 **Cross Section of Processes which Involve Z' Boson**, *Trans-European School of High-Energy Physics 2009*, Zakopane (Poland).