Nicolas Deutschmann

Personal information

Nationality : French
Age : 24

Contact

Domaine scientifique de la Doua
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Bâtiment Paul Dirac
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Publications

Number : 4
h-index : 2

Languages

French : Mother tongue
English : fluent
German & Spanish : basic conversation

Research experience

Since September 2013 — **PhD Student** — IPN Lyon, France & CP3 Louvain, Belgium
Model building and phenomenology for the LHC
With Aldo Deandrea and Fabio Maltoni
Research interests
- Collider phenomenology of extra-dimensions
- Kaluza-Klein Dark Matter in curved extra-dimensions
- Precision Higgs physics
- Multi-loop calculations

April–July 2013 — **Master thesis** — IPN Lyon, France
Effective Models with Spherical Orbifolds
with Aldo Deandrea
Defended in August 2013 – final grade : 18.25/20

May–July 2012 — **Master internship** — CP3 Louvain-la-Neuve, Belgique
Trileptons at the LHC, in the Standard Model and beyond
with Fabio Maltoni
Defended in August 2012 – final grade : 18.5/20

Education

2011–2013 — **Master's degree in physics** — École normale supérieure de Lyon, France
Theoretical Physics
Highest honors

2010–2011 — **Bachelor's degree in physics** — École normale supérieure de Lyon, France
Highest honors

2008–2010 — **Classe préparatoire aux grandes écoles** — Lycée Kléber, Strasbourg, France
French intensive 2-year undergraduate program
Mathematics and Physics

Publications

2016 — **Towards Kaluza-Klein Dark Matter on nilmanifolds**
ArXiv : 1603.02289
Accepted for publication in JHEP
D. Andriot, G. Cacciapaglia, A. Deandrea, N. Deutschmann, D. Tsimpis

2016 — **Dark matter and localised fermions from spherical orbifolds ?**
JHEP 1604 (2016) 083
G. Cacciapaglia, A. Deandrea, N. Deutschmann

2014 — **Multi-tops at the LHC**
JHEP 1408 (2014) 134
A. Deandrea, N. Deutschmann

2013 — **Simulating spin-$3/2$ particles at colliders**
European Physical Journal C73 (2013) 2580
N. D. Christensen, P. de Aquino, N. Deutschmann, C. Duhr, B. Fuks, C. Garcia-Cely, O. Mattelaer, K. Mawatari, B. Oexl, Y. Takaesu

Conferences & seminars

26 january 2016 — **Dark Matter from Spherical Extra-Dimensions with Localized Fermions ?** – 15 min presentation — LAPTh Annecy, France
Rencontres de Physique des Particules 2016

22 July 2014 — **Curved extra-dimensions** – 1h presentation — NIThePWITS, South Africa
Invited seminar

20 january 2014 — **Curved Extra Dimensions** – 15 min presentation — IPHC Strasbourg, France
Rencontres de Physique des Particules 2014

Skills

Particle Phenomenology — Madgraph5_aMC@NLO, FeynRules, MadAnalysis5, CalcHEP

- Monte Carlo collider simulations
- Efficient BSM model implementation
- Recasting complex collider analyses
- Dark Matter relic density calculations with coannihilations

Multi-loop computations — Mathematica, LiteRed, FIRE5, ASY, FIESTA, QGRAF, FORM

- Generating and reducing multi-loop amplitudes using Integration-By-Parts identities
- Modern methods for direct loop integrations (multiple polylogarithms, coproducts,...)
- Expansion methods for EFT matching (expansion by region)
- Learning modern methods for integral evaluation (Differential equations, canonical bases,...)

Programming — Python, C, C++, SQL, XML

- Modelling physical systems for intensive computations
- Data analysis, statistics
- Handling abstract data for physics applications

General computer skills — Git, LaTeX, HTML, CSS, Bootstrap, Pelican, General bureautics

- Maintaining clean codes for collaborative work
- Producing professional document efficiently and reliably
- Responsive webpage creation for informational pages or content-publishing sites

Graduate-level training

October 2015 — **School of Analytic Computing in Theoretical High-Energy Physics** — Atrani, Italy

August 2015 — **MCnet School** — Spa, Belgium

June 2015 — **HiggsTools Annual School** — Courmayeur, Italy

Juin 2014 — **TASI** — University of Colorado, Boulder, USA

Avril 2013 — **School on Particle Physics in the LHC Era** — ICTP-SAIFR, São Paulo, Brazil

Octobre 2012 — **The 2012 FeynRules/MadGraph School on LHC Phenomenology** — Natal, Brazil