

# 20 Publications

## 20.1 Elementary particles and their interactions

### 20.1.1 Theory of Elementary particles

#### Articles

- The forward-backward asymmetry for massive bottom quarks at the  $Z$  peak at next-to-next-to-leading order QCD  
Bernreuther, Werner and Chen, Long and Dekkers, Oliver and Gehrmann, Thomas and Heisler, Dennis, JHEP **01** (2017) 053.
- NNLO QCD corrections for Drell-Yan  $p_T^Z$  and  $\phi^*$  observables at the LHC  
Gehrmann-De Ridder, A. and Gehrmann, T. and Glover, E. W. N. and Huss, A. and Morgan, T. A., JHEP **11** (2016) 094.
- NNLO QCD corrections to Higgs boson production at large transverse momentum  
Chen, X. and Cruz-Martinez, J. and Gehrmann, T. and Glover, E. W. N. and Jaquier, M., JHEP **10** (2016) 066.
- Precise QCD predictions for the production of dijet final states in deep inelastic scattering  
Currie, James and Gehrmann, Thomas and Niehues, Jan, Phys. Rev. Lett. **117** (2016) no4 042001.
- CP-even scalar boson production via gluon fusion at the LHC  
Anastasiou, Charalampos and Duhr, Claude and Dulat, Falko and Furlan, Elisabetta and Gehrmann, Thomas and Herzog, Franz and Lazopoulos, Achilleas and Mistlberger, Bernhard, JHEP **09** (2016) 037.
- The NNLO QCD corrections to  $Z$  boson production at large transverse momentum  
Gehrmann-De Ridder, Aude and Gehrmann, T. and Glover, E. W. N. and Huss, A. and Morgan, T. A., JHEP **07** (2016) 133.
- High precision determination of the gluon fusion Higgs boson cross-section at the LHC  
Anastasiou, Charalampos and Duhr, Claude and Dulat, Falko and Furlan, Elisabetta and Gehrmann, Thomas and Herzog, Franz and Lazopoulos, Achilleas and Mistlberger, Bernhard, JHEP **05** (2016) 058.
- Precise QCD predictions for the production of a  $Z$  boson in association with a hadronic jet  
Gehrmann-De Ridder, A. and Gehrmann, T. and Glover, E. W. N. and Huss, A. and Morgan, T. A., Rev. Lett. **117** (2016) no2 022001
- Full top quark mass dependence in Higgs boson pair production at NLO  
Borowka, S. and Greiner, N. and Heinrich, G. and Jones, S. P. and Kerner, M. and Schlenk, J. and Zirke, T., JHEP **10** (2016) 107.
- Higgs Boson Pair Production in Gluon Fusion at Next-to-Leading Order with Full Top-Quark Mass Dependence  
Borowka, S. and Greiner, N. and Heinrich, G. and Jones, S. P. and Kerner, M. and Schlenk, J. and Schubert, U. and Zirke, T., Phys. Rev. Lett. **117** (2016) no1 012001.
- Full mass dependence in Higgs boson production in association with jets at the LHC and FCC  
Greiner, Nicolas and Höche, Stefan and Luisoni, Gionata and Schönherr, Marek and Winter, Jan-Christopher, JHEP **01** (2017) 091.
- Reweighting QCD matrix-element and parton-shower calculations  
Bothmann, Enrico and Schönherr, Marek and Schumann, Steffen, Eur. Phys. J. C **76** (2016) no11 590.
- On the computation of finite bottom-quark mass effects in Higgs boson production  
Mueller, Romain and Öztürk, Deniz Gizem, JHEP **08** (2016) 055.
- Modeling BSM effects on the Higgs transverse-momentum spectrum in an EFT approach  
Grazzini, Massimiliano and Ilnicka, Agnieszka and Spira, Michael and Wiesemann, Marius, JHEP **03** (2017) 115.

- $W^+W^-$  production at the LHC: fiducial cross sections and distributions in NNLO QCD  
Grazzini, Massimiliano and Kallweit, Stefan and Pozzorini, Stefano and Rathlev, Dirk and Wiesemann, Marius, JHEP **08** (2016) 140.
- $W^\pm Z$  production at hadron colliders in NNLO QCD  
Grazzini, Massimiliano and Kallweit, Stefan and Rathlev, Dirk and Wiesemann, Marius, Phys. Lett. B **761** (2016) 179-183.
- Heavy-quark mass effects in Higgs plus jets production  
Frederix, Rikkert and Frixione, Stefano and Vryonidou, Eleni and Wiesemann, Marius, JHEP **08** (2016) 006.
- Differential Higgs Boson Pair Production at Next-to-Next-to-Leading Order in QCD  
de Florian, Daniel and Grazzini, Massimiliano and Hanga, Catalin and Kallweit, Stefan and Lindert, Jonas M. and Maierhöfer, Philipp and Mazzitelli, Javier and Rathlev, Dirk, JHEP **09** (2016) 151.
- Two-loop corrections to the triple Higgs boson production cross section  
de Florian, Daniel and Mazzitelli, Javier, JHEP **02** (2017) 107.
- Double-real corrections at  $\mathcal{O}(\alpha_s^2)$  to single gauge boson production  
Bonciani, Roberto and Buccini, Federico and Mondini, Roberto and Vicini, Alessandro, Eur. Phys. J. C **77** (2017) no2 187.
- Prompt photon production and photon-hadron jet correlations with POWHEG  
Jezo, Tomas and Klasen, Michael and König, Florian, JHEP **11** (2016) 033.
- NLO QCD predictions for off-shell  $t\bar{t}$  and  $t\bar{t}H$  production and decay at a linear collider  
Chokoufè Nejad, Bijan and Kilian, Wolfgang and Lindert, Jonas M. and Pozzorini, Stefano and Reuter, Jürgen and Weiss, Christian, JHEP **12** (2016) 075.
- Four-loop QCD  $\beta$ -function with different fermion representations of the gauge group  
Zoller, M. F., JHEP **10** (2016) 118.
- Next-to-leading order QCD predictions for top-quark pair production with up to three jets  
Höche, Stefan and Maierhöfer, Philipp and Moretti, Niccolo and Pozzorini, Stefano and Siegert, Frank, Eur. Phys. J. C **77** (2017) no3 145.
- An NLO+PS generator for  $t\bar{t}$  and  $Wt$  production and decay including non-resonant and interference effects  
Jezo, Tomas and Lindert, Jonas M. and Nason, Paolo and Oleari, Carlo and Pozzorini, Stefano, Eur. Phys. J. C **76** (2016) no12 691.
- Leading QCD-induced four-loop contributions to the  $\beta$ -function of the Higgs self-coupling in the SM and vacuum stability  
Chetyrkin, K. G. and Zoller, M. F., JHEP **06** (2016) 165.
- On the renormalization of operator products: the scalar gluonic case  
Zoller, Max F., JHEP **04** (2016) 165.
- NLO QCD+EW predictions for  $V + \text{jets}$  including off-shell vector-boson decays and multijet merging  
Kallweit, Stefan and Lindert, Jonas M. and Maierhöfer, Philipp and Pozzorini, Stefano and Schönherr, Marek, JHEP **04** (2016) 021.
- Fully differential NLO predictions for the rare muon decay  
Pruna, G. M. and Signer, A. and Ulrich, Y., Phys. Lett. B **765** (2017) 280-284.
- Regularization-scheme dependence of QCD amplitudes in the massive case  
Gnendiger, Christoph and Signer, Adrian and Visconti, Andrea, JHEP **10** (2016) 034.
- $(g - 2)_\mu$ , lepton flavor violation, and  $Z$  decays with leptoquarks: Correlations and future prospects  
Coluccio Leskow, Estefania and D'Ambrosio, Giancarlo and Crivellin, Andreas and Müller, Dario, Phys. Rev. D **95** (2017) no5 055018.

- Lepton Flavor Non-Universality in B decays from Dynamical Yukawas  
Crivellin, Andreas and Fuentes-Martin, Javier and Greljo, Admir and Isidori, Gino, Phys. Lett. B **766** (2017) 77-85.
- Likelihood Analysis of Supersymmetric SU(5) GUTs  
Bagnaschi, E. *et al.*, Eur. Phys. J. C **77** (2017) no2 104.
- Measuring the breaking of lepton flavor universality in  $B \rightarrow K^* \ell^+ \ell^-$   
Serra, Nicola and Silva Coutinho, Rafael and van Dyk, Danny, Phys. Rev. D **95** (2017) no 3 035029.
- Confronting lepton flavor universality violation in B decays with high- $p_T$  tau lepton searches at LHC  
Faroughy, Darius A. and Greljo, Admir and Kamenik, Jernej F., Phys. Lett. **B764** (2017) 126-134.
- Anomalous Triple Gauge Couplings in the Effective Field Theory Approach at the LHC  
Falkowski, Adam and Gonzalez-Alonso, Martin and Greljo, Admir and Marzocca, David and Son, Minh, JHEP **02** (2017) 115.
- QCD Factorization Theorem for  $B \rightarrow \pi\pi\ell\nu$  Decays at Large Dipion Masses  
Böer, Philipp and Feldmann, Thorsten and van Dyk, Danny, JHEP **02** (2017) 133.
- Massive vectors and loop observables: the  $g - 2$  case  
Biggio, Carla and Bordone, Marzia and Di Luzio, Luca and Ridolfi, Giovanni, JHEP **10** (2016) 002.
- On the Standard Model predictions for  $R_K$  and  $R_{K^*}$   
Bordone, Marzia and Isidori, Gino and Pattori, Andrea, Eur. Phys. J. **C76** (2016) no8, 440.
- Toward a coherent solution of diphoton and flavor anomalies  
Buttazzo, Dario and Greljo, Admir and Isidori, Gino and Marzocca, David, JHEP **08** (2016) 035.

#### Articles in press

- Semi-leptonic  $B$ -physics anomalies: a general EFT analysis within  $U(2)^n$  flavor symmetry  
Bordone, Marzia and Isidori, Gino and Trifinopoulos, Sokratis, arXiv:1702.07238.
- Likelihood Analysis of the Minimal AMSB Model  
Bagnaschi, E. *et al.*, arXiv:1612.05210.

#### Oral Presentations

- M. Bordone: On precise predictions for LFU ratios in B physics  
Implications of LHCb measurements and future prospects, CERN, 12.10.2016.
- M. Bordone: On the theory prediction of  $R_K$  and  $R_K^*$   
9th International Workshop on the CKM Unitarity Triangle, Mumbai, 29.11.2016.
- S. Borowka: Higgs Pair Production in gluon fusion at NLO with full top mass dependence  
Seminario de fisica teorica, UNAL Bogota, Colombia, 03.08.2016.
- S. Borowka: Higgs Pair Production in gluon fusion at NLO with full top mass dependence  
28th Rencontres de Blois, Blois, France, 01.06.2016.
- S. Borowka: Numerical evaluation of multi-loop integrals and Higgs boson pair production  
Dirk Kreimer research seminar, HU Berlin, Berlin, Germany, 04.07.2016.
- D. Buttazzo: Singlet-like Higgs production  
FCC workshop, CERN, 18.1.2017.
- D. Buttazzo: Towards a coherent picture of flavour and diphoton anomalies  
Heavy Flavour workshop, Islay, 28.4.2016.
- D. Buttazzo: Higgs mass and unified gauge coupling in the NMSSM with vector-like matter  
GGI Firenze, 19.5.2016.

- D. Buttazzo: Search for two-body resonances  
pp@LHC workshop, Pisa, 16.5.2016.
- D. Buttazzo: Toward a coherent picture of diphoton and flavour anomalies  
LNF Frascati, 28.4.2016.
- L. Cieri: Resummation, Universality and the Hard-Functions  
Calcoli analitici e Fisica di precisione. Università degli Studi e INFN Milano, Italy, 15.2.2017.
- L. Cieri: Diphoton production at the LHC  
HP2.6. ICAS-UNSAM, Buenos Aires, Argentina, 9.9.2016.
- L. Cieri: Diphoton production at the LHC  
New Frontiers in Theoretical Physics - XXXV Convegno Nazionale di Fisica Teorica and GGI 10th anniversary,  
Galileo Galilei Institute, Florence, Italy, 19.5.2016.
- T. Gehrmann: Advances in QCD Predictions  
opening talk, 24th International Workshop on Deep Inelastic Scattering and Related Topics (DIS 2016), DESY, Ham-  
burg, Germany, 11.4.2016.
- T. Gehrmann: Transverse Momentum Distributions and Jet Cross Sections  
Workshop on Effective Field Theories for Collider Physics, Eltville, Germany, 14.9.2016.
- T. Gehrmann: Transverse Momentum Distributions and Jet Cross Sections  
Workshop on Future Challenges for Precision QCD, Durham, 26.10.2016.
- 88 - T. Gehrmann: Higgs Production Through Gluon Fusion  
Workshop HiggsCouplings, SLAC, Stanford, USA, 9.11.2016.
- T. Gehrmann: Standard Model Theory for the LHC  
12th Vienna Central European Seminar: Physics at LHC Run 2, Vienna, Austria, 1.12.2016.
- T. Gehrmann: Precision Physics with Jet Observables  
Theory Seminar, Tübingen University, Germany, 16.3.2017.
- M. Grazzini: Vector boson pair production at NNLO  
2nd Higgstools Meeting, Granada, Spain, 14.4.2016.
- M. Grazzini: SM Higgs signal and background cross sections for the LHC Run 2  
ATLAS H $\rightarrow$ ZZ Meeting, Munich, Germany, 29.4.2016.
- M. Grazzini: Standard Model Higgs Physics  
WE Heraeus Seminar, Bad Honnef, Germany, 17.10.2016.
- M. Grazzini: Vector boson pair production at NNLO  
Seminar at Annecy, France, 26.01.2017.
- N. Greiner: Higgs plus jets in gluon fusion at the LHC  
Seminar at the Florida State University, Tallahassee, Florida, 6.5.2016.
- N. Greiner: NLO/MC tools  
Pheno 2016, University of Pittsburgh, USA 9.-11.5.2016.
- N. Greiner: SM/BSM physics with GoSam  
Monte Carlo Tools for Physics Beyond the Standard Model Beijing, China, 20.7-24.7.2016.
- A. Greljo: Anomalous Higgs and Triple Gauge Couplings in the Effective Field Theory Approach  
ICHEP 2016, Chicago, USA, 05.08.2016.
- A. Greljo: Implications of new physics in B decays for high- $p_T$  searches at LHC  
Mainz Institute for Theoretical Physics, Germany, 06.09.2016.

- A. Greljo: Implications of Lepton Flavor Non-Universality in B decays  
CERN BSM forum, CERN, 08.12.2016.
- A. Greljo: Flavour Anomalies vs. High- $p_T$  Physics  
La Thuile 2017, Italy, 10.03.2017.
- A. Greljo: Hints in semi-tauonic B meson decays: The physics case for high- $p_T$  LHC  
Mini-workshop on  $D^* \rightarrow \tau\nu$  and related topics, Nagoya University, Japan, 28.03.2017.
- A. Ilnicka: Effective Field Theory in quest to parametrise Higgs properties: the transverse momentum spectrum case  
Discrete 2016, Uni. Warsaw, Poland 30.11.2016.
- A. Ilnicka: Effective Field Theory for Higgs properties parametrisation: the transverse momentum spectrum case  
Recontres de Moriond QCD, La Thuile, Italy, 26.03.2017.
- A. Ilnicka: Modeling BSM effects on the Higgs  $p_T$  spectrum in a EFT approach  
PhD seminar, Zürich, Switzerland, 25.11.2016.
- G. Isidori: Flavor Physics beyond the Standard Model  
Latin-American Conference on High-Energy Physics, Havana, Cuba, 19.07.2016.
- G. Isidori: Kaon Physics: the Next Step  
Kaon 2016 Conference, Birmingham, UK, 17.09.2016.
- G. Isidori: Flavor Physics beyond the Standard Model  
AJB 70 Symposium, TU Munich, Germany, 28.10.2016.
- G. Isidori: Higgs Pseudo Observables  
Workshop Higgs Couplings, SLAC, Stanford, USA, 10.11.2016.
- T. Ježo: Theory talk I: SM modeling  
3rd CMS Single-Top Workshop, IPHC, Strasbourg, France, 2.6.2016.
- T. Ježo: An NLO+PS generator for top pair production and decay including non-resonant and interference effects  
Large Hadron Collider Physics (LHCP 2016), Lund University, Sweden, 14.6.2016.
- T. Ježo: nCTEQ15 nuclear parton distributions with uncertainties  
Large Hadron Collider Physics (LHCP 2016), Lund University, Sweden, 14.6.2016.
- T. Ježo: Latest Developments in POWHEG  
LHC top working group meeting, CERN, Geneva, Switzerland, 21.11.2016.
- A. Karlberg: VBF Higgs production in the structure function approach and beyond  
Future challenges for precision QCD, University of Durham, United Kingdom, 25.10.2016.
- A. Karlberg: VBF Higgs production at NNLO ... and beyond  
Tübingen Particle Theory Seminar, University of Tübingen, Germany, 17.11.2016.
- J. Lindert: Resonance aware NLO+PS in POWHEG for top-pair and single-top physics  
QCD@LHC, Zurich, Switzerland, 23.08.2016.
- J. Lindert: Differential Higgs Boson Pair Production at Next-to-Next-to-Leading Order in QCD  
QCD@LHC, Zurich, Switzerland, 25.08.2016.
- J. Lindert: NLO+PS predictions for top-pair and  $Wt$  production and decay  
High Precision for Hard Processes (HP2), Buenos Aires, Argentina, 08.09.2016.
- J. Lindert: NLO QCD+EW for Dark Matter Backgrounds  
LHC Dark Matter WG, CERN, 20.09.2016.
- J. Lindert: EWK corrections to non-VBF processes  
Future of VBF measurements, Durham, UK, 21.09.2016.

- J. Lindert: Pseudo Observables in EW Higgs production  
Future of VBF measurements, Durham, UK, 22.09.2016.
- J. Lindert: Differential Higgs Boson Pair Production at Next-to-Next-to-Leading Order in QCD  
DESY Theory workshop, DESY, Hamburg, Germany, 28.09.2016.
- J. Lindert: NLO+PS predictions for top-pair and  $Wt$  production and decay  
DESY Theory workshop, DESY, Hamburg, Germany, 29.09.2016.
- N. A. Lo Presti: Two-loop five-point integrals in massless QCD  
Loops and Legs Conference, Leipzig, Germany, 24.-29.4.2016.
- D. Marzocca: Template cross sections and pseudo-observable for Higgs physics  
SM@LHC, Pittsburgh, USA, 3-6.05.2016.
- D. Marzocca: A composite model for flavor and diphoton anomalies  
Holography, conformal field theories, and lattice, Edinburgh, UK, 27-30.06.2016.
- D. Marzocca: Violation of Lepton Flavor Universality in B decays  
BSM faces LHC Run-2 realities workshop, DESY, Germany, 12.09.2016.
- D. Marzocca: EFT constraints from precision measurements and prospects  
Rencontres du Vietnam, Quy Nhon, Vietnam, 28.09.2016.
- D. Marzocca: Pseudo-observables in Higgs physics  
HEFT, Copenhagen, Denmark, 28.10.2016.
- 90 - J. Mazzitelli: Double-Higgs production  
Sinergia Meeting, Zurich, Switzerland, 21.12.2016.
- A. Pattori: On the Standard Model predictions for  $R_K$  and  $R_K^*$   
BEACH2016 workshop, George Mason University, USA, 16.06.2016.
- A. Pattori: Lepton Flavor Violation in Composite Higgs Models  
CLFV2016, Charlottesville, VA, USA, 20.06.2016.
- A. Pattori: About the explanation of  $R_D$  through left-handed currents  
seminar at LAPTh, Annecy, France, 01.12.2016.
- S. Pozzorini: Precision for V+jets and Dibosons  
KITP Workshop LHC Run II and the Precision Frontier, University of California Santa Barbara, USA, 23.4.2016.
- S. Pozzorini: Theory tools for precision SM and Higgs Physics  
Strategy Workshop on High-Energy Particle Physics in Switzerland, Aegerisee, Switzerland, 7.6.2016.
- S. Pozzorini: Electroweak Theory and Higgs Mechanism  
Lecture at 2016 CTEQ & MCnet School, DESY Hamburg, Germany, 6.7.2016.
- S. Pozzorini: Theory precision for ttH signals and backgrounds  
QCD@LHC 2016, Zurich, Switzerland, 22.8.2016.
- S. Pozzorini: Electroweak corrections and off-shell effects in tt production and decay  
9th International Workshop on Top Quark Physics (TOP 2016), Olomouc, Czech Republic, 19.9.2016.
- S. Pozzorini: Theory simulations for multi-particle processes and applications to Top Physics  
Seminar at CP3-Origins, Odense, 23.1.2017.
- S. Pozzorini: NLO+PS Simulations for Top Physics with OpenLoops  
Seminar at Freiburg University, Germany, 18.1.2107.
- H. Sargsyan: Transverse-momentum resummation for top-quark pair production at hadron colliders  
QCD@LHC, Zürich, Switzerland, 23.08.2016.

- H. Sargsyan: Transverse-momentum resummation for top-quark pair production at hadron colliders HP2.6, Buenos Aires, Argentina, 08.09.2016.
- H. Sargsyan: Transverse-momentum resummation for top-quark pair production at hadron colliders Seminar at Freiburg University, Freiburg, Germany, 18.10.2016.
- H. Sargsyan: Transverse-momentum resummation for top-quark pair production at hadron colliders PhD seminar, Zürich, Switzerland, 25.11.2016.
- H. Sargsyan: Transverse-momentum resummation for top-quark pair production at hadron colliders SMP-J workshop, CERN, Geneva, Switzerland, 23.08.2016.
- M. Schönherr: Electroweak corrections for the LHC Seminar at Milano-Bicocca University, Milano, Italy, 14.04.2016.
- M. Schönherr: Electroweak corrections for the LHC Seminar at Göttingen University, Göttingen, Germany, 03.06.2016.
- M. Schönherr: Status of electroweak corrections in Sherpa+OpenLoops MW-Meeting, CERN, 08.06.2016.
- M. Schönherr: NLO electroweak corrections in V+jets LHCP 2016, Lund, Sweden, 16.06.2016.
- M. Schönherr: Reweighting QCD matrix element and parton shower calculations Parton showers and resummation, Paris, France, 04.07.2016.
- M. Schönherr: Monte Carlo event generation: Introduction I, II, III & Tutorial 4th African School of Fundamental Physics and its Applications, Kigali, Rwanda, 03.-04.08.2016.
- M. Schönherr: Electroweak corrections to V+jets production LoopFest XV, Buffalo, USA, 16.08.2016.
- M. Schönherr: Sherpa: overview and recent developments QCD@LHC, Zürich, Switzerland, 23.08.2016.
- M. Schönherr: Sherpa-2.2.1: overview, developments and usage CMS Sherpa Tutorial, CERN, 29.08.2016.
- M. Schönherr: Electroweak corrections for LHC physics Seminar at Michigan State University, East Lansing, USA, 01.11.2016.
- M. Schönherr: Monte-Carlo simulation and uncertainties Higgs Couplings, SLAC, Stanford, USA, 09.11.2016.
- M. Schönherr: Sherpa: scaling on HPCs ATLAS Software & Computing Week, CERN, 16.03.2017.
- M. Wiesemann: MATRIX: A fully-differential NNLO(+NNLL) process library Loops&Legs 2016, Leipzig, Germany, 28.04.2016.
- M. Wiesemann: Transverse-momentum resummation of colorless final states at the NNLL+NNLO 28th Rencontres de Blois, Blois, France, 01.06.2016.
- M. Wiesemann: Theory/MC status of Higgs production in association with bottom quarks CMS Higgs PAG - H2tau subgroup meeting, CERN, Switzerland, 06.07.2016.
- M. Wiesemann: bbH: status and future plans Preparatory Meeting of the LHC Higgs Cross Section Working Group, CERN, Switzerland, 08.07.2016.
- M. Wiesemann: MATRIX: A fully-differential NNLO(+NNLL) process library LoopFest XV, Buffalo, USA, 16.08.2016.

- M. Wiesemann: MATRIX: A fully-differential NNLO(+NNLL) process library QCD@LHC 2016, Zürich, Switzerland, 25.08.2016.
- M. Wiesemann: MATRIX: A fully-differential NNLO(+NNLL) process library High Precision for Hard Processes 6, Buenos Aires, Argentina, 09.09.2016.
- M. Wiesemann: bbH: report and future plans 12th Workshop of the LHC Higgs Cross Section Working Group, CERN, Switzerland, 13.10.2016.
- M. Wiesemann: Higher-order corrections to differential WW production LHC EWK WG multiboson discussion, CERN, Switzerland, 13.02.2017.
- M. Wiesemann: MATRIX: A fully-differential NNLO(+NNLL) process library CMS Generator Meeting, CERN, Switzerland, 06.03.2017.
- M. Wiesemann: Vector-boson pair production at NNLO(+NNLL) LHCTheory ERC meeting, Louvain-La-Neuve, Belgium, 23.03.2017.
- D. van Dyk: Exclusive  $b \rightarrow c\ell\bar{\nu}$  decays: SM predictions and uncertainties Prospects and challenges for semitaquonic decays at LHCb, CERN, 28.04.2016.
- D. van Dyk:  $B \rightarrow \pi\pi\ell\nu$  – Accessing theory estimates in various phase space corners MIAPP Workshop Flavour Physics with High-Luminosity Experiments München, Germany, 04.11.2016.
- D. van Dyk: QCD sum rules predictions for exclusive  $b \rightarrow c$  transitions 9th International Workshop on the CKM Unitarity Triangle (CKM2016), Mumbai, India, 29.11.2016.
- D. van Dyk: Semileptonic  $b$  decays: Preparing theory predictions for the era of high-luminosity experiments DPG Spring Conference, Münster, Germany, 30.03.2017.
- M.F. Zoller: Four-loop beta functions in the Standard Model: Leading contributions and their impact on vacuum stability Particle physics seminar, DESY Zeuthen, Germany, 09.06.2016.
- M.F. Zoller: Vacuum stability in the Standard Model: Towards a four-loop precision analysis HP2.6, Buenos Aires, Argentina, 06.09.2016.
- M.F. Zoller: Four-loop renormalization group functions in the Standard Model and beyond Workshop: Precision versus Energy, Present and Future Colliders KIT, Germany, 10.11.2016.

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## 20.1.2 Astrophysics and General Relativity

### Articles

- Gravitational wave polarization modes in  $f(R)$  theories R. Kausar, L. Philippoz and Ph. Jetzer, Phys. Rev. D **93**, (2016) 124071.
- Sub-femto-g free-fall for space-based gravitational wave observatories: LISA Pathfinder results M. Armano *et al.*, (The LISA Pathfinder collaboration), Phys. Rev. Lett. **116**, (2016) 231101.
- The Triangulum galaxy seen by Planck F. De Paolis, V.G. Gurzadyan, A.A. Nucita, L. Chemin, A. Qadir, A.L. Kashin, H.G. Khachatryan, S. Sargsyan, G. Yegorian, G. Ingrosso, Ph. Jetzer, D. Vetrugno, Astron. and Astrophys. **593**, (2016) A57.
- Constraints on LISA Pathfinder's self-gravity: design requirements, estimates and testing procedures M. Armano *et al.*, (The LISA Pathfinder collaboration) Class. Quantum Grav. **33**, 235015 (2016).
- LISA Pathfinder: first results Ph. Jetzer, SPG Mitteilungen, **50**, (2016) 60-62.
- Self-gravitating stellar collapse: explicit geodesics and path integration J. Balakrishna, R. Bondarescu and C. Corbett Moran, Front. Astron. Space Sci. **3** (2016) 29.



- Quantifying substructures in Hubble Frontier Field clusters: comparison with  $\Lambda$ CDM simulations  
I. Mohammed, P. Saha, L. L. R. Williams, J. Liesenborgs, Jori, K. Sebesta, Monthly Notices of the Royal Astronomical Society, **459** (2016) 1698–1709.
- Strong gravitational lensing and the stellar IMF of early-type galaxies  
D. Leier, I. Ferreras, P. Saha, S. Charlot, G. Bruzual, F. La Barbera, Monthly Notices of the Royal Astronomical Society, **459**, (2016) 3677–3692.
- Testing light-traces-mass in Hubble Frontier Fields Cluster MACS-J0416.1-2403  
K. Sebesta, L. L. R. Williams, I. Mohammed, P. Saha, J. Liesenborgs, Monthly Notices of the Royal Astronomical Society, **461**, (2016) 2126–2134.

#### Oral Presentations

- Philippe Jetzer: Fundamental physics with space clocks in highly elliptic orbits  
General Relativity GR21 Meeting, New York, 12 July 2016.
- Rafael Küng: Lensing galaxies in the CFHT legacy survey  
Swiss Cosmology Days, Basel, 7 February 2017.
- Maria Haney: Joint update on eccentric waveform development in the CBC group  
March 2017 LSC-Virgo Collaboration Meeting, Pasadena, 13 March 2017.
- Andreas Schärer: PPN Parameters in Scalar-Tensor Theories  
Seminar at Institute of Physics Tartu, Estonia, 21 March 2017.
- Lionel Philippoz: Detecting Additional Polarization Modes with LISA  
Rencontres de Moriond, La Thuile, 28 March 2017.
- Yannick Bötzel: On solving post-Newtonian accurate Kepler Equation  
Rencontres de Moriond, La Thuile, 30 March 2017.

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#### Outreach

- Lionel Philippoz: Ondes gravitationnelles : Le retour d'Einstein  
Société Valaisanne de Physique, Sion, 23 September 2016.
- Philippe Jetzer: Gravitationswellen: Ein neues Fenster zur Erforschung des Universums (von LISA Pathfinder zu LISA)  
Emeritenstamm ETH, Winterthur, 26 September 2016.
- Philippe Jetzer: Onde Gravitazionali  
TechDay, Liceo di Bellinzona, 11 November 2016.
- Philippe Jetzer: Gravitationswellen: Ein neues Fenster zur Erforschung des Universums  
Physikalische Gesellschaft Zürich, Zürich, 26 November 2016.

### 20.1.3 GERDA

#### Articles

- Background-free Search for Neutrinoless Double Beta Decay with GERDA Phase II  
M. Agostini *et al.* (GERDA Collaboration), NATURE Vol. **544** No. 7648, pp.47-52 (2017).
- Limits on uranium and thorium bulk content in GERDA Phase I detectors  
M. Agostini *et al.* (GERDA Collaboration), Astropart.Phys. **91** (2017) 15-21.
- Limit on the Radiative Neutrinoless Double Electron Capture of  $^{36}\text{Ar}$  from GERDA Phase I  
M. Agostini *et al.* (GERDA Collaboration), Europ. Phys. J. C, **76**(12), 1-6 (2016).

- Flux Modulations seen by the Muon Veto of the GERDA Experiment  
M. Agostini *et al.* (GERDA Collaboration), *Astropart. Phys.* **84** (2016) 29-35.

#### Oral Presentations

- R. Hiller: Prospects for keV-DM searches with the GERDA experiment  
DPG meeting, Munster, Germany, March 29, 2017.
- R. Mingazheva: Current status and plans of the Gerda experiment  
SPS Meeting, Lugano, August 26, 2016.
- R. Mingazheva: Search for neutrinoless double beta decay with the Gerda experiment  
From the Vacuum to the Universe, Kitzbuhel, Austria, June 28, 2016.

### 20.1.4 XENON/DARWIN

#### Articles

- Search for Electronic Recoil Event Rate Modulation with 4 Years of XENON100 Data  
E. Aprile *et al.* (XENON Collaboration), *Phys. Rev. Lett.* **118** (2017) no.10, 101101.
- Search for Two-Neutrino Double Electron Capture of  $^{124}\text{Xe}$  with XENON100  
E. Aprile *et al.* (XENON Collaboration), *Phys. Rev. C* **95** (2017) no.2, 024605.
- Results from a Calibration of XENON100 Using a Source of Dissolved Radon-220  
E. Aprile *et al.* (XENON Collaboration), *Phys. Rev. D* **95** (2016) 072008.
- XENON100 Dark Matter Results from a Combination of 477 Live Days  
E. Aprile *et al.* (XENON Collaboration), *Phys. Rev. D* **94** (2016) no.12, 122001.
- Qualification Tests of the R11410-21 Photomultiplier Tubes for the XENON1T Detector  
P. Barrow, L. Baudis, D. Cichon, M. Danisch, D. Franco, F. Kaether, A. Kish, M. Lindner, T. Marrodan Undagoitia, D. Mayani, L. Rauch, Y. Wei, J. Wulf, *JINST* **12** (2017) no.01, P01024
- DARWIN: towards the ultimate dark matter detector  
E. Aalbers *et al.* (DARWIN Collaboration), *JCAP* **1611** (2016) no.11, 017.
- A low-mass dark matter search using ionization signals in XENON100  
E. Aprile *et al.* (XENON Collaboration), *Phys. Rev. D* **94** (2016) no.9, 092001.

#### Oral Presentations

- L. Baudis: Illuminating the dark side: direct searches for cold dark matter in the Milky Way  
Physics Colloquium, University of Geneva, Geneva, March 20, 2017.
- L. Baudis: Prospects for direct dark matter detection and neutrinoless double beta decay experiments  
La Thuile 2017, La Thuile, Italy, March 7, 2017.
- L. Baudis: Illuminating the dark side: direct searches for cold dark matter with XENON and DARWIN  
Physics Seminar, Physics Department, Stanford, Palo Alto, USA, February 21, 2017.
- L. Baudis: Illuminating the dark side: direct searches for cold dark matter with XENON and DARWIN  
Physics Seminar, Physics Department, UCLA, USA, February 15, 2017.
- L. Baudis: Dark matter detection in the Milky Way  
Physics Colloquium, KIT, Karlsruhe, January 27, 2017.
- L. Baudis: Dark matter detection - an overview  
Zurich Phenomenology Workshop (ZPW) 2017, Zurich, January 10, 2017.

- L. Baudis: Dark matter detection in the Milky Way  
Physics Colloquium, PSI, November 17, 2016.
- Y. Wei: Photodetectors for the XENON1T Dark Matter Experimentt  
2016 IEEE NSS/MIC, Strasbourg, France, October 30 2016.
- L. Baudis: Illuminating the dark side: the XENON experiment and the nature of dark matter  
Seminar, Physics Department, Milano Bicocca University, Milano, October 11, 2016.
- A. Kish: DARWIN: Towards the Ultimate Dark Matter Detector  
TeV Particle Astrophysics (TeVPA-2016), CERN, Switzerland, September 16, 2016.
- L. Baudis: The state-of-the art in the search for dark matter  
SPS Meeting, Lugano, August 25, 2016.
- Y. Wei: The XENON1T Dark Matter Experiment  
SPS Meeting, Lugano, August 25, 2016.
- J. Wulf: Characterization of VUV Silicon-Photomultipliers for xenon based dark matter detectors  
SPS Meeting, Lugano, August 24, 2016.
- M. Galloway: Design and characterisation of the Xurich II dual-phase xenon time projection chamber  
SPS Meeting, Lugano, August 24, 2016.
- M. Galloway: Dark Matter Search at the Multi-Ton Scale with XENONnT  
Identification of Dark Matter, Sheffield, England, July 20, 2016.
- J. Wulf: Direct Dark Matter Detection with XENON1T  
Direct Dark Matter Detection with XENON1T, Quy Nhon, Vietnam, July 13, 2016.
- L. Baudis: Illuminating the dark side: liquid xenon and the nature of dark matter  
Julius Wess Award Ceremony KCETA, Karlsruhe, July 8, 2016.
- M. Galloway: Direct Dark Matter Detection with XENON1T  
From the Vacuum to the Universe, Kitzbuhel, Austria, June 28, 2016.
- L. Baudis: Noble liquid dark matter experiments  
Dark Matter 2016: from the smallest to the largest scales Santander, June 29, 2016.
- A. Kish: XENON: Dual-phase TPCs for Dark Matter Detection  
Excellence Cluster Universe 'Detectors and Instrumentation' Workshop, MPE Munich, Germany, 31 May 2016.

#### Outreach

- L. Baudis: Exploring the vast dark universe  
TEDxCERN talk, CERN, Geneva, November 5, 2016.
- L. Baudis: Supersymmetrie und das Universum  
Volkshochschule Zurich, Zurich, September 19, 2016.
- L. Baudis: Dark matter  
zurich.minds Deep Dive, Zurich Uniturm, Zurich, April 6, 2016.

#### 20.1.5 DAMIC and CONNIE

##### Articles

- First Direct-Detection Constraints on eV-Scale Hidden-Photon Dark Matter with DAMIC at SNOLAB  
DAMIC Collaboration, A. Aguilar-Aravelo *et al.*, Phys. Rev. Lett. **118**, 141803 (2017).

- Search for low-mass WIMPs in a 0.6 kg day exposure of the DAMIC experiment at SNOLAB  
DAMIC Collaboration, A. Aguilar-Aravelo *et al.*, Phys. Rev. D **94**, no. 8, 082006 (2016).
- Status of the DAMIC Direct Dark Matter Search Experiment  
DAMIC Collaboration, A. Aguilar-Aravelo *et al.*, arXiv:1510.00044 [physics.ins-det].
- The CONNIE experiment  
CONNIE Collaboration, A. Aguilar-Aravelo *et al.*, J. Phys. Conf. Ser. **761**, no. 1, 012057 (2016).
- Results of the engineering run of the Coherent Neutrino Nucleus Interaction Experiment (CONNIE)  
CONNIE Collaboration, A. Aguilar-Aravelo *et al.*, JINST **11**, no. 07, P07024 (2016).

#### Oral presentations

- B. Kilminster: Coherent neutrino nucleus interaction experiment in CCDs  
Applied Antineutrino physics 2016, Dec. 2016, Liverpool, U.K.
- J. Liao: The status of the DAMIC experiment at Snolab  
Identification of Dark Matter 2016, July 18 - 22 2016, Sheffield, U.K.

#### 20.1.6 SHiP

##### Oral presentations

- Elena Graverini: SHiP: a new facility with dedicated detectors to search for new long-lived neutral particles and study the  $\tau$  neutrino properties  
Seminar, Université Libre de Bruxelles, Bruxelles, Belgium, February 26, 2016.
- Elena Graverini: SHiP: a new facility with a dedicated detector to search for new long-lived neutral particles and study the  $\tau$  neutrino properties  
8th Rencontres de Blois on Particle Physics and Cosmology, Blois (FR), May 29 – June 3, 2016.
- Elena Graverini: Heavy neutrino searches from MeV to TeV  
International Workshop on Neutrino Factories, Super Beams and Beta Beams, Quy Nhon, Vietnam, August 21 – 27, 2016.
- Christopher Betancourt: The SHiP Experiment at CERN  
Strasbourg, France, November 3, 2016.
- Christopher Betancourt: SiPM readout for the SHiP timing detector  
14th Topical Seminar on Innovative Particle and Radiation Detectors (2016), Siena, Italy, October 3, 2016, proceedings published in JINST **12** no. 02, C02058 (2017).
- Christopher Betancourt: Development of the SHiP Timing Detector Based on Scintillating Bars Readout by SiPMs, 12th Trento Workshop on Advanced Silicon Radiation Detectors, Trento, Italy, February 22, 2017.

#### 20.1.7 H1

The 2015 H1 Collaboration has 141 members including K. Müller, P. Robmann, U. Straumann and P. Truöl.  
Articles

- Measurement of Jet Production Cross Sections in Deep-inelastic ep Scattering at HERA  
H1 Collaboration, V. Andreev *et al.*, Eur. Phys. J. C **77** (2017) no.4, 215.
- Search for QCD Instanton-Induced Processes at HERA in the High- $Q^2$  Domain  
H1 Collaboration, V. Andreev *et al.*, Eur. Phys. J. C **76** (2016) 7, 1.

## 20.1.8 CMS

### Articles

- The Triple GEM Detector Control System for CMS forward muon spectrometer upgrade  
CMS Muon Collaboration, W. Ahmed *et al.*, JINST **12**, no. 02, P02003 (2017).
- Search for dark matter and unparticles in events with a Z boson and missing transverse momentum in proton-proton collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Sirunjan *et al.*, JHEP **1703**, 061 (2017).
- Search for massive resonances decaying into WW, WZ or ZZ bosons in proton-proton collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Sirunjan *et al.*, JHEP **1703**, 162 (2017).
- Search for electroweak production of a vector-like quark decaying to a top quark and a Higgs boson using boosted topologies in fully hadronic final states  
CMS Collaboration, A. M. Sirunjan *et al.*, JHEP **1704**, 136 (2017).
- Search for heavy neutrinos or third-generation leptoquarks in final states with two hadronically decaying  $\tau$  leptons and two jets in proton-proton collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1703**, 077 (2017).
- Search for CP violation in  $t\bar{t}$  production and decay in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1703**, 101 (2017).
- Search for supersymmetry in events with photons and missing transverse energy in pp collisions at 13 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **769**, 391 (2017).
- Search for heavy resonances decaying to tau lepton pairs in proton-proton collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1702**, 048 (2017).
- Measurement of the  $t\bar{t}$  production cross section using events in the  $e\mu$  final state in pp collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **77**, 172 (2017).
- Measurements of differential production cross sections for a Z boson in association with jets in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1704**, 022 (2017).
- Charged-particle nuclear modification factors in PbPb and pPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1704**, 039 (2017).
- Relative modification of prompt  $\psi(2S)$  and J/ $\psi$  yields from pp to PbPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV  
CMS Collaboration, A. M. Sirunjan *et al.*, Phys. Rev. Lett. **118**, 162301 (2017).
- Searches for invisible decays of the Higgs boson in pp collisions at  $\sqrt{s} = 7, 8,$  and 13 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1702**, 135 (2017).
- Search for heavy resonances decaying into a vector boson and a Higgs boson in final states with charged leptons, neutrinos, and b quarks  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **768**, 137 (2017).
- Search for R-parity violating supersymmetry with displaced vertices in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. D **95**, 012009 (2017).
- Search for electroweak production of charginos in final states with two leptons in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1704**, 018 (2017).
- Search for top quark decays via Higgs-boson-mediated flavor-changing neutral currents in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1702**, 079 (2017).

- Measurements of differential cross sections for associated production of a W boson and jets in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. D **95**, 052002 (2017).
- Search for anomalous Wtb couplings and flavour-changing neutral currents in t-channel single top quark production in pp collisions at  $\sqrt{s} = 7$  and 8 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1702**, 028 (2017).
- Search for high-mass  $Z\gamma$  resonances in  $e^+e^-\gamma$  and  $\mu^+\mu^-\gamma$  final states in proton-proton collisions at  $\sqrt{s} = 8$  and 13 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1701**, 076 (2017).
- Suppression and azimuthal anisotropy of prompt and nonprompt  $J/\psi$  production in PbPb collisions at  $\sqrt{s_{NN}} = 2.76$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **77**, no. 4, 252 (2017).
- Observation of charge-dependent azimuthal correlations in pPb collisions and its implication for the search for the chiral magnetic effect  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. Lett. **118**, 122301 (2017).
- Search for supersymmetry in events with one lepton and multiple jets in proton-proton collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. D **95**, no. 1, 012011 (2017).
- Inclusive search for supersymmetry using razor variables in pp collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. D **95**, no. 1, 012003 (2017).
- Measurement of the WZ production cross section in pp collisions at  $\sqrt{s} = 7$  and 8 TeV and search for anomalous triple gauge couplings at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **77**, no. 4, 236 (2017).
- Search for narrow resonances in dilepton mass spectra in proton-proton collisions at  $\sqrt{s} = 13$  TeV and combination with 8 TeV data  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **768**, 57 (2017).
- Measurement and QCD analysis of double-differential inclusive jet cross sections in pp collisions at  $\sqrt{s} = 8$  TeV and cross section ratios to 2.76 and 7 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1703**, 156 (2017).
- Search for high-mass diphoton resonances in proton-proton collisions at 13 TeV and combination with 8 TeV search  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **767**, 147 (2017).
- The CMS trigger system  
CMS Collaboration, A. M. Khachatryan *et al.*, JINST **12**, no. 01, P01020 (2017).
- Measurement of the production cross section of a W boson in association with two b jets in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **77**, no. 2, 92 (2017).
- Measurement of the WZ production cross section in pp collisions at  $\sqrt{s} = 13$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **766**, 268 (2017).
- Jet energy scale and resolution in the CMS experiment in pp collisions at 8 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JINST **12**, no. 02, P02014 (2017).
- Observation of the decay  $B^+ \rightarrow \psi(2S)\phi(1020)K^+$  in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **764**, 66 (2017).
- Evidence for collectivity in pp collisions at the LHC  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **765**, 193 (2017).
- Measurement of the transverse momentum spectra of weak vector bosons produced in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1702**, 096 (2017).

- Measurement of the transverse momentum spectrum of the Higgs boson produced in pp collisions at  $\sqrt{s} = 8$  TeV using  $H \rightarrow WW$  decays  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1703**, 032 (2017).
- Search for Dark Matter and Supersymmetry with a Compressed Mass Spectrum in the Vector Boson Fusion Topology in Proton-Proton Collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. Lett. **118**, no. 2, 021802 (2017).
- Search for top squark pair production in compressed-mass-spectrum scenarios in proton-proton collisions at  $\sqrt{s} = 8$  TeV using the  $\alpha_T$  variable  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **767**, 403 (2017).
- Multiplicity and rapidity dependence of strange hadron production in pp, pPb, and PbPb collisions at the LHC  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **768**, 103 (2017).
- Measurements of the  $t\bar{t}$  production cross section in lepton+jets final states in pp collisions at 8 TeV and ratio of 8 to 7 TeV cross sections  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **77**, no. 1, 15 (2017).
- Search for supersymmetry in electroweak production with photons and large missing transverse energy in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **759**, 479 (2016).
- Search for heavy resonances decaying to two Higgs bosons in final states containing four b quarks  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **76**, no. 7, 371 (2016).
- Measurement of the  $Z\gamma \rightarrow \nu\bar{\nu}\gamma$  production cross section in pp collisions at  $\sqrt{s} = 8$  TeV and limits on anomalous  $ZZ\gamma$  and  $Z\gamma\gamma$  trilinear gauge boson couplings  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **760**, 448 (2016).
- Search for supersymmetry in the multijet and missing transverse momentum final state in pp collisions at 13 TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **758**, 152 (2016).
- Measurement of dijet azimuthal decorrelation in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **76**, no. 10, 536 (2016).
- Search for R-parity violating decays of a top squark in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **760**, 178 (2016).
- Combined search for anomalous pseudoscalar HVV couplings in  $VH(H \rightarrow b\bar{b})$  production and  $H \rightarrow VV$  decay  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Lett. B **759**, 672 (2016).
- Search for direct pair production of scalar top quarks in the single- and dilepton channels in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1607**, 027 (2016)  
Erratum: [JHEP **1609**, 056 (2016).]
- Search for supersymmetry in pp collisions at  $\sqrt{s} = 8$  TeV in final states with boosted W bosons and b jets using razor variables  
CMS Collaboration, A. M. Khachatryan *et al.*, Phys. Rev. D **93**, no. 9, 092009 (2016).
- Azimuthal decorrelation of jets widely separated in rapidity in pp collisions at  $\sqrt{s} = 7$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, JHEP **1608**, 139 (2016).
- Search for massive WH resonances decaying into the  $\ell\nu b\bar{b}$  final state at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **76**, no. 5, 237 (2016).
- Forward-backward asymmetry of Drell-Yan lepton pairs in pp collisions at  $\sqrt{s} = 8$  TeV  
CMS Collaboration, A. M. Khachatryan *et al.*, Eur. Phys. J. C **76**, no. 6, 325 (2016).

- Measurement of inclusive jet production and nuclear modifications in pPb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV  
CMS Collaboration, V. Khachatryan *et al.*, Eur. Phys. J. C **76**, no. 7, 372 (2016).

## Invited talks

- Florencia Canelli: Highlights from ICHEP  
Swiss Physical Society, 23-25 August 2016, Lugano, Switzerland
- Florencia Canelli: Results on Higgs Physics at the LHC  
CHEP, 3-10 August 2016, Chicago, U.S.

## Oral presentations

- Florencia Canelli: The top quark and its searches  
ETH and UZH Physics Colloquium 14 December 2016, Zurich, Switzerland.
- Florencia Canelli: The phase I pixel detector upgrade  
Universidad de San Martin HEP seminar 4 May 2016, Buenos Aires, Argentina.
- Silvio Donato: Run 1 Higgs legacy combination  
LHCP 2016, 13-16 June 2016, Lund, Sweden.
- Silvio Donato: Higgs Physics at CMS  
DISCRETE, 28 November - 3 December 2016, Warsaw, Poland
- Deborah Pinna : Dark Matter Searches at CMS and Future Plans  
Dark Side of the Universe conference, Bergen, 25 - 29 July 2016, Bergen, Norway.
- Claudia Seitz: SUSY search in the single lepton final state  
Helmholtz 2016, Physics at the Tera Scale, 21 - 23 November 2016 Hamburg, Germany.
- Giorgia Rauco: Jet performance in Run 2 of the LHC  
BOOST2016, Zurich, 18-22 July 2016, Zurich, Switzerland.
- Giorgia Rauco: Quark-gluon separation at the LHC  
Parton Radiation and Fragmentation from LHC to FCC-ee, CERN, 21- 22 November 2016, Meyrin, Switzerland.
- Giorgia Rauco: Distinguish quark and gluon jets at the CMS experiment  
Zurich PhD Seminar, 24 - 25 November 2016, Zurich, Switzerland.
- Giorgia Rauco: Quark vs Gluon discrimination Jet Substructure  
Planning for the future event 30 November - 1 December 2016, Batavia (IL), US.
- Giorgia Rauco: Search for single produced  $B'$  decaying to  $bH$  in the full-hadronic channel  
Beyond Two Generations Winter Workshop, CERN, 3- 4-December 2016, Meyrin, Switzerland.
- Giorgia Rauco : Distinguish quark and gluon jets at the CMS experiment  
Posters@LHCC, CERN, 22 February 2017, Meyrin, Switzerland.
- Daniel Salerno : Studies of Higgs bosons decaying to fermions with CMS  
LHC SKI 2016, Obergurgl University Center, Austria 10 -15 April 2016 Tirol, Austria.
- Daniel Salerno : Study of Higgs Production in Fermionic Decay Channels at CMS  
SUSY 2016, The University of Melbourne, Australia , 4 - 8 July 2016, Melbourne, Australia.
- Camilla Galloni : Tau identification in boosted topologies in CMS  
BOOST, 18- 22 July 2016, Zurich, Switzerland.
- Camilla Galloni : Search for signatures with top, bottom, tau and exotics  
pp@LHC Workshop 16 - 18 May 2016, Pisa, Italy.



- Annapaola de Cosa : Searches for Dark Matter at the LHC Seminar, University of Zurich, 4 April 2016, Zurich, Switzerland.
- Annapaola de Cosa : Searching for Dark Matter at colliders Università degli Studi di Napoli, FedericoII - seminar, 2 May 2016, Napoli, Italy.
- Annapaola de Cosa : DM + tt Dark Matter Brainstorming, London, 6 May 2016, London, U.K.
- Annapaola de Cosa: Searching for DM at CMS International conference on High Energy Physics: Theory to Experiment IHEP-T2E, Malaysia, 27 February - 1 March 2017, Kuala Lumpur, Malaysia.
- Annapaola de Cosa : Looking for DM with the CMS experiment Queen Mary University of London - seminar, 3 March 2017, London, U.K.
- Andreas Hinzmann : Search for new physics in bosonic final states at the LHC LHCP 2016, 13- 16 June 2016, Lund, Sweden.
- Lea Caminada : The Phase 1 Upgrade of the CMS Pixel Detector Imperial College London, UK - Seminar, 18 May 2016, London, U.K.
- Lea Caminada : Swiss participation in LHC experiments RECFA visit, Switzerland, 1 April 2016, Zurich, Switzerland.
- Ben Kilminster : New physics beyond the Higgs boson Universidad Nacional de San Martin particle seminar, 4 May 2016, Buenos Aires, Argentina.

### 20.1.9 LHCb

#### Articles

- Measurement of the  $B^\pm$  production asymmetry and the  $CP$  asymmetry in  $B^\pm \rightarrow J/\psi K^\pm$  decays LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **95** (2017) no.5, 052005.
- Observation of  $B_c^+ \rightarrow D^0 K^+$  decays LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **118** (2017) no.11, 111803.
- Observation of  $B_c^+ \rightarrow J/\psi D^{(*)} K^{(*)}$  decays LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **95** (2017) no.3, 032005.
- Measurement of the phase difference between short- and long-distance amplitudes in the  $B^+ \rightarrow K^+ \mu^+ \mu^-$  decay LHCb-Collaboration, R. Aaij *et al.*, Eur. Phys. J. C **77** (2017) 161.
- Measurement of the ratio of branching fractions and difference in  $CP$  asymmetries of the decays  $B^+ \rightarrow J/\psi \pi^+$  and  $B^+ \rightarrow J/\psi K^+$  LHCb-Collaboration, R. Aaij *et al.*, JHEP **1703** (2017) 036.
- Measurement of the  $b$ -quark production cross-section in 7 and 13 TeV  $pp$  collisions LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **118** (2017) no.5, 052002.
- Observation of the decay  $\Xi_b^- \rightarrow p K^- K^-$  LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **118** (2017) no.7, 071801.
- Search for decays of neutral beauty mesons into four muons LHCb-Collaboration, R. Aaij *et al.*, JHEP **1703** (2017) 001.
- Measurements of charm mixing and  $CP$  violation using  $D^0 \rightarrow K^\pm \pi^\mp$  decays LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **95** (2017) no.5, 052004.

- Measurement of the CKM angle  $\gamma$  from a combination of LHCb results  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1612** (2016) 087.
- Measurement of  $CP$  asymmetry in  $D^0 \rightarrow K^- K^+$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **767** (2017) 177.
- Measuring the Breaking of Lepton Flavour Universality in  $B \rightarrow K^* \ell^+ \ell^-$   
N. Serra, R. Silva Coutinho, D. van Dyk, Phys.Rev. D **95** (2017) no.3, 035029.
- Observation of the annihilation decay mode  $B^0 \rightarrow K^+ K^-$   
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **118** (2017) no.8, 081801.
- Measurement of forward  $t\bar{t}$ ,  $W + b\bar{b}$  and  $W + c\bar{c}$  production in  $pp$  collisions at  $\sqrt{s} = 8$  TeV  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **767** (2017) 110.
- Observation of the decay  $B_s^0 \rightarrow \phi \pi^+ \pi^-$  and evidence for  $B^0 \rightarrow \phi \pi^+ \pi^-$   
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **95** (2017) no.1, 012006.
- Search for the  $CP$ -violating strong decays  $\eta \rightarrow \pi^+ \pi^-$  and  $\eta'(958) \rightarrow \pi^+ \pi^-$   
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **764** (2017) 233.
- Observation of  $B^+ \rightarrow J/\psi 3\pi^+ 2\pi^-$  and  $B^+ \rightarrow \psi(2S)\pi^+ \pi^+ \pi^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Eur. Phys. J. C **77** (2017) no.2, 72.
- Measurement of matter-antimatter differences in beauty baryon decays  
LHCb-Collaboration, R. Aaij *et al.*, Nature Phys. (2017).
- 102** - Differential branching fraction and angular moments analysis of the decay  $B^0 \rightarrow K^+ \pi^- \mu^+ \mu^-$  in the  $K_{0,2}^*(1430)^0$  region  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1612** (2016) 065.
- Search for Higgs-like bosons decaying into long-lived exotic particles  
LHCb-Collaboration, R. Aaij *et al.*, Eur. Phys. J. C **76** (2016) no.12, 664.
- First experimental study of photon polarization in radiative  $B_s^0$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **118** (2017) no.2, 021801 Addendum: [Phys. Rev. Lett. **118** (2017) no.10, 109901].
- Measurement of  $CP$  violation in  $B^0 \rightarrow D^+ D^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **117** (2016) no.26, 261801.
- First study of the  $CP$  -violating phase and decay-width difference in  $B_s^0 \rightarrow \psi(2S)\phi$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **762** (2016) 253.
- Measurement of forward  $W \rightarrow e\nu$  production in  $pp$  collisions at  $\sqrt{s} = 8$  TeV  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1610** (2016) 030.
- Search for the suppressed decays  $B^+ \rightarrow K^+ K^+ \pi^-$  and  $B^+ \rightarrow \pi^+ \pi^+ K^-$   
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **765** (2017) 307.
- Amplitude analysis of  $B^- \rightarrow D^+ \pi^- \pi^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **94** (2016) no.7, 072001.
- Search for Structure in the  $B_s^0 \pi^\pm$  Invariant Mass Spectrum  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **117** (2016) no.15, 152003 Addendum: [Phys. Rev. Lett. **118** (2017) no.10, 109904].
- Measurement of the ratio of branching fractions  $\mathcal{B}(B_c^+ \rightarrow J/\psi K^+)/\mathcal{B}(B_c^+ \rightarrow J/\psi \pi^+)$   
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1609** (2016) 153.
- Measurement of the forward  $Z$  boson production cross-section in  $pp$  collisions at  $\sqrt{s} = 13$  TeV  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1609** (2016) 136.

- Measurement of the  $B_s^0 \rightarrow J/\psi\eta$  lifetime  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **762** (2016) 484.
- Study of  $B_c^+$  decays to the  $K^+K^-\pi^+$  final state and evidence for the decay  $B_c^+ \rightarrow \chi_{c0}\pi^+$   
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **94** (2016) no.9, 091102.
- Amplitude analysis of  $B^+ \rightarrow J/\psi\phi K^+$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **95** (2017) no.1, 012002.
- Observation of  $J/\psi\phi$  structures consistent with exotic states from amplitude analysis of  $B^+ \rightarrow J/\psi\phi K^+$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **118** (2017) no.2, 022003.
- Evidence for exotic hadron contributions to  $\Lambda_b^0 \rightarrow J/\psi p\pi^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **117** (2016) no.8, 082003 Addendum: [Phys. Rev. Lett. **117** (2016) no.10, 109902].
- Measurements of the S-wave fraction in  $B^0 \rightarrow K^+\pi^-\mu^+\mu^-$  decays and the  $B^0 \rightarrow K^*(892)^0\mu^+\mu^-$  differential branching fraction  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1611** (2016) 047.
- Measurement of the  $CP$  asymmetry in  $B_s^0 - \bar{B}_s^0$  mixing  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **117** (2016) no.6, 061803.
- Measurement of the CKM angle  $\gamma$  using  $B^0 \rightarrow DK^{*0}$  with  $D \rightarrow K_S^0\pi^+\pi^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1608** (2016) 137.
- Measurement of forward  $W$  and  $Z$  boson production in association with jets in proton-proton collisions at  $\sqrt{s} = 8$  TeV  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1605** (2016) 131.
- Model-independent evidence for  $J/\psi p$  contributions to  $\Lambda_b^0 \rightarrow J/\psi p K^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **117** (2016) no.8, 082002.
- Measurement of the properties of the  $\Xi_b^{*0}$  baryon  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1605** (2016) 161.
- A precise measurement of the  $B^0$  meson oscillation frequency  
LHCb-Collaboration, R. Aaij *et al.*, Eur. Phys. J. C **76** (2016) no.7, 412.
- Model-independent measurement of the CKM angle  $\gamma$  using  $B^0 \rightarrow DK^{*0}$  decays with  $D \rightarrow K_S^0\pi^+\pi^-$  and  $K_S^0K^+K^-$   
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1606** (2016) 131.
- Measurement of the mass and lifetime of the  $\Omega_b^-$  baryon  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **93** (2016) no.9, 092007.
- Measurement of  $CP$  observables in  $B^\pm \rightarrow DK^\pm$  and  $B^\pm \rightarrow D\pi^\pm$  with two- and four-body  $D$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **760** (2016) 117.
- Search for  $B_c^+$  decays to the  $p\bar{p}\pi^+$  final state  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **759** (2016) 313.
- Observation of  $\Lambda_b^0 \rightarrow \psi(2S)pK^-$  and  $\Lambda_b^0 \rightarrow J/\psi\pi^+\pi^-pK^-$  decays and a measurement of the  $\Lambda_b^0$  baryon mass  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1605** (2016) 132.
- Search for violations of Lorentz invariance and  $CPT$  symmetry in  $B_{(s)}^0$  mixing  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **116** (2016) no.24, 241601.
- Observation of the  $\Lambda_b^0 \rightarrow \Lambda\phi$  decay  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **759** (2016) 282.
- Observation of  $B_s^0 \rightarrow \bar{D}^0 K_S^0$  and evidence for  $B_s^0 \rightarrow \bar{D}^{*0} K_S^0$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **116** (2016) no.16, 161802.

- Observations of  $\Lambda_b^0 \rightarrow \Lambda K^+ \pi^-$  and  $\Lambda_b^0 \rightarrow \Lambda K^+ K^-$  decays and searches for other  $\Lambda_b^0$  and  $\Xi_b^0$  decays to  $\Lambda h^+ h'^-$  final states  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1605** (2016) 081.
- Measurement of the  $B_s^0 \rightarrow D_s^{(*)+} D_s^{(*)-}$  branching fractions  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **93** (2016) no.9, 092008.
- A new algorithm for identifying the flavour of  $B_s^0$  mesons at LHCb  
LHCb-Collaboration, R. Aaij *et al.*, JINST **11** (2016) no.05, P05010.
- First observation of  $D^0 - \bar{D}^0$  oscillations in  $D^0 \rightarrow K^+ \pi^- \pi^+ \pi^-$  decays and measurement of the associated coherence parameters  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **116** (2016) no.24, 241801.
- Constraints on the unitarity triangle angle  $\gamma$  from Dalitz plot analysis of  $B^0 \rightarrow DK^+ \pi^-$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **93** (2016) no.11, 112018 Erratum: [Phys. Rev. D **94** (2016) no.7, 079902].
- Measurement of the difference of time-integrated CP asymmetries in  $D^0 \rightarrow K^- K^+$  and  $D^0 \rightarrow \pi^- \pi^+$  decays  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. Lett. **116** (2016) no.19, 191601.
- Study of  $\psi(2S)$  production and cold nuclear matter effects in pPb collisions at  $\sqrt{s_{NN}} = 5$  TeV  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1603** (2016) 133.
- Observation of the  $B_s^0 \rightarrow J/\psi \phi \phi$  decay  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1603** (2016) 040.
- 104 - Study of  $D_{s1}^{(*)+}$  mesons decaying to  $D^+ K_S^0$  and  $D^{*0} K^+$  final states  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1602** (2016) 133.
- Angular analysis of the  $B^0 \rightarrow K^{*0} \mu^+ \mu^-$  decay using  $3 \text{ fb}^{-1}$  of integrated luminosity  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1602** (2016) 104.
- First observation of the rare  $B^+ \rightarrow D^+ K^+ \pi^-$  decay  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Rev. D **93** (2016) no.5, 051101 Erratum: [Phys. Rev. D **93** (2016) no.11, 119902].
- Measurements of long-range near-side angular correlations in  $\sqrt{s_{NN}} = 5 \text{ TeV}$  proton-lead collisions in the forward region  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **762** (2016) 473.
- Measurement of forward W and Z boson production in  $pp$  collisions at  $\sqrt{s} = 8 \text{ TeV}$   
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1601** (2016) 155.
- First observation of the decay  $D^0 \rightarrow K^- \pi^+ \mu^+ \mu^-$  in the  $\rho^0$ - $\omega$  region of the dimuon mass spectrum  
LHCb-Collaboration, R. Aaij *et al.*, Phys. Lett. B **757** (2016) 558.
- Production of associated Y and open charm hadrons in pp collisions at  $\sqrt{s} = 7$  and  $8 \text{ TeV}$  via double parton scattering  
LHCb-Collaboration, R. Aaij *et al.*, JHEP **1607** (2016) 052.

#### Invited lectures

- Olaf Steinkamp: The Eyes of the Particle Physicist  
Inaugural lecture, Zurich, March 20, 2017.

#### Oral presentations

- Patrick Haworth Owen: Heavy flavour physics at LHCb  
Aspen winter conference: From the LHC to dark matter and beyond, March 20–25, 2017.
- Rafael Silva Coutinho: Experimental results from  $b$ -hadron decays to three-body final states  
Mini-workshop: multi-particle final states in  $B$  decays, Siegen, Germany, February 21, 2017.

- Barbara Storaci: How operational works convert into physics: novel concepts from LHCb  
University of Liverpool, Liverpool, UK, January 13, 2017.
- Andrea Mauri: Heavy flavour highlights from LHCb  
XXIII Epiphany conference, Krakov, Poland, January 9–12, 2017.
- Elena Graverini: Semi-tauonic physics at LHCb  
Miami Conference on Elementary Particles, Astrophysics and Cosmology, Miami, Florida, USA, December 14–20, 2016, proceedings to be published in JPCS.
- Katharina Müller: Heavy Flavour and Quarkonia Production at LHCb  
Kruger2016 - Workshop on Discovery Physics at the LHC, Mpumulanga, South Africa, December 4–9, 2016, proceedings to be published in JPCS (<https://cds.cern.ch/record/2252717>).
- Olaf Steinkamp: CP violation in b and c-hadron decays at LHCb  
Kruger2016 - Workshop on Discovery Physics at the LHC, Mpumulanga, South Africa, December 4–9, 2016, proceedings to be published in JPCS (<https://cds.cern.ch/record/2256913>).
- Rafael Silva Coutinho: Heavy flavour spectroscopy at LHCb (including exotic states)  
Kruger2016–Workshop on Discovery Physics at the LHC, Mpumulanga, South Africa, December 4–9, 2016.
- Patrick Haworth Owen: Experimental mini-review on SL decays  
9th International Workshop on the CKM Unitarity Triangle, Mumbai, India, November 28– December 2, 2016.
- Marcin Chrzęszcz: Hunting for New Physics November 24, 2016  
H. Niewodniczanski institute of nuclear physics, Krakow, Poland, November 24, 2016.
- Marcin Chrzęszcz: New Physics signatures in Rare Decays from LHCb  
Adelaide university, Adelaide, Australia, October 25, 2016.
- Barbara Storaci: Tracking, calibration and alignment, and data processing in the LHCb upgrade  
VERTEX 2016, La Biodola, Italy, September 25–30, 2016.
- Marcin Chrzęszcz: Quark flavour anomalies of the SM  
12th Quark Confinement and the Hadron Spectrum, Thessaloniki, Greece, August 29–September 2, 2016.
- Patrick Haworth Owen: Rare B decays in the HL-LHC era  
Heavy Flavour physics at HL-LHC, Meyrin, Switzerland, August 31, 2016.
- Rafael Silva Coutinho: Charm, bottom and top production in the forward region  
QCD@LHC International Conference, Zurich, Switzerland, August 22–26, 2016.
- Katharina Müller: Impact of LHC measurements on parton density functions  
QCD@LHC International Conference, Zurich, Switzerland, August 22–26, 2016.
- Marcin Chrzęszcz: Search for massive neutrinos at LHCb and discovery potential of the FCC  
International Workshop on Neutrino Factories, Super Beams and Beta Beams, Quy Nhon, Vietnam, August 21–27, 2016.
- Federica Lionetto: Test of lepton flavour universality at LHCb  
International Workshop on Neutrino Factories, Super Beams and Beta Beams, Quy Nhon, Vietnam, August 21–27, 2016.
- Marcin Chrzęszcz: Anomalies in electroweak penguins at LHCb  
Meson-Nucleon Physics and the Structure of the Nucleon, Kyoto, Japan, July 25–30, 2016.
- Espen Eie Bowen: Rare semileptonic b-hadron decays at LHCb  
The 24th International Conference on Supersymmetry and Unification of Fundamental Interactions, Melbourne, Australia, July 3–8, 2016.

- Rafael Silva Coutinho: Rare decays at LHCb  
BEACH 2016: XIIth International Conference on Beauty, Charm, and Hyperons in Hadronic Interactions, Fairfax, Virginia, United States Of America, June 12–18, 2016.
- Katharina Müller: Impact of LHC measurements on parton density functions  
4th Conference on Large Hadron Collider Physics 2016 (LHCP 2016), Lund, Sweden, June 13–18, 2016.
- Rafael Silva Coutinho: Experimental review of three-body hadronic B-meson decays  
14th Conference on Flavor Physics and CP Violation, Pasadena, California, USA, June 6–9, 2016.
- Marcin Chrzaszc: Overview of LHCb results  
Collider Physics. 2nd Symposium of the Division for Physics of Fundamental Interactions of the Polish Physical Society, Katowice, Poland, May 13–15, 2016.
- Marcin Chrzaszc: Overview of recent experimental results in flavour physics  
Standard Model at LHC 2016, Pittsburgh, United States Of America, May 3–6, 2016.
- Christopher Betancourt: Radiation Damage in Silicon Detectors  
Zurich seminar, Zurich, April 25, 2016.
- Rafael Silva Coutinho: Additional measurements [ideas] of LF(U,v) tests at LHCb using Run-I and II data  
Rare B decays: theory and Experiment workshop, Barcelona, Spain, April 18–20, 2016.
- Katharina Müller: QCD at colliders  
24th International Workshop on Deep Inelastic Scattering and related subjects, Hamburg, Germany, April 11–15, 2016, Proceedings published PoS DIS **2016** (2016) 004.
- 106 - Barbara Storaci: LHCb measurements at 13 TeV with online data analysis exploiting new trigger and real time alignment and calibration  
LHC Ski 2016, Obergurgl, Austria, April 10–15, 2016.

## 20.2 Condensed matter

### 20.2.1 Condensed matter theory group

#### Articles

- Hallmarks of Hund's coupling in the Mott insulator  $\text{Ca}_2\text{RuO}_4$   
D. Sutter, C.G. Fatuzzo, S. Moser, M. Kim, R. Fittipaldi, A. Vecchione, V. Granata, Y. Sassa, F. Cossalter, G. Gatti, M. Grioni, H.M. Ronnow, N.C. Plumb, C.E. Matt, M. Shi, M. Hoesch, T.K. Kim, T.R. Chang, H.T. Jeng, C. Jozwiak, A. Bostwick, E. Rotenberg, A. Georges, T. Neupert, J. Chang, *Nature Comm.* (2017).
- Suppression of magnetic excitations near the surface of the topological Kondo insulator  $\text{SmB}_6$   
P. K. Biswas, M. Legner, G. Balakrishnan, M. Ciomaga Hatnean, M. R. Lees, D. McK. Paul, E. Pomjakushina, T. Prokscha, A. Suter, T. Neupert, and Z. Salman, *Phys. Rev. B* **95**, 020410(R) (2016).
- Topological Nonsymmorphic Metals from Band Inversion  
L. Muechler, A. Alexandradinata, T. Neupert, R. Car, *Phys. Rev. X* **6**, 041069 (2016).
- Robust spin-polarized midgap states at step edges of topological crystalline insulators  
P. Sessi, D. Di Sante, A. Szczerbakow, F. Glott, S. Wilfert, H. Schmidt, T. Bathon, P. Dziawa, M. Greiter, T. Neupert, G. Sangiovanni, T. Story, R. Thomale, M. Bode, *Science* **354**, 1269-1273 (2016).
- Density wave instabilities and surface state evolution in interacting Weyl semimetals  
M. Laubach, C. Platt, R. Thomale, T. Neupert, S. Rachel, *Phys. Rev. B* **94**, 241102(R) (2016).
- No-Go Theorem for Boson Condensation in Topologically Ordered Quantum Liquids  
T. Neupert, H. He, C. von Keyserlingk, G. Sierra, A. Bernevig, *New Journal of Physics* **18**, 123009 (2016).

#### Invited conference talks and colloquia

- Titus Neupert: Shiba lattices as novel platforms for topological superconductivity  
March Meeting of the American Physical Society, March 13–17, 2017, New Orleans, USA.
- Titus Neupert: Exotic fermions in topological metals  
Workshop on geometry in correlated quantum systems, August 22–25, 2017, Banff, Canada.
- Titus Neupert: Edge states of three-dimensional topological insulators  
Freie Universitaet Berlin, January 23, 2017, Berlin, Germany.
- Titus Neupert: Edge states of three-dimensional topological insulators  
University of Cologne, December 7, 2016, Cologne, Germany.
- Ashley Cook: Design Principles of Shift Current Photovoltaics  
University of Alberta, January 26, 2017, Alberta, Canada.

#### Invited lectures

- Titus Neupert: A cosmos of emergent particles in crystalline solids  
Inaugural lecture, University of Zurich, February 20, 2017, Zurich.
- Titus Neupert: Axiomatic topological quantum field theory  
School on Entanglement in Strongly Correlated Systems, February 6–17, 2017, Benasque, Spain.
- Titus Neupert: Interacting topological phases of matter  
3rd International Fall School Tocotronics2016, October 3–7, 2016, Wuerzburg, Germany.
- Titus Neupert: Floquet topological insulators  
Topological Matter School, August 22–26, 2016, Donostia-San Sebastian, Spain.

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#### Posters and oral presentations

- Ashley Cook: Design Principles of Shift Current Photovoltaics  
3rd International Fall School Tocotronics2016, October 3–7, 2016, Wuerzburg, Germany (poster).
- Frank Schindler: Higher-order topological insulators  
MaNEP Workshop on Topological Quantum Phenomena, November 21–22, 2016, Zurich, Switzerland (poster).
- Seulgi Ok: Magnetic Weyl and Dirac Kondo semimetal phases in heterostructures  
MaNEP Workshop on Topological Quantum Phenomena, November 21–22, 2016, Zurich, Switzerland (poster).
- Frank Schindler: Higher-order topological insulators  
34th Jerusalem Winter School, December 27–January 5, 2017, Jerusalem, Israel (poster).
- Ashley Cook: Design Principles of Shift Current Photovoltaics  
Topological Metamaterials conference, Aspen Center for Physics, January 2–8 2017, Aspen, CO, USA (poster).
- Frank Schindler: Higher-order topological insulators  
Workshop Entanglement in Strongly Correlated Systems, February 5–18, 2017, Benasque, Spain.
- Ashley Cook: Design Principles of Shift Current Photovoltaics  
Quantum Dynamics: From Models to Materials, Aspen Center for Physics, January 15–21 2017, Aspen, CO, USA (poster).
- Ashley Cook: Topological gapped edge states in fractional quantum Hall-superconductor heterostructures  
March Meeting of the American Physical Society, March 13–17, 2017, New Orleans, USA.
- Seulgi Ok: Magnetic Weyl and Dirac Kondo semimetal phases in heterostructures  
March Meeting of the American Physical Society, March 13–17, 2017, New Orleans, USA.
- Frank Schindler: Higher-order topological insulators  
March Meeting of the American Physical Society, March 13–17, 2017, New Orleans, USA.

## 20.2.2 Superconductivity and Magnetism

### Articles

- Magnetic field controlled charge density wave coupling in underdoped  $\text{YBa}_2\text{Cu}_3\text{O}_{6+x}$   
J. Chang, E. Blackburn, O. Ivashko, A. T. Holmes, N. B. Christensen, M. Hückler, Ruixing Liang, D. A. Bonn, W. N. Hardy, U. Rütt, M. v. Zimmermann, E. M. Forgan and S. M. Hayden, *Nature Communications* 7 11494 (2016)
- Hallmarks of Hund's coupling in the Mott insulator  $\text{Ca}_2\text{RuO}_4$   
D. Sutter, C.G. Fatuzzo, S. Moser, M. Kim, R. Fittipaldi, A. Vecchione, V. Granata, Y. Sassa, F. Cossalter, G. Gatti, M. Grioni, H.M. Ronnow, N.C. Plumb, C.E. Matt, M. Shi, M. Hoesch, T.K. Kim, T.R. Chang, H.T. Jeng, C. Jozwiak, A. Bostwick, E. Rotenberg, A. Georges, T. Neupert, J. Chang, arXiv:1610.02854 (Accepted in *Nature Communications* 2017)
- Damped spin-excitations in a doped cuprate superconductor with orbital hybridization  
O. Ivashko, N. E. Shaik, X. Lu, C. G. Fatuzzo, M. Dantz, P. G. Freeman, D. E. McNally, D. Destraz, N. B. Christensen, T. Kurosawa, N. Momono, M. Oda, C. Monney, H. M. Rønnow, T. Schmitt, J. Chang, arXiv:1702.02782

### Conference contributions

- Christian Matt:  $\text{NaFe}_{0.56}\text{Cu}_{0.44}\text{As}$ : A pnictide insulating phase induced by on-site Coulomb interaction  
March Meeting American Physical Society, 13. – 17. March 2017, New Orleans, Louisiana, USA.
- Johan Chang: Diffraction in Pulsed-Magnetic Fields: Problem solver for Superconductors  
Satellite meeting to the European XFEL Users meeting, 24 January 2017, Hamburg, Germany .
- Denys Sutter: Twofold insulating energy scales in the Mott-insulator  $\text{Ca}_2\text{RuO}_4$   
SPS Jahrestagung, 25. August 2016, Lugano, Switzerland.
- Johan Chang: Magnetic-field control of high-temperature superconductivity and charge order  
MaNEP meeting, 6. – 9. July 2016, Les Diableret, Switzerland .
- Johan Chang: Magnetic-field control of high-temperature superconductivity and charge order  
Spectroscopies in Novel Superconductors (SNS2016), 19. – 24. June 2016, Stuttgart.
- Johan Chang: Magnetic-field control of high-temperature superconductivity and charge order  
International workshop (SCHTC16), 23. –27. May 2016, Dresden.
- Johan Chang: Magnetic-field control of high-temperature superconductivity and charge order  
Probing Superconductivity at the Nanoscale, 15. – 18. April 2016, Saas Fee, Switzerland.

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## 20.2.3 Phase transitions and superconducting photon detectors

### Articles

- Tuning the critical magnetic field of the triplon Bose-Einstein condensation in  $\text{Ba}_{3-x}\text{Sr}_x\text{Cr}_2\text{O}_8$   
H. Grundmann, A. Gazizulina, F. von Rohr, L. Peters, T. Förster and, A. Schilling, *New. J. Phys.* **18** (2016) 033001.
- Cobalt complexes of tetradentate, bipyridine-based macrocycles: their structures, properties and photocatalytic proton reduction  
E. Joliat, S. Schnidrig, B. Probst, C. Bachmann, B. Spingler, K.K. Baldrige, F. von Rohr, A. Schilling and R. Alberto, *Dalton Trans.* **45** (2016) 1737.
- Field-induced transition of the magnetic ground state from A-type antiferromagnetic to ferromagnetic order in  $\text{CsCo}_2\text{Se}_2$   
F. von Rohr, A. Krzton-Maziopa, V.Yu. Pomjakushin, H. Grundmann, Z. Guguchia, W. Schnick, and A. Schilling, *J. Phys.: Condensed Matter.* **28** (2016) 276001.
- Characteristics of superconducting tungsten silicide  $\text{W}_x\text{Si}_{1-x}$  for single photon detection  
X. Zhang, A. Engel, Q. Wang, A. Schilling, A. Semenov, M. Sidorova, H.-W. Hübers, I. Charaev, K. Ilin, and M. Siegel, *Phys. Rev. B* **94** (2016) 174509.



- Superconducting single X-ray photon detector based on  $W_{0.8}Si_{0.2}$   
X. Zhang, Q. Wang, and A. Schilling, *AIP Advances* 6 (2016) 115104.

#### Conference contributions

- Q. Wang: Position dependent detection efficiency in NbN SSPDs  
Workshop of Nanowire Superconducting Single Photon Detectors, 28. November – 1. December 2016, Leiden (NL).
- X. Zhang: Superconducting nanowire single X-ray photon detectors based on WSi (Poster)  
Workshop of Nanowire Superconducting Single Photon Detectors, 28. November – 1. December 2016, Leiden (NL).
- A. Gazizulina: Magnetic excitations in the spin-dimer system  $Ba_{0.1}Sr_{2.9}Cr_2O_8$   
Helmholtz Zentrum HZB User Meeting, 7. – 10. December 2016, Berlin, Germany.
- X. Zhang: Hotspot dynamics in WSi materials  
Workshop of Nanowire Superconducting Single Photon Detectors, 28. November – 1. December 2016, Leiden (NL).
- Q. Wang: Local response of a superconducting nanowire single-photon detector (Poster)  
Single Photons Single Spins (SPSS) Meeting, 12. – 13. September 2016, Oxford University, UK.
- X. Zhang: Hotspot dynamics of Superconducting Nanowire Single Photon Detectors  
Applied Superconductivity Conference, 4. – 9. September 2016, Denver CO (U.S.A.).
- A. Gazizulina: Study of the Magnetic Excitations in the Dimer Compound  $Ba_{3-x}Sr_xCr_2O_8$   
SPS Annual meeting, 23. – 25. August 2016, Lugano, Switzerland.
- A. Gazizulina: Study of the Magnetic Excitations in the Dimer Compound  $Ba_{3-x}Sr_xCr_2O_8$  (Poster)  
Workshop MaNEP, 6. – 8. July 2016, Les Diablerets, Switzerland.

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#### 20.2.4 Surface Physics

##### Articles

- Circular Dichroism in Cu Resonant Auger Electron Diffraction  
F. Matsui, N. Maejima, Hirosuke Matsui, H. Nishikawa, H. Daimon, T. Matsushita, M. Muntwiler, R. Stania, T. Greber, *Z. Phys. Chemie*, 230, 519 (2016)
- Self-assembly of nanoscale lateral segregation profiles  
R. Stania, W. Heckel, I. Kalichava, C. Bernard, T. C. Kerscher, H. Y. Cun, P. R. Willmott, B. Schönfeld, J. Osterwalder, S. Müller, and T. Greber, *Phys. Rev. B* 93, 161402 (2016)
- Sputtering-induced reemergence of the topological surface state in  $Bi_2Se_3$   
R. Queiroz, G. Landolt, S. Muff, B. Slomski, T. Schmitt, V. N. Strocov, J. Mi, B. Brummerstedt Iversen, P. Hofmann, J. Osterwalder, A. P. Schnyder, and J. H. Dil, *Phys. Rev. B* 93, 165409 (2016)
- Switching stiction and adhesion of a liquid on a solid  
S. F. L. Mertens, A. Hemmi, S. Muff, O. Gröning, S. De Feyter, J. Osterwalder and T. Greber, *Nature* 534, 676 (2016)
- Access to phases of coherent phonon excitations by femtosecond ultraviolet photoelectron diffraction  
M. Greif, L. Kasmi, L. Castiglioni, M. Lucchini, L. Gallmann, U. Keller, J. Osterwalder, and M. Hengsberger, *Phys. Rev. B* 94, 054309 (2016)
- Application of iterative phase-retrieval algorithms to ARPES orbital tomography  
P. Kliuiev, T. Latychevskaia, J. Osterwalder, M. Hengsberger and L. Castiglioni, *New J. Phys.* 18, 093041 (2016)
- Triangular Monometallic Cyanide Cluster Entrapped in Carbon Cage with Geometry-Dependent Molecular Magnetism  
F. Liu, C-L. Gao, Q. Deng, X. Zhu, A. Kostanyan, R. Westerström, S. Wang, Y-Z. Tan, J. Tao, S-Y. Xie, A. Popov, T. Greber, and SF. Yang, *J. Am. Chem. Soc.* 138, 14764 (2016)

- Delayed electron emission in strong-field driven tunnelling from a metallic nanotip in the multi-electron regime  
H. Yanagisawa, S. Schnepf, C. Hafner, M. Hengsberger, D. E. Kim, M. F. Kling, A. Landsman, L. Gallmann, J. Osterwalder, *Sci. Rep.* 6, 35877 (2016)
- Laser-induced asymmetric faceting and growth of a nano-protrusion on a tungsten tip  
H. Yanagisawa, V. Zadin, K. Kunze, C. Hafner, A. Aabloo, D. E. Kim, M. F. Kling, F. Djurabekova, J. Osterwalder, and W. Wuensch, *APL Photonics* 1, 091305 (2016)
- Some Like It Flat: Decoupled h-BN Monolayer Substrates for Aligned Graphene Growth  
S. Roth, T. Greber and J. Osterwalder, *ACS Nano* 10, 11187 (2016)
- Subsurface Oxygen in Oxide-Derived Copper Electrocatalysts for Carbon Dioxide Reduction  
A. Eilert, F. Cavalca, F. S. Roberts, J. Osterwalder, C. Liu, M. Favaro, E. J. Crumlin, H. Ogasawara, D. Friebe, L. G. M. Pettersson, and A. Nilsson, *J. Phys. Chem. Lett.* 8, 285 (2016)
- Mononuclear Clusterfullerene Single-Molecule Magnet Containing Strained Fused-Pentagons Stabilized by a Nearly Linear Metal Cyanide Cluster  
F. Liu, S. Wang, C.-L. Gao, Q. Deng, X. Zhu, A. Kostanyan, R. Westerström, F. Jin, S.-Y. Xie, A. A. Popov, T. Greber and S. Yang, *Angew. Chem. Int. Ed.* 56, 1830 (2017)
- Surface science at the PEARL beamline of the Swiss Light Source  
M. Muntwiler, J. Zhang, R. Stania, F. Matsui, P. Oberta, U. Flechsig, L. Patthey, C. Quitmann, T. Glatzel, R. Widmer, E. Meyer, T. A. Jung, P. Aebi, R. Fasel and T. Greber, *J. Synchrotron Rad.* 24, 354 (2017)
- Sensitivity of photoelectron diffraction to conformational changes of adsorbed molecules: Tetra-tert-butyl-azobenzene/Au(111)  
A. Schuler, M. Greif, A. P. Seitsonen, G. Mette, L. Castiglioni, J. Osterwalder and M. Hengsberger, *Struct. Dyn.* 4, 015101 (2017)
- Reading and writing single-atom magnets  
F.D. Natterer, K. Yang, W. Paul, P. Willke, T. Choi, T. Greber, A.J. Heinrich and C.P. Lutz, *Nature* 354, 226 (2017)

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## Contributed conference presentations

- L. Castiglioni: Accessing the photoemission phase by attosecond interferometry (Poster)  
PLESI 16 Focus Workshop, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 26.04.2016.
- P. Kliuiev: Phase retrieval problem in molecular wave function imaging (Poster)  
PLESI 16 Focus Workshop, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 26.04.2016.
- W.-D. Zabka: Wet-chemical deposition of Re-photosensitizers on alumina/NiAl(110)  
11th MOLCH discussion, Bern, Switzerland, 13.06.2016.
- P. Kliuiev: Phase problem in photoemission-based imaging of molecular wave functions (Poster)  
Local 3D atomic and electronic structure imaging of functionally active sites, Satellite workshop of VUVX 2017, Zurich, Switzerland, 01.07.2016.
- C. Monney: Transient band gap enhancement in the excitonic insulator phase of Ta<sub>2</sub>NiSe<sub>5</sub> upon photoexcitation  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 03.07.2016.
- W.-D. Zabka: Electron spectroscopy on thin oxide films: Crystalline alumina of variable thickness on NiAl(110) (Poster)  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 04.07.2016.
- L. Castiglioni: Final state effects in attosecond photoemission from solids (Poster)  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 04.07.2016.
- K. Waltar: Investigations on the adsorption geometry of CO adsorbed on Pt(111) (Poster)  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 04.07.2016.
- A. Kostanyan: Investigation of magnetic properties of R<sub>1</sub>M<sub>2</sub>N@C<sub>80</sub> (R = Dy, Tb, Ho; M = Sc, Lu) endohedral metallofullerenes by means of X-ray magnetic circular dichroism (XMCD) and SQUID magnetometry (Poster)  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 04.07.2016.

- A. Schuler: Sensitivity of photoelectron diffraction to conformational changes of adsorbed molecules: Tetra-tert-butyl-azobenzene/Au(111) (Poster)  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 04.07.2016.
- D. Leuenberger: Ultrafast dehybridisation between f- and d-states in a Heavy-Fermion System  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 04.07.2016.
- P. Kliuiev: Reconstruction of molecular wave functions from angle-resolved photoemission data  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 05.07.2016.
- M. Hengsberger: Study of structural dynamics by means of time- and angle-resolved photoelectron spectroscopy and diffraction  
39th International conference on Vacuum Ultraviolet and X-ray Physics (VUVX), Zurich, Switzerland, 06.07.2016.
- A. Kostanyan: Switching the molecular conformation of endohedral single-molecule magnets using magnetic torque  
SPS meeting, Lugano, Switzerland, 23.08.2016.
- C. Bernard: Single-Domain Transfer and Stacking of  $sp^2$ -Layers on a 4inch-Scale  
SPS meeting, Lugano, Switzerland, 24.08.2016.
- J. Osterwalder: Adsorption studies of molecular catalysts and photosensitizers on metal oxide surfaces  
Symposium and Summer School: Solar Light to Chemical Energy Conversion, Les Diablerets, Switzerland, 29.08.2016.
- D. Leuenberger: Band Bending Effects and Atomically Resolved Charge Transfer in a Photocatalytic Heterojunction (Poster)  
Symposium and Summer School: Solar Light to Chemical Energy Conversion, Les Diablerets, Switzerland, 30.08.2016.
- W.-D. Zabka: Electron Dynamics in Re-photosensitizers on thin Alumina Films (Poster)  
Symposium and Summer School: Solar Light to Chemical Energy Conversion, Les Diablerets, Switzerland, 31.08.2016.
- P. Kliuiev: Reconstruction of molecular wave functions from angle-resolved photoemission data (Poster)  
International Science@FELs Conference, Trieste, Italy, 05.09.2016.
- H.Y. Cun: Nanotents - 2nm void-formation and self-healing in 2D monolayers on metals  
TNT Conference Fribourg, Switzerland, 08.09.2016.
- C. Monney: Transient band gap enhancement in the excitonic insulator phase of Ta<sub>2</sub>NiSe<sub>5</sub> upon photoexcitation  
2nd Workshop on Ultrafast Dynamics in Strongly correlated Systems, PSI, Villigen, Switzerland, 10.10.2016.
- H.Y. Cun: Nanotents and 2nm void-formation in 2D materials  
SICC9 Conference Singapore, Singapore, 14.12.2016.
- W.-D. Zabka: Ultrathin Alumina on NiAl(110): Functionalization with Self-Assembled Monolayers  
33rd SAOG Meeting, Fribourg, Switzerland, 27.01.2017.
- A. Hemmi: Shedding light on large molecule assisted wet transfer of single orientation single layer CVD boron nitride  
Workshop on synthetic methods across the flagship, Tenerife, Spain, 07.02.2017.
- T. Greber: 4f Single Molecule Magnets  
32nd High Tc Workshop on Novel Materials and Superconductivity , Obertraun, Austria, 17.02.2017.
- T. Greber: Interaction across a single layer of carbon (Poster)  
3S - Symposium on Surface Science 2017, St. Moritz, Switzerland, 07.03.2017.
- L. Castiglioni: Direct reconstruction of molecular wave functions by ARPES orbital tomography  
3S - Symposium on Surface Science 2017, St. Moritz, Switzerland, 09.03.2017.
- A. Kostanyan: Changing the Molecular Conformation of Endohedral Rare Earth Single-Molecule Magnets with Magnetic Torque  
DPG Tagung, Dresden, Germany, 21.03.2017.

## Invited lectures

- C. Monney: Probing the out-of-equilibrium dynamics of an exciton condensate  
Probing Superconductivity at the Nanoscale, COST meeting Saas-Fee, Switzerland, 03.04.2016.
- J. Osterwalder: Photoelectron diffraction and holography; Hard x-ray photoelectron spectroscopy and ambient pressure XPS  
3 hours lecture, School on Synchrotron and Free Electron Laser Based Methods: Multidisciplinary Applications and Perspectives, ICTP Trieste, Italy, 12.04.2016.
- T. Greber: One layer of Boron Nitride on Rhodium: From Nanomesh to Nanotents  
IBS Center for Multidimensional Carbon Materials (CMCM), Ulsan, South Korea, 13.04.2016.
- T. Greber: The electronic structure of single layer h-BN and graphene on transition metals: From Nanomesh to quantum dots  
Center for Artificial Low Dimensional Electronic Systems Institute for Basic Science (POSTECH Campus), CALDES Seminar, Pohang, South Korea, 15.04.2016.
- C. Monney: Looking for a realization of the excitonic insulator phase in low-dimensional crystals  
Photon Science Seminar, PSI, Villigen, Switzerland, 15.04.2016.
- T. Greber: Bottom-up nanoscience: From nano-tents to endohedral Fullerenes  
1st workshop on Quantum Nanosciences at EWHA University, Seoul, South Korea, 19.04.2016.
- T. Greber: Accessing the magnetic content of endohedral Fullerenes  
Korean physical society (KPS) Meeting, Daejeong, South Korea, 21.04.2016.
- J. Osterwalder: Final state scattering in electronic structure imaging by ARPES  
Workshop on Prospects and Limitations of Electronic structure imaging by ARPES, MPI Physik komplexer Systeme, Dresden, Germany, 25.04.2016.
- T. Greber: From Nanomesh in the vacuum to smart membranes in liquids  
HKUST Seminar, Hong Kong, China, 25.04.2016.
- T. Greber: 4f single molecule magnets in Fullerenes  
Jeffrey Long Group Seminar, U Berkeley, U.S.A., 03.06.2016.
- T. Greber: Magnets inside C<sub>80</sub>  
Seminar U. Lincoln, Nebraska, U.S.A., 08.06.2016
- J. Osterwalder: Ultrafast electron dynamics and scattering  
Conference on "The future of x-ray and Electron Spectroscopy", Uppsala, Sweden, 15.06.2016.
- T. Greber: Looking inside magnetic Endofullerenes with x-rays  
Seminar LBNL, Berkeley, U.S.A., 15.06.2016.
- T. Greber: From Double-deckers to Spin-shuttles: 4f Single Molecule magnets  
Seminar U Stanford, Stanford, U.S.A., 23.06.2016
- T. Greber: Single layer boron nitride: From Nanomesh in the vacuum to smart membranes in liquids  
Ames Lab NASA, Moffett Field, U.S.A., 25.06.2016.
- R. Stania: Conformational changes in TbSc<sub>2</sub>N@C<sub>80</sub> on h-BN/Ni(111)  
POSTECH, Pohang, South Korea., 02.08.2016.
- C. Monney: How fast can we close the gap, and how fast does it recover?  
TNT Conference, Fribourg, Switzerland, 08.09.2016.
- T. Greber: Single layer boron nitride: From Nanomesh to smart membranes in liquids  
TNT Conference, Fribourg, Switzerland, 08.09.2016.

- T. Greber: Building blocks for molecular spintronics: Endohedral rare earth single molecule magnets? Workshop on experimental Physics, EWha University, Seoul, South Korea, 31.10.2016.
- T. Greber: Hexagonales Bornitrid: Eine dünnst mögliche zweidimensionale Membran Kolloquium GDCh, Hanover, 10.11.2016.
- Z. Novotny: Model catalytic oxide systems: From clusters to single atoms CEITEC Nano user meeting, Brno, Czech Republic, 01.12.2017.
- L. Castiglioni: Attosecond delays in valence band photoemission from metals International Workshop on Atomic Physics, Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 01.12.2016.
- T. Greber: Changing molecular conformation with magnetic torque SSNS Conference, Furano, Japan, 14.01.2017.
- C. Monney: RIXS as a tool to measure short-range magnetic order Spectroscopy of Novel Materials, Group Workshop, Saas-Grund, Switzerland, 15.01.2017.
- C. Monney: Time-resolved photoemission of ordered phases in low dimensional materials 21st Hiroshima international symposium on synchrotron radiation, Hiroshima, Japan, 03.03.2017.

## 20.2.5 Biological systems

### Articles

- Imaging proteins at the single molecule level  
J.-N. Longchamp, S. Rauschenbach, S. Abb, C. Escher, T. Latychevskaia, K. Kern and H.-W. Fink, PNAS 114(7), 1474 - 1479 (2017).
- Application of iterative phase-retrieval algorithms to ARPES orbital tomography  
P. Kliuiev, T. Latychevskaia, J. Osterwalder, M. Hengsberger and L. Castiglioni, New Journal of Physics 18, 093041 (2016).
- Direct observation of individual charges and their dynamics on graphene by low-energy electron holography  
T. Latychevskaia, F. Wicki, J.-N. Longchamp, C. Escher and H.-W. Fink, Nano Letters 16 (9), 5469 - 5474 (2016).
- Resolution enhancement by extrapolation of coherent diffraction images: a quantitative study about the limits and a numerical study of non-binary and phase objects  
T. Latychevskaia, Y. Chushkin and H.-W. Fink, Journal of Microscopy 264 (1), 3 - 13 (2016).
- Mapping unoccupied electronic states of freestanding graphene by angle-resolved low-energy electron transmission  
F. Wicki, J.-N. Longchamp, T. Latychevskaia, C. Escher, H.-W. Fink, Phys. Rev. B 94 (7), 075424 (2016).
- Creating Airy beams employing a transmissive spatial light modulator  
T. Latychevskaia, D. Schachtler and H.-W. Fink, Applied Optics 55 (22), 6095 - 6101 (2016).
- Inverted Gabor holography principle for tailoring arbitrary shaped three-dimensional beams  
T. Latychevskaia and H.-W. Fink, Scientific Reports 6, 26312 (2016).

### Patents

- Method and apparatus for imaging single molecules  
Inventors: Jean-Nicolas Longchamp, Conrad Escher, Hans-Werner Fink  
PCT application number: PCT/EP2016/065222, June 29th, 2016.

### Invited talks

- Jean-Nicolas Longchamp: Imaging Single Proteins  
Seminar for Professorship Position, EPFL, Lausanne, Switzerland February 2nd, 2017.

- Jean-Nicolas Longchamp: Imaging Single Proteins  
Free-Space Quantum Electron Optics, Half Moon Bay, USA, October 14-15, 2016.
- Jean-Nicolas Longchamp: Imaging Single Proteins  
ACS National Meeting, Symposium on Advances in Biological Imaging, Philadelphia, USA, August 21-25, 2016.
- Jean-Nicolas Longchamp: Imaging Single Proteins  
Seminar in Structural Biology, SGC Oxford, United Kingdom, June 1st, 2016.
- Jean-Nicolas Longchamp: Imaging Single Proteins  
Seminar in Physics, EPFL, Lausanne, Switzerland, May 12, 2016.
- Jean-Nicolas Longchamp: Imaging Single Proteins  
Seminar in Structural Biology, University of Pavia, Pavia, Italy, April 15, 2016.
- Tatiana Latychevskaia: Coherent imaging with low-energy electrons (30 - 250 eV): Imaging charged impurities and three-dimensional topography of graphene  
Electron Holography Workshop organized by the Japanese government at the Hitachi facility, Tokyo, Japan, February 2017.
- Hans-Werner Fink: Holography with Low-Energy Electrons: A Tool for Single Molecule Structural Biology  
Molecular Nanosystems, Congressi Stefano Franscini, Monte Verità, Ascona, March 5-10, 2017.

#### Poster Presentations

- Marianna Lorenzo: Investigation of alkali metal adsorption on freestanding graphene  
European Graphene Forum 2016, Paris, France, June 01-03, 2016.
- Marianna Lorenzo: Low -energy electron point source microscopy  
Graphene 2016 Conference, Genova, Italy, April 19-22, 2016.
- Flavio Wicki: Visualization of unoccupied states in the electronic structure of freestanding graphene by means of LEEPS microscopy  
Graphene 2016 Conference, Genova, Italy, April 19-22, 2016.

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### 20.2.6 Disordered and Biological Soft Matter

#### Articles

- Can Anderson localization of light be reached with white paint?  
T. Sperling, L. Schertel, M. Ackermann, G. Aubry, C.M. Aegerter, and G. Maret, *New Journal of Physics*, **18** 013039 (2016).
- SnapShot: Mechanical forces in Development I  
L. Pasakarnis, D. Dreher, and D. Brunner, *Cell* **165** 754 (2016).
- SnapShot: Mechanical forces in Development II  
D. Dreher, L. Pasakarnis, and D. Brunner, *Cell* **165** 1028 (2016).
- Looking Beyond the Genes: The Interplay Between Signaling Pathways and Mechanics in the Shaping and Diversification of Epithelial Tissues.  
S. Urdy, N. Goudemand, and S. Pantalacci, *Current Topics in Developmental Biology* **119** 227 (2016).
- Structured illumination behind turbid media.  
A. Malavalli, M. Ackermann, and C.M. Aegerter, *Opt. Exp.* **24** 23018 (2016).
- Mechanical forces in organ growth  
D. Eder, C.M. Aegerter, and K. Basler, *Mech. Dev.* **144** 53 (2017).

#### Articles in press

- Faraday-Effect in multiply scattered light  
L. Schertel, M. Ackermann, G. Aubry, C.M. Aegerter, and G. Maret, *Europ. Phys J. E* (2017).

#### Conference reports

- P. Dagenais: Determining forces from hydrodynamic flows  
Fluid Mechanics and Collective Behavior: "From Cells to Organisms", Monte Verità, Ascona, Switzerland, April 2 - 7, 2016.
- F. Atzeni: Modelling active contractions in a multicellular embryonic tissue  
Summer School on Biomechanics of Soft Tissue: "Multiscale Modeling, Simulation and Application", Graz University of Technology, July 4-8th, 2016.
- S. Puri: Determining the mechanical properties of zebrafish caudal fins  
Sinergia retreat, Olten, Switzerland, September 1, 2016.
- P. Dagenais: Determining forces from hydrodynamic flows  
Sinergia retreat, Olten, Switzerland, September 1, 2016.
- S. Urdy: Phenoid3D: a high-throughput image-processing tool to quantify organoid phenotypes in 3D in vitro culture using spinning disk confocal microscopy  
EMBL conference: "Organoids: Modelling Organ Development and Disease in 3D Culture", Heidelberg, Germany, October 12 - 15, 2016.
- J. Schneider: Dynamic light sheet generation in turbid tissue  
Biomedical Optics and Photonics Network Meeting, USZ, Zurich, Switzerland, November 28, 2016 (Poster).
- A. Malavalli: Structured illumination behind turbid media  
Biomedical Optics and Photonics Network Meeting, USZ, Zurich, Switzerland, November 28, 2016 (Poster).
- F. Atzeni: Mechanochemical modelling as an explorative tool to study *Drosophila* dorsal closure  
Biology for Physics: "Is there new physics in living matter?", Barcelona Biomedical Research Park (PRBB), January 15-18th, 2017 (Poster).
- F. Atzeni: Mechanochemical modelling as an explorative tool to study *Drosophila* dorsal closure  
IMLS Retreat 2017, Emmetten, January 18-20th, 2017.
- D. Dreher: SPIM of whole *Drosophila* embryos  
IMLS Retreat 2017, Emmetten, January 18-20th, 2017 (Poster).

#### Invited lectures

- C.M. Aegerter: Scaling and dimensional analysis in Biology  
Course in Plant and Animal development, ENS, Lyon, 25. May 2016.
- C.M. Aegerter: Mechanical forces in Development  
Developmental Biology seminar, ENS, Lyon, 25. May 2016.
- C.M. Aegerter: Quattro Stagioni, Frühling und Sommer  
Theater am Rigiblick, Zurich, 17. June 2016.
- C.M. Aegerter: Biological Physics and Physical Biology  
Biophysics Minisymposium, UZH, Zurich, 23. June 2016.
- C.M. Aegerter: Quattro Stagioni, Herbst und Winter  
Theater am Rigiblick, Zurich, 24. June 2016.
- C.M. Aegerter: Force Measurement and Mechanical Properties in the Wing Disc  
KITP Programme "From Genes to Growth and Form", Santa Barbara, USA, 16. August 2016.

- J. Schneider: Fluorescence imaging in biological tissue  
PostDoc Day, Schloss Au, Switzerland, 20. October 2016.
- C.M. Aegerter: Physikalische Weihnachtsvorlesung  
Kinderuniversität Winterthur, Winterthur, Switzerland, 14. December 2016.
- C.M. Aegerter: Molecular force sensors in Drosophila tissues  
Soft matter seminar, University of Konstanz, Konstanz, Germany, 13. January 2017.
- C.M. Aegerter: Firlefax der Wettermacher  
Gemeindezentrum Wipkingen, Zürich, Switzerland, 4. March 2017.
- S. Urdy: From molluscan shell growth to epithelial morphogenesis: the influence of D'Arcy Thompson  
Workshop: "The biological challenges in morphogenesis", Mathematical Biosciences Institute, Ohio, USA, 20. February 2017.

## 20.3 PhD, Master and Bachelor Theses

### 20.3.1 PhD Theses

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- Heavy-Quark Pair Production at Hadron Collider: Transverse-Momentum Resummation, NNLO Corrections and Azimuthal Asymmetries  
Hayk Sargsyan, PhD thesis, March 2017.
- Tracking and Particle Identification at LHCb and Strange Hadron Production in Events with Z Boson  
Marco Tresch, PhD thesis, February 2017.
- Searching for Dark Matter with XENON100, Research and Development for XENON1T, and Modulating Radioactive Decay Rates  
Peter Barrow, PhD thesis, February 2017.
- Upstream Tracking and the Decay  $B^0 \rightarrow K^+ \pi^- \mu^+ \mu^-$  at the LHCb Experiment  
Espen Eie Bowen, PhD thesis, January 2017
- Search for Dark Matter in Association with Top Quarks with the CMS Detector  
Deborah Pinna, PhD thesis, January 2017.
- Photomultiplier Tubes for the XENON1T Dark Matter Experiment and Studies on the XENON100 Electromagnetic Background  
Daniel Mayani Paras, PhD thesis, December 2016.
- Topics in non-perturbative quantum field theory  
Peter Lowdon, PhD thesis, November 2016.
- Mechanical forces in growth regulations - challenging force measurements and force manipulations in the Drosophila wing imaginal disc  
Dominik Eder, PhD Thesis, Universität Zürich, 2016
- Scintillating Fiber Detector for the Mu3e Experiment  
Roman Gredig, PhD thesis, October 2016.
- Precise Predictions for Top-quark Pair Production in Association with Multiple Jets  
Niccolò Moretti, PhD thesis, October 2016.
- Regularization-scheme dependence of QCD amplitudes  
Andrea Visconti, PhD thesis, September 2016.
- Nanotemplates and Conformations of Tri-Metal Endofullerenes on Surfaces  
Roland Stania, PhD thesis, September 2016.



- Four Novel Electron Point Source Applications  
Flavio Wicki, PhD thesis, September 2016.
- Low Mass WIMP Detection with CCDs  
Junhui Liao, PhD thesis, September 2016.
- Top-Bottom Interference for Higgs Production in Gluon Fusion at NLO in QCD  
Gizem Oeztürk, PhD thesis, June 2016.
- Inelastic WIMP-Nucleus Interactions in XENON100 and Cables and Connectors for XENON1T  
Gaudenz Kessler, PhD thesis, June 2016.

### 20.3.2 Master theses

- Probing Lepton Flavor Universality with  $K \rightarrow \pi \nu \bar{\nu}$  decays  
Joachim Monnard, Master thesis ETH, March 2017.
- Hydrodynamic analysis of swimming zebrafish in the context of fin regeneration  
Ronny Rüttimann, Master thesis, December 2016.
- Bifold insulating energy scales in the Mott-insulator  $\text{Ca}_2\text{RuO}_4$   
Denys Sutter, Master thesis, October 2016.
- $U(2)$  flavor symmetry and a general EFT approach to  $B$ -decay anomalies  
Sokratis Trifinopoulos, Master thesis ETH, September 2016.
- Automated computation of the muon decay at NLO  
Yannick Ulrich, Master thesis, July 2016.
- Characterization of silicon photomultiplier arrays in liquid xenon and development of dedicated read-out electronics  
Sandro D'Amato, Master thesis, July 2016.
- Measurement of Open Charm and Double Open Charm Production Cross Sections and Ratios in  $pp$  Collisions at  $\sqrt{s} = 2.76$  TeV with the LHCb Experiment  
Enzio Crivelli, Master thesis, June 2016.
- Alloying CdTe with Se, a possible route to improve CdTe solar cells  
Annina Spescha, Master thesis, June 2016.
- Electronic and Spatial Structures of Self-Assembled Diamondoid Monolayers  
Markus Baumgartner, Master thesis, June 2016.
- Development of an experimental setup for fluorescence lifetime imaging microscopy using time-correlated single photon counting technique  
Anna Pataki, Master thesis, May 2016.

### 20.3.3 Bachelor theses

- Maxwell-Demon experiment for a cyclic 8-box system  
Nicolas Kunz, Bachelor thesis, March 2017.
- Estimation of the Energy Gap of the Spin-1/2 Dimer Compound  $\text{Ba}_{(3-x)}\text{Sr}_{(x)}\text{Cr}_2\text{O}_8$  from Heat Capacity Measurements  
Michele Masseroni, Bachelor thesis, March 2017.
- Blind Deconvolution of Fluorescence Microscopy Images  
Nicholas LeBow, Bachelor thesis, March 2017.

- Doping Graphene on SiO<sub>2</sub> using X-rays  
Björn Salzmann, Bachelor thesis, February 2017.
- Characterization of the NaI(Tl) detectors for radioactive decay rate modulation search experiment  
Magnus Gienal, Bachelor thesis, February 2017.
- Preparation and Characterization of (Co)Pyr/TiO<sub>2</sub>(110) for a Synchrotron Beamtime  
Karin von Arx, Bachelor thesis, December 2016.
- Testing of the Readout Chain and Data Acquisition of the CMS Pixel Upgrade Detector System  
Benno Neuenschwander, Bachelor thesis, December 2016.
- Electronic Level-Alignment and Band-Bending Effects in a Cobalt-Pyrphyrin/Cu<sub>2</sub>O(111) Heterojunction for a Photocatalytic Water Reduction Cathode  
Oliver Shah, Bachelor thesis, September 2016.
- Herstellung möglichst perfekter Kupferfilme für Graphen-Wachstum und Untersuchung des Einflusses von Annealing auf deren Oberflächenstruktur  
Laura Stucki, Bachelor thesis, September 2016.
- Aufbau eines Raman-Spektrometers zur Charakterisierung von Graphen  
Hubert Nussbaumer, Bachelor thesis, August 2016.
- Feasibility studies of  $B \rightarrow K^* \tau \tau$  decay  
Alexander Dätwyler, Bachelor thesis, July 2016.
- Orbital Selective Mott Physics in Ca<sub>2</sub>RuO<sub>4</sub> - An angle resolved photo emission study  
Fabio Cossalter, Bachelor thesis, July 2016.
- Aufbau eines Demonstrationsexperiments zum Photoeffekt  
Till Stöckli, Bachelor thesis, July 2016.
- Construction and Characterization of a Doubochinski Pendulum  
Tranquillo Janisch, Bachelor thesis, July 2016.

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