3rd Annual Meeting of the GRK 2044

04. - 06. October 2017

Hotel Stadt Breisach, Breisach a. K.

UNI FREIBURG

DFG Deutsche Forschungsgemeinschaft

Masse und Symmetrien nach der
GRK 2044
Entdeckung des Higgs-Teilchens am LHC

Wednesday, October 4th

09.30 - 10.15	Arrival and Coffee

10.15 -12.00	**Laura Covi: Baryogenesis Part I** *Baryogenesis is still one of the open questions in particle cosmology. In these lectures we will review the basic ingredients of any baryogenesis model, in particular the connection to CP violation and then discuss a few of the most popular mechanisms that can produce the baryonic asymmetry and how they can be implemented in BSM physics.*

12.00 - 14.00	Lunch break

14.00 - 14.30	**Veronika Magerl** *Searching for (short and long-lived) gluino signatures in hadronic final states*
14.30 - 15.00	**Vasiliy Sotnikov** *NLO QCD Corrections to Associated Production of W-bosons and b jets with Generalized Unitarity*
15.00 - 15.30	**Thorwald Klapdor-Kleingrothaus** *Micromegas Detectors: Studies on Effects of Humidity on the Gas Gain*
15.30 - 16.00	**Michele Boggia** *NLO corrections to $h \rightarrow WW/ZZ \rightarrow 4$ fermions in a Singlet Extension of the Standard Model*

16.00 - 16.30	Coffee break

16.30 - 18.15	**Rüdiger Schmidt - Introduction to accelerator physics and technology: The Large Hadron Collider Part I** *During the last decades experiments at accelerators were essential for the understanding of particle physics. To discover particles with very high mass, accelerators provided collisions between two high energy beams. The most recent proton-proton collider, the Large Hadron Collider (LHC) at CERN operates since 2008/2009. Initially the LHC was operating at 3.5 TeV, and today at 6.5 TeV (corresponding to 13 TeV centre-of-mass energy).*

The presentation introduces the concepts of accelerator physics and technology. The focus is on LHC, the challenges and the operational experience with this machine are presented. To achieve the proton momentum of up to 7 TeV/c and to provide high luminosity requires a very complex accelerator with superconducting magnets and high intensity beams. The energy stored in each of the two beams is beyond 300 MJ. With these parameters, operation enters into a regime where various effects due to high intensity bunches are observed (risk of beam induced damage, instabilities, beam-beam effects, e-cloud effects, UFOs). Safe and reliable operation in presence of such high intensity proton beams is guaranteed by the interplay of many different systems: beam dumping system, beam interlocks, beam instrumentation, equipment monitoring, collimators and absorbers.

The luminosity upgrade project for the LHC aims at an increase of the integrated luminosity by about a factor of 10. The construction of the "HiLumi" HL-LHC project should be completed by 2025, and HL-LHC will operate for at least 10 more years. Options for a high energy collider beyond the LHC, either e+e- or pp machine are also briefly discussed.

18.30 - 20.00	Dinner
20.00 - open end	Meeting of the PhD-students /Meeting of the faculty members

Thursday, October 5th

07.00 - 08.45	Breakfast

08.45 - 10.30	**Laura Covi: Baryogenesis Part II**

10.30 - 11.00	Coffee break

11.00 - 11.30	**Dirk Sammel** *Test of CP Invariance of the Higgs boson in Vector Boson Fusion production using the Optimal Observable method in the decay $H \rightarrow \tau\tau$*
11.30 - 12.00	**Philipp Mogg** *Searching for Top Squarks in Events with Boosted Hadronic Top Quarks with ATLAS at 13 TeV*

12.00 - 14.00	Lunch break

14.00 - 15.45	**Joachim Kopp - Neutrino Phyiscs Part I** *An era of discoveries has turned neutrino physics from a fringe topic into a centerpiece of the experimental particle physics program in many countries worldwide. In this lecture, we will discuss some of the theoretical and phenomenological foundations of this relatively young field. In particular, we will address neutrino oscillations (including the associated quantum mechanical subtleties), models explaining the smallness of neutrino masses, and connections between neutrinos and the hunt for new physics beyond the Standard Model.*

16.00 - 20.00	**Social event**

20.00 - 21.30	Dinner

Friday, October 6th

07.00 - 08.45	Breakfast
08.45 - 10.30	**Joachim Kopp - Neutrino Physics Part II**
10.30 - 12.30	**Poster Session with accompanying coffee break**
12.30 - 14.00	Lunch
14.00 - 15.45	**Rüdiger Schmidt - Introduction to accelerator physics and technology: The Large Hadron Collider Part II**
15.45 -16.15	Coffee break
16.15 - 16.45	**Peter Tornambè** *Searches and upgrade studies for Supersymmetry in final states with leptons, jets and missing transverse energy with the Atlas detector*
16.45 - 17.15	**Ralf Gugel** *Track-to-Calorimeter-Cell matching ambiguities during electron reconstruction in ATLAS*
17.15 - 17.40	**Discussion forum for Doctoral Researchers and Faculty members & Concluding Remarks**
18.00	**Departure**

Postersession on Friday, October 6th from 10.30 - 12.30

1.	Giulia Gonella	*Study of electroweak pp → W ± W ± jj process and its experimental challenges*
2.	Alena Lösle	*Test of CP Invariance in vector-boson fusion production of the Higgs boson in ditau full-leptonic decays at √s=13 TeV with the ATLAS detector*
3.	Sven Mägdefessel	*Cold IV Measurements at 3D-Sensors*
4.	Katharina Schleicher	*Search for lepton-flavour violating decays of the Higgs-Boson with the ATLAS detector*
5.	Théo Megy	*Tau identification and search for SM H → $_{\tau\tau}$ with ATLAS*
6.	Martin Rotzinger	*Higgs Phenomenology – An Effective Field Theory Approach*
7.	Matthijs van der Wild	*The Wheeler-DeWitt equation of scalar-tensor theories*
8.	Fabio Cardillo	*SUSY searches at √s = 13 TeV with two same-sign leptons or three leptons, jets and missing energy with the ATLAS detector - Background estimation and latest analysis results*
9.	Cedric Hönig	*NitroStrip*
10.	Jerry Dormans	*Higher-order QCD corrections based on N-jettiness for precision physics at the LHC*
11.	Julian Wollrath	*Alignment of the ATLAS Inner Detector*
12.	Evgenij Pascual	*Two-loop amplitudes from D-dimensional unitarity for LHC precision physics*
13.	Simone Curcio	*Trigger validation studies for ATLAS SUSY searches*
14.	Simona Gargiulo	*Modelling of the W+jets background in the VHbb analysis*