2019 COST Action CA15213 THOR Annual Meeting

Report of Contributions

https://indico.global/e/7023

Contribution ID: **5** Type: **not specified**

Chiral transport in strong fields from holography

Monday 2 September 2019 12:20 (40 minutes)

Anomaly-induced transport phenomena in presence of strong external electromagnetic fields are explored within a 4D field theory defined holographically as U(1)V×U(1)A Maxwell-Chern-Simons theory in Schwarzschild-AdS5. Two complementary studies are reported. In the first one, we present results on the Ohmic conductivity, diffusion constant, chiral magnetic conductivity, and additional anomaly-induced transport coefficients as functions of external e/m fields. Next, gradient resummation in a constant background magnetic field is performed. All-order resummed constitutive relations are parameterised by four momenta-dependent transport coefficient functions (TCFs). A highlight of this part is a thorough study of {\it non-dissipative} chiral magnetic waves (CMW) in strong magnetic fields. (reference-doi: 10.1007/JHEP05(2019)071)

Authors: Prof. LUBLINSKY, Michael; Prof. BU, Yanyan (Harbin Institute of Technology)

Presenter: Dr DEMIRCIK, Tuna (Ben-Gurion University of the Negev)

Contribution ID: **6** Type: **not specified**

Chiral Symmetry Restoration, patterns and partners within the QCD phase diagram

Friday 6 September 2019 10:30 (40 minutes)

I will review several aspects of the QCD phase diagram, paying special attention to the interplay between chiral and $U(1)_A$ restoration, exploring partner degeneration and patterns of symmetry breaking. I will show that the use of Ward Identities (WI) allows to shed light on this issue, being also a fruitful tool for the understanding of thermal observables. In addition, effective chiral lagrangians provide a model-independent realization of these ideas. In fact, a simple meson gas description might be already a good approximation for certain observables. Thus, Chiral Perturbation Theory (ChPT) scattering amplitudes combined with unitarization generate a thermal $f_0(500)$ state which saturates the scalar susceptibility in accordance with the lattice. On the other hand, a $U(3)$ ChPT-based analysis of the topological susceptibility reveals interesting aspects of the role of the η' state and the connection with chiral and $U_A(1)$ restoration through WI.

Authors: Prof. GOMEZ NICOLA, Angel (Universidad Complutense Madrid); Dr RUIZ DE ELVIRA, Jacobo (ITP, University of Bern); VIOQUE RODRÍGUEZ, ANDREA

Presenter: Prof. GOMEZ NICOLA, Angel (Universidad Complutense Madrid)

Contribution ID: **7** Type: **not specified**

Net-baryon fluctuations in Magnetized QCD matter

Tuesday 3 September 2019 16:20 (40 minutes)

The kurtosis and skewness of net baryon-number fluctuations are studied for the magnetized phase diagram of three-flavor quark matter within the Polyakov extended Nambu–Jona-Lasinio model. The effect of magnetic catalysis and inverse magnetic catalysis is considered using two distinct scalar interactions. Special attention is given to the fluctuations dependence near the critical end points (CEPs). Regions with large fluctuations but no CEP in non-magnetized matter develop a CEP under the action of a strong magnetic field.

Author: FERREIRA, Márcio

Presenter: FERREIRA, Márcio

Contribution ID: **9** Type: **not specified**

Double ratio method for the binding energies of hypernuclei in nuclear reactions

Monday 2 September 2019 10:30 (40 minutes)

Presenter: BUYUKCIZMECI, Nihal (Selcuk University)

Contribution ID: **10** Type: **not specified**

Production mechanisms for nuclear and hyper-nuclear clusters in relativistic ion collisions

Monday 2 September 2019 09:50 (40 minutes)

Presenter: BOTVINA, Alexander (FIAS, University of Frankfurt am Main)

Contribution ID: **11** Type: **not specified**

Opening remarks

Monday 2 September 2019 09:40 (10 minutes)

Contribution ID: **12** Type: **not specified**

Progress in chiral thermodynamics

Monday 2 September 2019 11:40 (40 minutes)

Presenter: SASAKI, Chihiro

Contribution ID: **13** Type: **not specified**

Heavy Quarks in Medium

Monday 2 September 2019 14:30 (40 minutes)

Presenter: ESCOBEDO ESPINOSA, Miguel Ángel (Instituto Galego de Física de Altas Enerxías)

Contribution ID: **14** Type: **not specified**

Partial wave analysis as a tool in baryon spectroscopy

Wednesday 4 September 2019 17:00 (40 minutes)

Presenter: HADZIMEHMEDOVIC, Mirza (University of Tuzla)

Contribution ID: **15** Type: **not specified**

Latest results on constraining the initial stages of heavy-ion collisions with high-pt data

Monday 2 September 2019 16:20 (40 minutes)

Presenter: Dr ILIC (BLAGOJEVIC), Bojana (Institute of Physics Belgrade)

Contribution ID: **16** Type: **not specified**

Recent results with full DREENA framework as a multipurpose tool for QGP tomography

Monday 2 September 2019 17:00 (40 minutes)

Presenter: ZIGIC, Dusan (Institute of Physics Belgrade)

Contribution ID: **17** Type: **not specified**

PNJL EOS at finite density and temperature

Tuesday 3 September 2019 09:50 (40 minutes)

Presenter: AICHELIN, joerg (Subatech/CNRS)

Contribution ID: **19** Type: **not specified**

Dynamical description of partonic phase at finite chemical potential

Tuesday 3 September 2019 11:40 (40 minutes)

Presenter: BRATKOVSKAYA, Elena (GSI, Darmstadt)

Contribution ID: **20** Type: **not specified**

Weak Interaction Data for Presupernova Evolution of Massive Stars

Tuesday 3 September 2019 12:20 (40 minutes)

Presenter: Prof. UN NABI , Jameel (GIK Institute of Engineering Sciences&Technology, Pakistan)

Contribution ID: **21** Type: **not specified**

Domain wall networks as QCD vacuum

Tuesday 3 September 2019 14:30 (40 minutes)

An approach to QCD vacuum as a medium describable in terms of statistical ensemble of almost everywhere homogeneous Abelian (anti-)self-dual gluon field is briefly reviewed. These fields can be seen as the confining medium for color charged fields as well as underline the specific realization of chiral $SU_{\rm L}(N_f) \times SU_{\rm R}(N_f)$ and $U_A(1)$ symmetries. The long-range fluctuations of topological charge density play important role both for confinement and chiral symmetry breaking.

Hadronization formalism based on this ensemble leads to manifestly defined quantum effective action for colorless hadrons. Strong, electromagnetic and weak interactions of mesons are represented in the action in terms of nonlocal n-point interaction vertices given by the quark-gluon loops averaged over the background ensemble. Systematic results for the mass spectrum and decay constants of radially excited light, heavy-light mesons and heavy quarkonia as well as electromagnetic form factors are presented. Interrelations between the present mean field type approach and the results of functional renormalization group and DSE results are discussed.

Peculiarities of the approach in description of deconfinement and chiral symmetry restoration under extreme conditions (strong electromagnetic fields, high energy and baryon densities) are outlined.

[1] S.N. Nedelko and V.E Voronin, arXiv:1906.00432 [hep-ph] (2019).
[2] S.N. Nedelko and V.E Voronin, Phys.Rev.D 95, 074038 (2017)
[3] S.N. Nedelko and V.E Voronin, Phys.Rev.D 93, 094010 (2016)
[4] S.N. Nedelko and V.˜E.˜Voronin, Eur.Phys.J. A 51, 45 (2015)
[5] B.V. Galilo and S.N. Nedelko, Phys.Rev. D 84, 094017 (2011)

Presenter: NEDELKO, Sergei (Joint Institute for Nuclear Research, BLTP)

Contribution ID: **22** Type: **not specified**

Jets n small systems

Tuesday 3 September 2019 15:10 (40 minutes)

Presenter: Prof. GERGERLY GABOR , Barnafoldi (Wigner RCP Hungarian Academy of Sciences Hungary)

Contribution ID: **23** Type: **not specified**

Observables of the nonequilibrium phase

Tuesday 3 September 2019 10:30 (40 minutes)

Presenter: TOMASIK, Boris (Univerzita Mateja Bela)

Contribution ID: **24** Type: **not specified**

Hadrons masses at high Tc

Friday 6 September 2019 09:50 (40 minutes)

Jon-Ivar Skullerud

Presenter: Prof. SKULLERUD , Jon-Ivar ((National University of Ireland Maynooth, Ireland)

Contribution ID: **25** Type: **not specified**

Finite density QCD

Friday 6 September 2019 11:40 (40 minutes)

Presenter: PHILIPSEN, Owe (Goethe-University Frankfurt)

Contribution ID: **26** Type: **not specified**

General discussion-Closing remarks

Friday 6 September 2019 13:00 (10 minutes)

Contribution ID: **27** Type: **not specified**

Emergence of hydrodynamical behaviour in the Quark Gluon Plasma

Wednesday 4 September 2019 09:50 (40 minutes)

Presenter: Prof. BLAIZOT, Jean-Paul (IPhT, France)

Contribution ID: **28** Type: **not specified**

The phases of QCD and holography

Wednesday 4 September 2019 10:30 (40 minutes)

Presenter: JARVINEN, Matti (Utrecht University)

Contribution ID: **29** Type: **not specified**

T-dependence of the axion mass from the tied chiral and U_A(1) symmetry restoration

Wednesday 4 September 2019 11:40 (40 minutes)

Presenter: KLABUCAR, Dubravko (University of Zagreb)

Contribution ID: **30** Type: **not specified**

Eta prime in the QGP

Wednesday 4 September 2019 12:20 (40 minutes)

Maria Paola Lombardo (INFN, Italy)
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Presenter: LOMBARDO, Maria Paola (INFN)

Contribution ID: **31** Type: **not specified**

Broken boost invariance in 3+1D Glasma simulations

Monday 2 September 2019 15:10 (40 minutes)

Presenter: IPP, Andreas (TU Wien)

Contribution ID: **32** Type: **not specified**

Jet energy loss and jet overlap in heavy ion collisions

Wednesday 4 September 2019 14:30 (40 minutes)

Presenter: Prof. KARPENKO, Iiuri (SUBATECH Nantes, France)

Contribution ID: **33** Type: **not specified**

Entanglement Entropy in High Energy Collisions

Wednesday 4 September 2019 15:10 (40 minutes)

Presenter: LUBLINSKY, Michael

Contribution ID: **34** Type: **not specified**

Light-front approach to quarkonia production

Wednesday 4 September 2019 16:20 (40 minutes)

Presenter: PASECHNIK, Roman (Lund university)

Contribution ID: **35** Type: **not specified**

Management Committee Meeting

Thursday 5 September 2019 09:00 (2h 15m)

Presenter: BLEICHER, Marcus (Uni Frankfurt)

Contribution ID: **36** Type: **not specified**

Management Committee Meeting

Thursday 5 September 2019 11:45 (2h 15m)

Presenter: TOMASIK, Boris (Univerzita Mateja Bela)

Contribution ID: **37** Type: **not specified**

Discussion- White paper

Thursday 5 September 2019 15:10 (40 minutes)

Contribution ID: **38** Type: **not specified**

Dense nuclear and quark matter from holography

Thursday 5 September 2019 16:20 (40 minutes)

There are currently no first-principle calculations for QCD at large, but not asymptotically large, baryon densities. For instance, we do not know at which densities there is a transition from nuclear matter to deconfined quark matter and what the nature of this transition is. I will discuss a holographic approach, using the Sakai-Sugimoto model, in which nuclear matter and quark matter are treated consistently on the same footing. In particular, baryons are described as instantons in the bulk and I will explain an approximation that takes into account instanton interactions. The results show that nuclear and quark matter can be connected continuously, and thus the model can be used to study a potential quark-hadron continuity at densities relevant for the cores of neutron stars.

Presenter: SCHMITT, Andreas (University of Southampton)

Contribution ID: **39** Type: **not specified**

Testing photon and dilepton rates in thermal QCD

Thursday 5 September 2019 17:00 (40 minutes)

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Presenter: LAINE, Mikko Sakari (Universitaet Bern (CH))

Contribution ID: **42** Type: **not specified**

The spatial sub-separation of strangeness from anti-strangeness in RHICs

Tuesday 3 September 2019 17:00 (40 minutes)

Presenter: BRAVINA, Larissa

Contribution ID: **43** Type: **not specified**

Collective dynamics in small systems

Friday 6 September 2019 12:20 (40 minutes)

Presenter: BOZEK, Piotr (AGH University of Science and Technology)