

Holographic perspectives on chiral transport

Report of Contributions

Contribution ID: 1

Type: **not specified**

Electric Conductivity and Chiral Anomaly - perturbative and holographic perspectives

Monday, 13 March 2023 14:10 (20 minutes)

In this talk, I would like to discuss the calculations of electric conductivity under a strong magnetic field. When the coupling constant is small enough, the perturbative approach should be useful, but the resummation is indispensable for the electric conductivity. I will explicate some technical details and investigate the subtle point in connection to the chiral anomaly. That is, it is necessary to treat the chirality as a hydrodynamical mode to incorporate the chiral anomaly, which requires nontrivial extensions. In contrast, in the holographic approach, the coupling to the chiral anomaly appears more explicit, and I will present the demonstration of the concrete calculation using the Sakai-Sugimoto model in a simple setup of the probe approximation which corresponds to the quenched approximation. However, even though the Sakai-Sugimoto model has desirable properties with respect to chiral symmetry, it is problematic that the model has only massless flavors. Chiral quarks make the electric conductivity diverge. Thanks to the fact that the contribution from the chiral anomaly looks explicit in the Sakai-Sugimoto model, the divergence associated with the chiral anomaly is reasonably identified. Then, it is possible to subtract the anomaly-induced divergence and estimate the finite part of the electric conductivity that corresponds to the Ohmic conductivity. The magnetic field dependence in the Ohmic conductivity turned out to be nontrivial. Consistency with the perturbative approach is still an open question.

Presenter: FUKUSHIMA, Kenji (The University of Tokyo)

Session Classification: New perspectives on chiral transport

Contribution ID: 2

Type: **not specified**

Collective axions in chiral media: an effective field theory approach

Monday, 13 March 2023 14:30 (20 minutes)

The IR pole of the anomalous triangle diagram indicates that a system of massless fermions may support a collective pseudoscalar mode. At finite axial density, this mode controls the low-energy dynamics of the system and becomes the sound wave of the anomalous hydrodynamics. In this talk, I will discuss how this mode is affected by fermionic interactions, and show that the low-energy dynamics is sufficiently universal, depending only on the equation of state. The resulting EFT describes a collective axionic mode in a variety of systems of massless fermions. I will also briefly touch the potential phenomenological implications for Weyl and Dirac semimetals.

Presenter: SADOBYEV, Andrey (IGFAE)

Session Classification: New perspectives on chiral transport

Contribution ID: 3

Type: **not specified**

Discussion

Monday, 13 March 2023 14:50 (20 minutes)

Session Classification: New perspectives on chiral transport

Contribution ID: 4

Type: **not specified**

The butterfly effect in a holographic chiral system

Monday, 13 March 2023 16:00 (20 minutes)

Chaotic behavior in a holographic system is related to energy dynamics. If the system is also chiral, energy can be transported through the chiral magnetic effect. This may indicate that there is a relationship between chaos and chiral transport in such systems. We explore this idea by studying the butterfly effect in a holographic chiral system in the presence of a magnetic field.

Presenter: ABBASI, Navid

Session Classification: Holography for chiral effects - I

Contribution ID: 5

Type: **not specified**

Thermodynamics and hydrodynamics in the holographic Stückelberg model

Monday, 13 March 2023 15:40 (20 minutes)

We study the thermodynamics and the anomalous transport properties of a massive U(1) gauge holographic model in 5 dimensions with pure gauge and mixed gauge-gravitational Chern-Simons terms]. The thermodynamics is studied by considering an expansion in the conformal dimension of the current associated to the gauge field, and the transport is studied by using Kubo formulae. This study is done by including the full backreaction of the gauge field on the metric tensor, which has allowed us to explore, in addition to the chiral magnetic conductivity, the vortical and energy transport sector in the anomalous conductivities. We find that all the correlators depend on the mass of the gauge field, and some correlators which are completely absent in the massless case, get a non-vanishing value in the massive theory.

Presenter: MEGIAS, Eugenio (University of Granada)

Session Classification: Holography for chiral effects - I

Contribution ID: 6

Type: **not specified**

Discussion

Monday, 13 March 2023 16:20 (20 minutes)

Session Classification: Holography for chiral effects - I

Contribution ID: 7

Type: **not specified**

Searching for the Chiral Magnetic Effect with ALICE

Tuesday, 14 March 2023 10:00 (40 minutes)

Presenter: DOBRIN, Alexandru (Institute of Space Science (RO))

Session Classification: Chiral magnetic effect & Experiments

Contribution ID: 8

Type: **not specified**

Discussion

Tuesday, 14 March 2023 10:40 (20 minutes)

Session Classification: Chiral magnetic effect & Experiments

Contribution ID: 9

Type: **not specified**

Studying quark anti-quark pairs in the initial state as a background for the CME

Tuesday, 14 March 2023 11:30 (20 minutes)

Due to gluon splittings into quark anti-quark pairs, initial fluctuations in baryon (B), strangeness (S), and electric charge (Q) are possible in a high-energy initial condition for the Quark Gluon Plasma. We assume that the initial condition given by

TRENTO provides the gluon distribution and then we convert that into BSQ charge fluctuations using the newly developed ICCING code that incorporates these gluon splittings. These new initial conditions are ran into a relativistic viscous hydrodynamic code that conserves BSQ to study the consequence of charge fluctuations on the final state. Using this framework we quantify charge fluctuations that may affect the chiral magnetic effect

observables at RHIC and the LHC.

Presenter: NORONHA-HOSTLER, Jacquelyn (University of Illinois Urbana-Champaign)

Session Classification: Quarks and baryons in QGP and neutron stars

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

Baryons in the V-QCD holographic model

Tuesday, 14 March 2023 11:50 (20 minutes)

Baryons in holography arise as bulk instantons of the flavor gauge fields. In this talk I will discuss how these solutions are obtained in the class of models called V-QCD (a phenomenological holographic model for QCD in the Veneziano limit). I will discuss the role of Chern-Simons terms, how bulk instanton number is related to boundary baryon charge once suitable regularity conditions are imposed, and I will present numerical solutions in a concrete model.

Presenter: NITTI, Francesco (APC, Université Paris Cité)

Session Classification: Quarks and baryons in QGP and neutron stars

Contribution ID: **11**

Type: **not specified**

Discussion

Tuesday, 14 March 2023 12:10 (20 minutes)

Session Classification: Quarks and baryons in QGP and neutron stars

Contribution ID: 12

Type: **not specified**

Transport of unpaired quark matter in neutron star densities

Tuesday, 14 March 2023 14:00 (20 minutes)

Presenter: JOKELA, Niko (Helsinki Institute of Physics)

Session Classification: Neutron stars I

Contribution ID: 13

Type: **not specified**

Holographic analysis of Quasinormal modes at large density in QCD

Tuesday, 14 March 2023 14:20 (20 minutes)

The difficulty of describing the phase diagram of QCD at low temperatures and high-density regime has been tackled by the AdS/CFT correspondence by several models. Here we propose a study of the phase diagram based in the non-perturbative V-QCD model, in which the agreement at low density is made by taking input from lattice field theory results. We calculate the fluctuation equations for the helicity 0, 1 and 2 sectors and locate the quasinormal modes to see whether an instability related with the bulk AdS 2 geometry dual to the very low temperature regime is present. We are motivated for the fact that it is known that such AdS 2 solutions are highly unstable as AdS 2 has a rather restrictive BF bound.

Presenter: CRUZ, Jesus (APCTP)

Session Classification: Neutron stars I

Contribution ID: 14

Type: **not specified**

Discussion

Tuesday, 14 March 2023 14:40 (20 minutes)

Session Classification: Neutron stars I

Contribution ID: 15

Type: **not specified**

A new formulation of strong-field magnetohydrodynamics for neutron stars

Tuesday, 14 March 2023 15:30 (20 minutes)

I will discuss our recent formulation of magnetohydrodynamics (MHD) which can be used to describe the evolution of strong magnetic fields in neutron star interiors. The approach is based on viewing MHD as a theory with a one-form global symmetry and developing an effective field theory for the hydrodynamic modes associated with this symmetry. In the regime where the local velocity and temperature variations can be neglected, I will derive the most general constitutive relation for the electric field in the presence of a strong magnetic field. This constitutive relation not only reproduces the phenomena of Ohmic decay, ambipolar diffusion, and Hall drift derived in a phenomenological model by Goldreich and Reisenegger, but also reveals new terms in the evolution of the magnetic field which cannot easily be seen from such microscopic models. Our new formulation gives predictions for novel diffusive phenomena and for the two-point correlation functions among various components of the electric and magnetic fields. At the end of my talk, I will comment on various future directions and open problems, which will include the study of chiral effects in magnetised plasmas.

Presenter: GROZDANOV, Sašo (University of Edinburgh and University of Ljubljana)

Session Classification: Neutron stars II

Contribution ID: 16

Type: **not specified**

Dense and Hot QCD at Strong Coupling and Neutron Star Phenomenology

Tuesday, 14 March 2023 15:50 (20 minutes)

Solving Quantum Chromodynamics (QCD) at intermediate density and temperature is a long-standing open problem. Since the traditional methods don't work in this region, even the precise phase structure of QCD is currently not known. The hot and dense part of the QCD phase diagram is probed in binary neutron star mergers. It is also conjectured to include a critical end point of the nuclear to quark matter transition whose location in the phase diagram will be narrowed down by upcoming heavy-ion experiments. The subject of the talk is the recently developed novel framework for the equation of state (EoS) of dense and hot QCD. This framework bridges the gap in theoretical predictions at intermediate densities by using the gauge/gravity duality, which maps the strongly coupled QCD to classical higher dimensional gravity. The model combines predictions from the gauge/gravity duality with input from lattice field theory, QCD perturbation theory and traditional nuclear theory methods. I will focus the recent results of this approach (i.e. the state-of-art QCD-EoSs, predictions for QCD phase diagram, QCD critical end point, applications to static, spinning neutron stars and neutron star mergers)

Presenter: DEMIRCIK, Tuna (Wroclaw University of Science and Technology)

Session Classification: Neutron stars II

Contribution ID: 17

Type: **not specified**

A dynamical inflaton coupled to strongly interacting matter

Tuesday, 14 March 2023 16:10 (20 minutes)

In talk I will show how to self-consistently couple the Einstein-inflaton equations to a strongly coupled quantum field theory (QFT) as described by holography. We show that this can lead to an inflating universe, a reheating phase and finally a universe dominated by the QFT in thermal equilibrium. Special attention will be given to technical details that could be of relevance for modelling of more general holographic set-ups that for instance include charge

Presenter: VAN DER SCHEE, Wilke (CERN)

Session Classification: Neutron stars II

Contribution ID: 18

Type: **not specified**

Non-invertible axial symmetries and Goldstone modes

Wednesday, 15 March 2023 10:00 (20 minutes)

Recent work has shown us a new way to think about systems with an Adler-Bell-Jackiw anomaly, such as QED: they admit a continuous global non-invertible symmetry, an example of a concept which has received much recent attention in the formal field theory literature. I will briefly review this story in an elementary way and present a new kind of non-invertible charge operator where a key role is played by a current operator localized on the charge defect. I'll show that this construction lets us prove an analogue of Goldstone's theorem for such systems.

Presenter: IQBAL, Nabil (Durham University)

Session Classification: Holography for chiral effects - II

Contribution ID: 19

Type: **not specified**

Chiral magnetohydrodynamics, Holography and EFT

Wednesday, 15 March 2023 10:20 (20 minutes)

In this talk, we will discuss QED at finite temperature from a hydrodynamic viewpoint. In the first part of the talk, we will discuss a holographic model which has the same 1-form symmetry structure as that of QED. In the second part of the talk, we will discuss an effective field theory which will be in the same universality class as that of QED at finite temperature. We shall also briefly touch upon how this EFT would lead to known QED phenomenology.

Presenter: DAS, Arpit (Durham University)

Session Classification: Holography for chiral effects - II

Contribution ID: **20**

Type: **not specified**

Discussion

Wednesday, 15 March 2023 10:40 (20 minutes)

Session Classification: Holography for chiral effects - II

Contribution ID: 21

Type: **not specified**

Chiral Magnetic Effect with dynamical axial charge in holography

Wednesday, 15 March 2023 11:30 (20 minutes)

Previous real-time studies of the CME in holography have only dealt with chiral anomalies stemming from the coupling of the currents in the dual field theory to external (non-dynamical) gauge fields. These are introduced via Chern-Simons terms in the bulk description. We will here extend the results with the inclusion of a dynamical contribution to the anomaly, which in QCD arises from the dynamics of gluons. Its holographic realization is well known to be achieved by rendering the bulk gauge field massive. This will allow to study axial charge dissipation as well as to introduce charge generation by a proper choice of the initial state. We will present results for typical parameters of the collisions at RHIC at LHC which are relevant for the CME.

Presenter: MORALES TEJERA, Sergio

Session Classification: Holography for chiral effects - III

Contribution ID: 22

Type: **not specified**

TBA

Wednesday, 15 March 2023 11:50 (20 minutes)

Presenter: GRIENINGER, Sebastian

Session Classification: Holography for chiral effects - III

Contribution ID: 23

Type: **not specified**

Discussion

Wednesday, 15 March 2023 12:10 (20 minutes)

Session Classification: Holography for chiral effects - III

Contribution ID: 24

Type: **not specified**

A causal and stable theory of chiral hydrodynamics

Wednesday, 15 March 2023 14:00 (20 minutes)

Chirally anomalous matter is expected to exhibit novel transport phenomena arising from the interplay between quantum anomalies and electromagnetic and vortical fields. In order to study these effects in the quark-gluon plasma formed in heavy-ion collisions, it is important to develop a theory of chiral hydrodynamics which captures the anomaly and includes dissipative effects in a consistent manner as previous formulations suffer from acausality, instability, and ill-posedness of the initial value problem. We show how such issues can be fixed by using a suitable definition of the hydrodynamic fields out of equilibrium, which provides a consistent theory that can be readily employed in numerical simulations

Presenter: Prof. NORONHA, Jorge (University of Illinois at Urbana-Champaign)

Session Classification: Chiral and Magneto Hydrodynamics - I

Contribution ID: 25

Type: **not specified**

Chiral hydrodynamics in strong magnetic fields

Wednesday, 15 March 2023 14:20 (20 minutes)

We review a hydrostatic generating functional formulation of chiral hydrodynamics with a strong magnetic field. We focus on a toy model for chiral hydrodynamics with a single anomalous symmetry, in the presence of a strong axial magnetic field as presented in <https://arxiv.org/abs/2012.09183>. Time permitting, we comment on how to extend this formalism to the hydrodynamics of a system with symmetry with strong axial and/or vector magnetic fields.

Presenter: HERNANDEZ, Juan (Vrije Universiteit Brussel)

Session Classification: Chiral and Magneto Hydrodynamics - I

Contribution ID: 26

Type: **not specified**

Discussion

Wednesday, 15 March 2023 14:40 (20 minutes)

Session Classification: Chiral and Magneto Hydrodynamics - I

Contribution ID: 27

Type: **not specified**

An example of the convergence of hydrodynamics in strong external fields

Wednesday, 15 March 2023 15:30 (20 minutes)

Hydrodynamics has been an extraordinarily useful tool in the analysis of heavy ion collisions. With a definitive signal of the chiral magnetic effect still not shown at RHIC, the community has been focused on understanding each step of the analysis in as much detail as is permitted, relaxing assumptions where necessary. Given the importance of hydrodynamic modeling it is crucially important to understand whether the strong magnetic fields experienced during a heavy ion collision do not disturb the use of the linearized hydrodynamic expansion. In this talk I will make use of the AdS/CFT correspondence to provide an example of how the convergence of the linearized hydrodynamic series changes in response to strong external fields. Working in asymptotically AdS₅ I construct fully backreacted magnetic black brane solutions whose holographic dual is N=4 SYM theory minimally coupled to a global U(1) gauge field. Using recent advances in the literature, I construct fluctuations on this background which correspond to the locations of critical points of hydrodynamic dispersion relations. Given no other obstructions, these points correspond to the radius of convergence of the linearized hydrodynamic expansion of a fluid in strong external magnetic fields.

Presenter: CARTWRIGHT, Casey (Utrecht University)

Session Classification: Chiral and Magneto Hydrodynamics - II

Contribution ID: 28

Type: **not specified**

Non-abelian Anomalous Hydrodynamics: A Dimensional Reduction Approach

Wednesday, 15 March 2023 15:50 (20 minutes)

We report on our progress in implementing a new proposal for anomalous non-Abelian relativistic hydrodynamics in four and two spacetime dimensions. Models with continuous non-Abelian symmetries are ubiquitous in physics, arising in diverse settings ranging from the quark-gluon plasma to cold atomic gases and quantum spin chains.

The approach consists on the Kaluza-Klein compactification of a six-dimensional non-dissipative neutral fluid with a pure gravitational anomaly on a manifold with a non-Abelian isometry. We obtain the constitutive relations of a four-dimensional anomalous fluid charged under non-Abelian background gauge fields and identify the anomalous transport coefficients in the resulting colored fluid. Interestingly, these coefficients are defined in terms of the anomaly coefficient of the higher dimensional fluid and the parameters of the compactification ansatz. In order to test the robustness of the approach, we find the constitutive relations for the non-Abelian currents and the stress-energy tensor of a two dimensional field theory, as two dimensions is particularly simple from the point of view of anomalies

Presenter: SAURA BASTIDA, Pablo (UPCT and IFT-UAM/CSIC)

Session Classification: Chiral and Magneto Hydrodynamics - II

Contribution ID: 29

Type: **not specified**

Discussion

Wednesday, 15 March 2023 16:10 (20 minutes)

Session Classification: Chiral and Magneto Hydrodynamics - II

Contribution ID: 30

Type: **not specified**

Exact form of currents at global equilibrium with rotation and acceleration for free massless fermions

Thursday, 16 March 2023 10:00 (20 minutes)

The exact form of the Wigner function of massless particles for the free Dirac field at general global thermodynamic equilibrium with rotation and acceleration can be obtained by means of an iterative solution for the two-point function in momentum space followed by a suitable analytic continuation. The latter requires a newly proposed operation on complex functions dubbed as analytic distillation. The obtained mean values of the stress-energy tensor, vector and axial currents for the massless Dirac field are in agreement with known analytic results in the special cases of pure acceleration and pure rotation. By using this approach, we obtain new expressions of the currents for the more general case of combined rotation and acceleration and, in the pure acceleration case, we demonstrate that they must vanish at the Unruh temperature. The significance of these results for a general derivation of the entropy current is addressed.

Presenter: BECATTINI, Francesco (Università & INFN Firenze)

Session Classification: Spin and near critical Hydrodynamics- I

Contribution ID: 31

Type: **not specified**

Spin hydrodynamics

Thursday, 16 March 2023 10:20 (20 minutes)

Several recent approaches to relativistic hydrodynamics of particles with spin will be shortly reviewed. A possible explanation of the (in)sensitivity of the obtained results to the so called pseudo-gauge transformation will be offered

Presenter: FLORKOWSKI, Wojciech (Jagiellonian University, Krakow, Poland)

Session Classification: Spin and near critical Hydrodynamics- I

Contribution ID: 32

Type: **not specified**

Discussion

Thursday, 16 March 2023 10:40 (20 minutes)

Session Classification: Spin and near critical Hydrodynamics- I

Contribution ID: 33

Type: **not specified**

Hydro+

Thursday, 16 March 2023 11:30 (20 minutes)

Presenter: STEPHANOV, Mikhail

Session Classification: Spin and near critical Hydrodynamics -II

Contribution ID: 34

Type: **not specified**

Approach to criticality in holographic plasmas

Thursday, 16 March 2023 11:50 (20 minutes)

I study critical behavior in a simple nonconformal holographic setting, i.e., for black holes in five dimensional Einstein-dilaton gravity, where criticality is obtained by choosing the potential of the dilaton field appropriately. In the critical limit the nonhydrodynamic modes can be solved analytically, become long-lived, and coalesce into a branch cut. This limit is one-to-one correspondence with the large D limit of Einstein's gravity which allows for an alternative interpretation of the results

Presenter: JARVINEN, Matti (APCTP, Pohang)

Session Classification: Spin and near critical Hydrodynamics -II

Contribution ID: 35

Type: **not specified**

Discussion

Thursday, 16 March 2023 12:10 (20 minutes)

Session Classification: Spin and near critical Hydrodynamics -II

Contribution ID: 36

Type: **not specified**

Hydrodynamics, spin currents, and torsion

Thursday, 16 March 2023 14:00 (20 minutes)

Presenter: YAROM, Amos (Technion)

Session Classification: Spin and near critical Hydrodynamics - III

Contribution ID: 37

Type: **not specified**

Pseudo-spontaneous Symmetry Breaking in Hydrodynamics and Holography

Thursday, 16 March 2023 14:20 (20 minutes)

We investigate the hydrodynamics of systems with pseudo-spontaneously broken $U(1)$ - symmetry and Goldstone phase relaxation. The proposed hydrodynamic framework capturing these, in principle independent, effects is tested within two concrete holographic models. We find agreement between the hydrodynamic dispersion relations and the quasi-normal modes of both holographic models. In case of an explicit $U(1)$ symmetry breaking we show the validity of a universal relation between the phase relaxation rate, the mass of the pseudo-Goldstone and the Goldstone diffusivity.

Presenter: AMMON, Martin (University of Jena)

Session Classification: Spin and near critical Hydrodynamics - III

Contribution ID: **38**

Type: **not specified**

Discussion

Thursday, 16 March 2023 14:40 (20 minutes)

Session Classification: Spin and near critical Hydrodynamics - III

Contribution ID: 39

Type: **not specified**

On conductivities in anomalous hydrodynamics

Thursday, 16 March 2023 15:30 (20 minutes)

In this talk I will review some recent results on conductivities in anomalous hydrodynamics. In particular, I will discuss our recent paper [2212.09761] which demonstrates that when the magnetic field is treated as order one in derivatives the gauge anomaly makes no contribution to the appropriately truncated low frequency conductivity. I will also argue that there is a preferential choice for the anomalous contributions to the constitutive relations which can be seen by treating the magnetic field as order zero in derivatives. Then I will discuss upcoming results on relaxation terms in relaxed or quasihydrodynamics and their relevance for anomalous transport.

Presenter: BRATTAN, Daniel (CPhT, Ecole Polytechnique)

Session Classification: EFT for chiral media

Contribution ID: 40

Type: **not specified**

Anomaly-induced transport regime in Weyl semimetals

Thursday, 16 March 2023 15:50 (20 minutes)

In conventional conductors, transport can be classified as diffusive, ballistic, or hydrodynamic, depending on the primary scattering mechanism of electrons. In this talk I will discuss the presence of a hitherto neglected transport regime in Weyl semimetals, related to the presence of chiral anomalies. In this regime the relation between the current and the electric field becomes nonlocal as a result of diffusion of the axial charge into the bulk of the material. We propose to use this novel regime as a diagnostic of the presence of chiral anomalies in optical conductivity measurements. These results are obtained from a generalized kinetic theory which includes various relaxation mechanisms, allowing us to investigate different transport regimes of Weyl semimetals.

Presenter: MATUS, Pawel (Max Planck Institute for the Physics of Complex Systems)

Session Classification: EFT for chiral media

Contribution ID: 41

Type: **not specified**

Discussion

Thursday, 16 March 2023 16:10 (20 minutes)

Session Classification: EFT for chiral media

Contribution ID: 42

Type: **not specified**

Non-Hermitian Holography

Friday, 17 March 2023 10:00 (20 minutes)

The formulation and study of non-Hermitian PT-symmetric quantum theories has been the focus of both theoretical and experimental activity in recent years. In this talk I will present a minimal gravity dual of a non-Hermitian QFT, discuss its main features, and hopefully open up a discussion on future non-Hermitian directions.

Presenter: AREAN FRAGA, Daniel

Session Classification: Non-Hermitian systems

Contribution ID: 43

Type: **not specified**

Chiral anomaly in effective open quantum systems

Friday, 17 March 2023 10:20 (20 minutes)

The chiral anomaly underlies various phenomena, including dissipationless transport currents in topological systems. While many investigations have explored the chiral anomaly in various closed topological systems, much less attention has been given to exploring this anomaly in open quantum systems. By employing the non-Hermitian description of open quantum systems in this talk, I will address whether there are anomalous conservation laws that remain unaccounted for. For this purpose, I will present a unified formulation to calculate anomalous responses in Hermitianized, anti-Hermitianized, and non-Hermitian systems of massless electrons with complex Fermi velocities coupled to non-Hermitian gauge fields. Using this formulation, I will show that the quantum conservation laws of chiral currents of non-Hermitian systems are not related to those in Hermitianized and anti-Hermitianized systems, as would be expected classically, due to novel anomalous terms that we derive. I will further present some physical consequences of our non-Hermitian anomaly that may have implications for a broad class of emerging experimental systems described by non-Hermitian Hamiltonians.

Presenter: SAYYAD, Sharareh (MPI for the Science of Light)

Session Classification: Non-Hermitian systems

Contribution ID: 44

Type: **not specified**

Discussion

Friday, 17 March 2023 10:40 (20 minutes)

Session Classification: Non-Hermitian systems

Contribution ID: 45

Type: **not specified**

Renormalization group for fractons

Friday, 17 March 2023 11:50 (20 minutes)

Fractons are excitations with mobility constraints that were proposed to constitute a novel phase of matter. Imprints of fractons were identified in the context of quantum error correction, elasticity and quantum Hall effect. Low energy dynamics of fracton theories presents itself with many exotic features and challenges. In order to have a detailed understanding of these phases it is useful to employ dualities. I will introduce a particle-vortex-like duality in the context of the plaquette-dimer height model with fractonic behavior. This model will be studied by means of the renormalization group approach. I will present a Berezinskii-Kosterlitz-Thouless transition of the fracton type that goes beyond known universality classes

Presenter: SURÓWKA, Piotr**Session Classification:** Fracton Hydrodynamics

Contribution ID: 46

Type: **not specified**

Fracton hydrodynamics

Friday, 17 March 2023 11:30 (20 minutes)

We will discuss how to construct a hydrodynamic theory compatible with the symmetries of dipole-conserving systems. After doing so, we will analyse the theory's hydrodynamic modes spectrum.

Presenter: PENA-BENITEZ, Francisco (Wroclaw University of Science and Technology)

Session Classification: Fracton Hydrodynamics

Contribution ID: 47

Type: **not specified**

Discussion

Friday, 17 March 2023 12:10 (20 minutes)

Session Classification: Fracton Hydrodynamics

Contribution ID: 48

Type: **not specified**

Discussion

Tuesday, 14 March 2023 16:30 (30 minutes)

Session Classification: Neutron stars II