Invisibles24 Workshop

Report of Contributions

https://agenda.infn.it/e/InvisiblesWorkshop24

Contribution ID: **1** Type: **not specified**

Constraining majoron from big bang nucleosynthesis

Majoron-like particle J in the mass range between 1MeV to 10 GeV, which dominantly decays into the standard model (SM) neutrinos, can be constrained from the big-bang nucleosynthesis (BBN). For majoron lifetime (τ_J) smaller than 1sec, the injected neutrinos from the majoron decay heat up the background plasma and it results in the deficit of Helium-4 abundance and enhancement of Deuterium (D) abundance. For τ_J larger than 1sec, the injected neutrinos enhance the conversion rate of $p \to n$ which results in the enhancement of Helium-4 and D abundance. We found that in both cases, the constraint from the measurement of D is the strongest. We also estimate the $\Delta N_{\rm eff}$ constraint on the majoron parameter space and compare it with the BBN bounds, obtained from our analysis.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: SHIN, Chang Sub (Chungnam National University); CHANG, Sanghyeon (Institute for Basic Science); GANGULY, Sougata (Chungnam National University); JUNG, Tae Hyun (Institute for Basic Science); PARK, Tae-Sun (Institute for Basic Science)

Presenter: GANGULY, Sougata (Chungnam National University)

Session Classification: Poster Session

Contribution ID: **3** Type: **not specified**

The Dark Hypercharge Symmetry

$U(1)$ extension of the Standard Model (SM) is well motivated, where the charges of SM fermions are fixed by gauge anomaly cancellations and Yukawa interactions. The scientific literature extensively covers the study of vector solutions in which SM fermions are vector-like under new $U(1)_X$ symmetry, allowing the Yukawa structure to remain invariant. On the other hand, chiral solutions in which SM fermions are chiral under new symmetry are not well explored. In this work, we venture into these relatively unexplored chiral solutions. We introduced a comprehensive set of chiral solutions for gauge anomaly cancellation, incorporating three right-handed fermions (RHFs) while preserving the SM Yukawa structure. Remarkably, these RHNs emerge as promising candidates for Dark Matter (DM). We will demonstrate in a model-independent manner using only the Z' interaction channel, that the lightest RHF, denoted as F_1, is a viable DM candidate, and it can meet all current DM constraints with a mass of M_{F_1}
$gtrsim150$ GeV.

Title of the Poster/Talk

The Dark Hypercharge Symmetry

Related Papers/Preprints

Primary authors: PRAJAPATI, Hemant Kumar (Indian Institute of Science Education and Research Bhopal); Dr SRIVASTAVA, Rahul (Indian Institute of Science Education and Research Bhopal)

Presenter: PRAJAPATI, Hemant Kumar (Indian Institute of Science Education and Research Bhopal)

Session Classification: Poster Session

Contribution ID: **4** Type: **not specified**

ALP contribution to the Strong CP problem

Tuesday, July 2, 2024 4:30 PM (5 minutes)

We compute the one-loop contribution to the $\bar{\theta}$-parameter of an axion-like particle (ALP) with CP-odd derivative couplings. Its contribution to the neutron electric dipole moment is shown to be orders of magnitude larger than that stemming from the one-loop ALP contributions to the up- and down-quark electric and chromoelectric dipolemoments. This strongly improves existing bounds on ALP-fermion CP-odd interactions, and also sets limits on previously unconstrained couplings. The case of a general singlet scalar is analyzed as well. In addition, we explore how the bounds are modified in the presence of a Peccei-Quinn symmetry.

Title of the Poster/Talk

Improved nEDM limits on ALP couplings to fermions

Related Papers/Preprints

2403.12133

Primary authors: GAVELA, Belen (Universidad Autónoma de Madrid); GRINSTEIN, Benjamin (University of California San Diego); Dr QUILEZ LASANTA, Pablo (University of California San Diego); ENGUITA-VILETA, Víctor (Instituto de Física Teórica (IFT UAM-CSIC))

Presenter: ENGUITA-VILETA, Víctor (Instituto de Física Teórica (IFT UAM-CSIC))

Session Classification: Young Scientist Forum

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

Cosmic-ray boosted dark matter confronted by constraints on new light mediators

Tuesday, July 2, 2024 12:40 PM (5 minutes)

Direct detection experiments lose sensitivity to light dark matter because of the small energy deposition in nuclear recoil events. Scenarios where dark matter is boosted to relativistic velocities thus provide a promising means to constrain sub-GeV dark matter particles. Cosmic-ray upscattering is a particularly appealing boosting mechanism as it does not require any assumptions beyond dark matter coupling to nucleons or electrons. However, observable signals are restricted to large cross sections which can only be realized with large couplings, light mediators or composite dark matter. Considering a general set of light mediators that couple dark matter to hadrons, we use data from Borexino, XENON1T, LZ and Super-K to show that existing constraints on such mediators exclude appreciable cosmic ray upscattering. This finding highlights the limited applicability of cosmic-ray upscattering and the importance of considering model dependence.

Title of the Poster/Talk

Cosmic-ray boosted dark matter confronted by constraints on new light mediators

Related Papers/Preprints

https://arxiv.org/abs/2309.11003

Primary authors: SHAUKAT ALI, Iman (ARC Centre of Excellence for Dark Matter Particle Physics, The University of Melbourne); Dr NEWSTEAD, Jayden (ARC Centre of Excellence for Dark Matter Particle Physics, The University of Melbourne); Prof. BELL, Nicole (ARC Centre of Excellence for Dark Matter Particle Physics, The University of Melbourne)

Presenter: SHAUKAT ALI, Iman (ARC Centre of Excellence for Dark Matter Particle Physics, The University of Melbourne)

Session Classification: Young Scientist Forum

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

Using the motion of galaxies to investigate the nature of dark matter

Two of the biggest mysteries of modern cosmology are the nature of dark matter and dark energy. One of the leading candidates for explaining these is a modified theory of gravity. In this talk, I will present an improved method of using the motion of galaxies (peculiar velocity) to measure the rate of growth of the Large-Scale Structure. The growth rate of the Large-Scale Structure (fσ_8) is indicative of the strength of gravity, which is different in different theories of gravity. We used one of the largest peculiar velocity catalogues to date –the SDSS peculiar velocity catalogue to obtain one of the tightest constraints on the growth rate of Large-Scale Structure. We found our constraints are consistent with the prediction of general relativity with cold dark matter. Future surveys such as 4MOST and DESI will provide an order of magnitude more measurements on peculiar velocities than the SDSS. I will also show a forecast of the constraint on the growth rate of the Large-Scale Structure with these future surveys.

Title of the Poster/Talk

Related Papers/Preprints

https://arxiv.org/abs/2209.04166

Primary author: LAI, Yan (The University of Queensland)

Presenter: LAI, Yan (The University of Queensland)

Session Classification: Poster Session

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

Tidal Disruption Events as Dark Matter Probe

Tidal Disruption Event (TDE) is an astrophysical event where stars are tidally disrupted as they pass near a black hole. This event results in a flux of high-energy neutrinos. IceCube data suggests the presence of these neutrinos in TDEs. The emitting region of neutrinos and photons is likely to be located near the central black hole, where the dark matter density may be significantly higher than in the outer regions of the galaxy. In this talk, we present the attenuation of emitted neutrino and photon fluxes due to interactions with dark matter particles surrounding supermassive black holes in the host galaxies of AT2019dsg, AT2019fdr, and AT2019aalc. The events have the potential to constrain the dark matter scattering cross-section by ensuring consistency with the observed flux. We also discuss the further applications and future directions of TDEs as a probe of dark matter.

Title of the Poster/Talk

Related Papers/Preprints

https://arxiv.org/abs/2312.11670

Primary authors: Dr FUJIWARA, Motoko (Technical University of Munich); Dr HERRERA, Gonzalo (Virginia Tech.)

Presenter: Dr FUJIWARA, Motoko (Technical University of Munich)

Session Classification: Poster Session

Contribution ID: **8** Type: **not specified**

Constraints on the Cosmic Neutrino Background from NGC1068

Monday, July 1, 2024 3:50 PM (5 minutes)

We investigate IceCube's ability to constrain the neutrino relic abundance using events from the recently identified neutrino source NGC1068. Since these neutrinos have large energies $gtrsim1$ TeV and have propagated through large distances, they make a great probe for overabundances of the cosmic neutrino background.

The propagation of neutrinos from NGC1068 was simulated by solving a transport equation, which takes into account the SM neutrino-neutrino interactions. The final fluxes produced are then analysed using publicly released IceCube data. Our preliminary results indicate that IceCube is able to improve the current bounds on a relic neutrino overabundance by 3 orders of magnitude compared to current experimental bounds, i.e. to less than ~ $10^9 \mathrm{cm}^{-3}$ at the 2σ confidence level.

Title of the Poster/Talk

Constraints on the Cosmic Neutrino Background from NGC1068

Related Papers/Preprints

arXiv:2404.02202

Primary author: FRANKLIN, Jack (IPPP, Durham University)

Co-authors: MARTINEZ SOLER, Ivan (Durham U. and IPPP); TURNER, Jessica (Durham University); PEREZ-GONZALEZ, Yuber F

Presenter: FRANKLIN, Jack (IPPP, Durham University)

Session Classification: Young Scientist Forum

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

Vortex effects in merging Q-balls: a theoretical laboratory for merging black holes?

Wednesday, July 3, 2024 12:45 PM (5 minutes)

We will discuss vorticity as an intrinsic property of highly-spinning black holes. The connection between vorticity and limiting spin represents a universal feature shared by objects of maximal microstate entropy, so-called saturons. Using Q-ball-like saturons as a laboratory for black holes, we study the collision of two such objects and find that vorticity can have a large impact on the emitted radiation as well as on the charge and angular momentum of the final configuration. As black holes belong to the class of saturons, we expect that the formation of vortices can cause similar effects in black hole mergers, leading to macroscopic deviations in gravitational radiation. This could leave unique signatures detectable with upcoming gravitational-wave searches, which can thereby serve as a portal to macroscopic quantum effects in black holes.

Title of the Poster/Talk

Related Papers/Preprints

https://arxiv.org/abs/2310.02288

Primary author: ZANTEDESCHI, Michael (Tsung-Dao Lee Institute)

Presenter: ZANTEDESCHI, Michael (Tsung-Dao Lee Institute)

Session Classification: Young Scientist Forum

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

Cosmological particle production and PBHs

Wednesday, July 3, 2024 12:50 PM (5 minutes)

Among many mechanisms that produce particles via gravitational interactions, the production of particles from the expansion of the universe represents a simple and irreducible source of particles from the early universe, that can account for the present abundance of dark matter. Another feasible and interesting mechanism is to have a population of primordial black holes that, through evaporation, produce the correct amount of dark matter. Since these black holes can alter the cosmological history, inject entropy and emit particles on their own, they can non-trivially impact the graviational production of particles from the expansion and change the predicted fraction of dark matter. In this talk, I will discuss the interplay between these two mechanisms, while highlighting how the final abundance of dark matter changes in the presence of the primordial black holes. We discuss possible contraints and also investigate the possibility of the dark matter produced from the expansion to generate primordial black holes by gravitational collapse, thus providing a novel production mechanism for the latter.

Title of the Poster/Talk

Cosmological particle production and PBHs

Related Papers/Preprints

Primary authors: BERTUZZO, Enrico (University of Modena); MASSONI SALLA, Gabriel; ZUKANOVICH FUNCHAL, Renata; PEREZ-GONZALEZ, Yuber F

Presenter: MASSONI SALLA, Gabriel

Session Classification: Young Scientist Forum

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

Preheating the String Axiverse

Tuesday, July 2, 2024 4:35 PM (5 minutes)

The standard reheating process after inflation can be preceded by preheating, a phase where the oscillations of the inflaton field at the bottom of its potential lead to explosive production of particles via parametric resonance, potentially altering the history of the universe.
I will discuss an inflating modulus, coupled to an axion via a typical potential coupling coming from type iib string theory on Calabi-Yau orientifolds and explore the consequences of parametric resonance in the string axiverse.

Title of the Poster/Talk

Related Papers/Preprints

arXiv:2312.13431

Primary author: PUTTI, Margherita (Hamburg University UHH - DESY)

Presenter: PUTTI, Margherita (Hamburg University UHH - DESY)

Session Classification: Young Scientist Forum

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

Neutrino masses from new Weinberg-like operators

Monday, July 1, 2024 3:30 PM (5 minutes)

The unique dimension-5 effective operator, $LLHH$, known as the Weinberg operator, generates tiny Majorana masses for neutrinos after electroweak spontaneous symmetry breaking. If there are new scalar multiplets that take vacuum expectation values (VEVs), they should not be far from the electroweak scale. Consequently, they may generate new dimension-5 Weinberg-like operators which in turn also contribute to Majorana neutrino masses. In this study, we consider scenarios with one or two new scalars up to quintuplet SU(2) representations. We analyse the scalar potentials, studying whether the new VEVs can be induced and therefore are naturally suppressed, as well as the potential existence of pseudo-Nambu-Goldstone bosons. Additionally, we also obtain general limits on the new scalar multiplets from direct searches at colliders, loop corrections to electroweak precision tests and the W-boson mass.

Title of the Poster/Talk

Related Papers/Preprints

https://arxiv.org/abs/2312.13356

Primary author: VATSYAYAN, Drona (IFIC, Universitat de Valencia)

Presenter: VATSYAYAN, Drona (IFIC, Universitat de Valencia)

Session Classification: Young Scientist Forum

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

Gravitational wave imprints of the doublet left-right symmetric model

We study the stochastic gravitational wave (GW) background resulting from the strong first-order phase transition (SFOPT) associated with $SU(2)_R \times U(1)_{B-L}$-breaking in the doublet left-right symmetric model (DLRSM). For different values of the symmetry-breaking scale $v_R = 20,\ 30$, and 50 TeV, we construct the one-loop finite temperature effective potential to explore the parameter space for regions showing SFOPT. We identify the region where the associated GW background is strong enough to be detected at planned GW observatories. A strong GW signature favors a relatively light CP-even neutral scalar H_3, arising from the $SU(2)_R$ doublet. The $SU(2)_L$ subgroup of DLRSM is broken by three {\it vevs}: $\kappa_1,\ \kappa_2$, and v_L. We also observe a preference for $\mathcal{O}(1)$ values of the ratio $w = v_L/\kappa_1$, but no clear preference for the ratio $r = \kappa_2/\kappa_1$. A large number of points with strong GW signal can be ruled out from precise measurement of the trilinear Higgs coupling and searches for H_3 at the future colliders.

Title of the Poster/Talk

Gravitational wave imprints of the doublet left-right symmetric model

Related Papers/Preprints

arxiv: 2309.12023, accepted in PRD

Primary author: RINGE, Dhruv (Indian Institute of Technology Indore)

Co-author: Mr KARMAKAR, Siddhartha (IIT Bombay)

Presenter: RINGE, Dhruv (Indian Institute of Technology Indore)

Session Classification: Poster Session

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

Exploring cosmological phase transitions with pulsar timing arrays

Wednesday, July 3, 2024 12:55 PM (5 minutes)

Last year pulsar timing arrays unveiled the first detection of a stochastic gravitational wave background at nano-Hertz frequencies. The background could potentially arise from a population of merging supermassive black holes or –arguably even more exciting –an event in the early cosmos. In this talk, I will discuss the possibility that the recently measured signal stems from a phase transition that happened within the first second after the Big Bang. The specific focus of the talk will be under which conditions phase transitions in a dark sector can serve as an explanation compatible with constraints from precision cosmology. I will conclude with a comment on the question of the likelihood of a new physics explanation.

Title of the Poster/Talk

Exploring cosmological phase transitions with pulsar timing arrays

Related Papers/Preprints

Main focus of talk is on https://inspirehep.net/literature/2669369. Some comments on https://inspirehep.net/literature/26734 will be made.

Primary author: TASILLO, Carlo (DESY Hamburg)

Co-authors: Dr SCHMIDT-HOBERG, Kai (DESY); DEPTA, Paul Frederik (Max-Planck-Institut für Kernphysik); Dr KONSTANDIN, Thomas (DESY); BRINGMANN, Torsten (University of Oslo)

Presenter: TASILLO, Carlo (DESY Hamburg)

Session Classification: Young Scientist Forum

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

What is the wave packet size of neutrinos?

Monday, July 1, 2024 3:55 PM (5 minutes)

Neutrino oscillations are a nature given interferometer and as such is a door to better explore the quantum realm. In this work we address the question of how to compute the neutrino wavepacket width from first principles based on decoherence models. We show how the relevant parameters end up fixed solely by the mother particle interactions.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: ALVES, Gustavo (University Of Sao Paulo); SONG, Ningqiang (Queen's University and Perimeter Institute); MACHADO, Pedro (Fermilab); Prof. W. LI, Shirley (UC Irvine)

Presenter: ALVES, Gustavo (University Of Sao Paulo)

Session Classification: Young Scientist Forum

Contribution ID: **18** Type: **not specified**

A framework for Sommerfeld effect and bound state formation of colored mediators in dark matter studies

Simplified t-channel dark matter models serve as a versatile and well-motivated framework for rich dark sectors that are widely studied by ongoing experimental and theoretical efforts. In this work,
we investigate the impact of non-perturbative effects on the dark matter relic abundance for two representative models of this kind of models, focusing on regions of parameter space where coannihilations of colored mediators are important.
In such scenarios, it is well known that the Sommerfeld enhancement and bound state formation processes can significantly alter the predictions for the model parameters of the dark matter candidate.
Besides including the effects stated above, we take into account the effects of excited states beyond the ground state. We will present constraints on models with fermionic and scalar mediators, highlighting the differences and common features of these two.
Moreover, we introduce code that seamlessly integrates with micrOMEGAs 6.0, which can be easily adapted by the user for different models.

Title of the Poster/Talk

A framework for Sommerfeld effect and bound state formation of colored mediators in dark matter studies

Related Papers/Preprints

Primary author: NAPETSCHNIG, Martin (Technische Universität München)

Co-authors: Mr COPELLO, Emanuele; Prof. HARZ, Julia (Johannes-Gutenberg University of Mainz); Dr BECKER, Mathias (Johannes-Gutenberg University of Mainz)

Presenter: NAPETSCHNIG, Martin (Technische Universität München)

Session Classification: Poster Session

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

Riding the dark matter wave: Novel limits on general dark photons from LISA Pathfinder

Tuesday, July 2, 2024 12:15 PM (5 minutes)

I demonstrate the possibility to perform a parametrically improved search for gauged baryon (B) and baryon minus lepton ($B-L$) Dark Photon Dark Matter (DPDM) using auxiliary channel data from LISA Pathfinder. In particular I point out the use of the measurement of the differential movement between the test masses (TMs) and the space craft (SC) which is nearly as sensitive as the tracking between the two TMs. TMs and SC are made from different materials and therefore have different charge-to-mass ratios for both $B-L$ and B. Thus, the surrounding DPDM field induces a relative acceleration of nearly constant frequency. For the case of $B-L$, I show that LISA Pathfinder can constrain previously unexplored parameter space, providing the world leading limits in the mass range $4 \cdot 10^{-19}$ eV

Title of the Poster/Talk

Riding the dark matter wave: Novel limits on general dark photons from LISA Pathfinder

Related Papers/Preprints

2310.06017

Primary authors: KAHLHOEFER, Felix (DESY); JAECKEL, Joerg (IPPP Durham University); FRERICK, Jonas (DESY-T); SCHMIDT-HOBERG, Kai (DESY)

Presenter: FRERICK, Jonas (DESY-T)

Session Classification: Young Scientist Forum

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

The Chiral Lagrangian of CP-Violating Axion-Like Particles

Tuesday, July 2, 2024 4:40 PM (5 minutes)

CP-violating probes are among the most promising and yet relatively unexplored ways to look for Axion-Like Particles (ALPs) and to investigate their phenomenology. With this work we construct the most general effective Chiral Lagrangian describing the interactions of a light CP-violating ALP ϕ with mesons, baryons, leptons and photons at energies below the QCD confinement scale ($m_\phi < E < {}_{\rm QCD}$), both in a 2-flavors setting and in a 3-flavors one.
Starting from the most general dimension-5, $SU(3)_c \times U(1)_{\rm em}$ invariant effective Lagrangian for a CP-violating ALP at the electroweak (EW) scale, we provide the running of its Wilson coefficients down to the QCD one, where we discuss the matching conditions onto its chiral counterpart. We then report the minimal set of Jarlskog invariants measuring in a basis-independent way the amount of CP violation introduced by the theory at low energies, which can then be bounded by experiments and directly related to the Wilson coefficients of the EW-scale Lagrangian. The Feynman rules for the low-energy theory can be extracted directly from the FeynRules model we have constructed, which can be employed as well for future dedicated phenomenological analyses.

Title of the Poster/Talk

The Chiral Lagrangian of CP-Violating Axion-Like Particles

Related Papers/Preprints

arXiv:2311.12158, https://inspirehep.net/literature/2724864

Primary author: LEVATI, Gabriele (Istituto Nazionale di Fisica Nucleare)

Presenter: LEVATI, Gabriele (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

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

Freeze-in at stronger coupling and the highest temperature in the Universe

Thursday, July 4, 2024 12:30 PM (5 minutes)

When the Dark Matter (DM) mass is higher than the temperature of the thermal bath, DM can produced via the freeze-in mechanism with coupling as high as $O(1)$. This leads to an observationally attractive scenario compared to the standard freeze-in couplings that are $O(10^{-10})$. In fact, it can be probed by direct detection experiments and at LHC.

We display this mechanism in the scalar DM case. We then present a UV-completed framework where the maximal SM temperature coincides with or is approximately the reheating temperature. We exemplify this in the case of the inflation primarily decaying into feebly interacting right-handed neutrinos.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: COSME, Catarina (U. Coimbra); COSTA, Francesco; COVI, Laura (Institute for theoretical physics); Prof. LEBEDEV, Oleg (University of Helsinki)

Presenter: COSTA, Francesco

Session Classification: Young Scientist Forum

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

Hidden in the background: BBN photodisintegration limits on relics decaying into neutrinos.

Monday, July 1, 2024 3:35 PM (5 minutes)

Constraints on dark sector particles decaying into neutrinos typically focus on their impact on the effective number of relativistic species, N_{eff}, in the early Universe. However, for heavy relics with longer lifetimes, constraints mainly arise from the photo-disintegration of primordial abundances. The high-energy neutrinos injected by the decay can interact with both the thermal neutrinos and other high-energy neutrinos. Among these interactions, annihilations into electromagnetic particles will induce an electromagnetic cascade that affects the abundances of the already formed light elements via photo-disintegration. In this work, we present constraints on these dark sector particles. Specifically, we implement a Monte Carlo code to simulate the electromagnetic cascade, instead of solving the full set of Boltzmann equations. We find improved bounds on the particle's lifetime, abundance, and mass.

Title of the Poster/Talk

BBN constraints on neutrino injection into the early Universe

Related Papers/Preprints

Primary authors: FRERICK, Jonas (DESY-T); Dr SCHMIDT-HOBERG, Kai (Deutsches Elektronen-Synchrotron DESY); Dr HUFNAGEL, Marco (Service de Physique Th´eorique, Universit´e Libre de Bruxelles); DEPTA, Paul Frederik (Max-Planck-Institut für Kernphysik); BIANCO, Sara (DESY Hamburg); Dr HAMBYE, Thomas (Service de Physique Th´eorique, Universit´e Libre de Bruxelles)

Presenter: BIANCO, Sara (DESY Hamburg)

Session Classification: Young Scientist Forum

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

Heavy neutral lepton corrections to SM boson decays: lepton flavour universality violation in low-scale seesaw realisations

Monday, July 1, 2024 6:20 PM (5 minutes)

We study the impact of the presence of heavy neutral leptons (HNL) on lepton flavour universality and electroweak precision observables (EWPO). In view of the increasing experimental sensitivity, we consider the one-loop contributions of the HNL to the several observables under scrutiny. We show the significance of next-to-leading order corrections to lepton flavour universality in $Z \to \ell\ell$ ratios and to the invisible Z decay width, in which the one-loop contributions can exceed the current experimental uncertainty. Furthermore, we discuss the complementarity between charged lepton flavour violating (cLFV) and EWPO, and emphasise on the key role of the invisible Z width to explore regimes with negligible to significant cLFV contributions.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: TEIXEIRA, Ana M. (LPC Clermont-Ferrant); ABADA, Asmaa; PINSARD, Emanuelle (University of Zurich); KRIEWALD, Jonathan; ROSAURO-ALCARAZ, Salvador

Presenter: PINSARD, Emanuelle (University of Zurich)

Session Classification: Young Scientist Forum

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

High Frequency Gravitational Wave Bounds from Galactic Neutron Stars

Wednesday, July 3, 2024 1:05 PM (5 minutes)

High-Frequency Gravitational Waves (HFGWs) constitute a unique window on the early Universe as well as exotic astrophysical objects. If the current gravitational wave experiments are more dedicated to the low frequency regime, the graviton conversion into photons in a strong magnetic field constitutes a powerful tool to probe HFGWs. In this paper, we show that neutron stars, due to their extreme magnetic field, are a perfect laboratory to study the conversion of HFGWs into photons. Using realistic models for the galactic neutron star population, we calculate for the first time the expected photon flux induced by the conversion of an isotropic stochastic gravitational wave background in the magnetosphere of the ensemble of neutron stars present in the Milky Way. We compare this photon flux to the observed one from several telescopes and derive upper limits on the stochastic gravitational wave background in the frequency range 10^8 Hz - 10^{25} Hz. We find our limits to be competitive in the frequency range 10^8 Hz - 10^{15} Hz.

Title of the Poster/Talk

High Frequency Gravitational Wave Bounds from Galactic Neutron Stars

Related Papers/Preprints

2402.14092

Primary authors: BERTOLEZ, Antoni; COSTA, Francesco; DANDOY, Virgile (Université Libre de Bruxelles)

Presenter: DANDOY, Virgile (Université Libre de Bruxelles)

Session Classification: Young Scientist Forum

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

Limits on heavy neutral leptons, Z' bosons and majorons from high-energy supernova neutrinos

Light hypothetical particles with masses up to $\mathcal{O}(100)$ MeV can be produced in the core of supernovae. Their subsequent decays to neutrinos can produce a flux component with higher energies than the standard flux. We study the impact of heavy neutral leptons, Z' bosons, in particular $U(1)_{L_\mu - L_\tau}$ and $\mathrm{U}(1)_{B-L}$ gauge bosons, and majorons coupled to neutrinos flavor-dependently. We obtain new strong limits on these particles from no events of high-energy SN 1987A neutrinos and their future sensitivities from observations of galactic supernova neutrinos.

Title of the Poster/Talk

Related Papers/Preprints

2312.13627

Primary author: AKITA, Kensuke (University of Tokyo)

Co-authors: MASUD, Mehedi (Chung-Ang University); IM, Sang Hui (IBS-CTPU); YUN, Seokhoon (IBS-CTPU)

Presenter: AKITA, Kensuke (University of Tokyo)

Session Classification: Poster Session

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

White dwarf cooling through neutrinos and L_mu - L_tau

Thursday, July 4, 2024 10:50 AM (5 minutes)

Hot white dwarfs lose energy mainly in the form of neutrinos through plasmon decay from the inner part of the star. BSM physics can have visible contributions to the cooling of these compact objects. The aim of this study is to show how hot white dwarf cooling could be altered by a dark photon from the L_mu - L_tau model and explore these effects from ultra-light to heavy intermediators. This leads to very interesting constraints to this BSM model.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: HOEFKEN ZINK, Jaime (Istituto Nazionale di Fisica Nucleare); Dr FOLDENAUER, Patrick (IFT Madrid)

Presenter: HOEFKEN ZINK, Jaime (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

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

Relic ν Background boosted in Cosmic Reservoirs

Monday, July 1, 2024 3:40 PM (5 minutes)

The relic ν background (RνB) is the 'holy grail'of neutrino physics and it is also the only known Dark Matter subcomponent. Yet, it has so far escaped detection attempts, mainly due to the very low energies and very weak cross-sections involved in the detection channels. In this talk, I will describe the mechanism by which ultra high energy (UHE) cosmic rays, stored in cosmic reservoirs for $\sim$Gyr timescales, can upscatter the RνB to ultra-high energies. For sufficiently high overdensities of the RνB in the location of the source, which may potentially be induced by BSM effects, the up-scattered neutrino flux is within the reach of future UHE neutrino detection experiments (e.g. IceCube-Gen2 and GRAND) and distinguishable from other neutrino signals via its unique features such as its spectral shape and flavour composition. The non-detection of this flux at current UHE neutrino experiments sets the current most stringent bound on neutrino overdensities on the scales of galaxy clusters.

Title of the Poster/Talk

Related Papers/Preprints

Based on AGDM, A. Granelli, J. Nava, F. Sala, to appear.

Primary authors: GRANELLI, Alessandro (Istituto Nazionale di Fisica Nucleare); DE MARCHI, Andrea Giovanni (Istituto Nazionale di Fisica Nucleare); SALA, FILIPPO (Università di Bologna and INFN); NAVA, Jacopo (Istituto Nazionale di Fisica Nucleare)

Presenter: DE MARCHI, Andrea Giovanni (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

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

Flavour Non-Universal Extensions of the Standard Model

Thursday, July 4, 2024 12:40 PM (5 minutes)

Option 1 for Talk / Poster: In this talk, we present a family-non-universal extension of the Standard Model where the first two families feature both quark-lepton and electroweak-flavour unification, via the $SU(4) \times Sp(4)_L \times Sp(4)_R$ gauge group, whereas quark-lepton unification for the third family is realised 'a la Pati-Salam.

Via staggered symmetry breaking steps, this construction offers a natural explanation for the observed hierarchical pattern of fermion masses and mixings, while providing a natural suppression for flavour-changing processes involving the first two generations. If time permits, we will connect this work with an on-going project featuring flavour non-universality and Higgs compositeness.

Option 2 for Talk / Poster: In Effective Field Theories, evanescent operators are introduced to compensate for the breakdown of four-dimensional Dirac identities (e.g. Fierz Identities) when used in combination with dimensional regularization.

In this talk, we provide an alternative approach where contributions of evanescent operators are viewed as corrections to $d = 4$ Dirac relations. This new perspective not only simplifies computations but provides a clearer understanding of the treatment of these evanescent contributions in the context of NLO change of operator bases.

Title of the Poster/Talk

Flavour Non-Universal Extensions of the Standard Model

Related Papers/Preprints

2212.06163

Primary author: PESUT, Marko (University of Zurich)

Presenter: PESUT, Marko (University of Zurich)

Session Classification: Young Scientist Forum

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

The Light Dark Matter eXperiment (LDMX)

The constituents of dark matter are still unknown, and the viable possibilities span a very large mass range. Specific scenarios for the origin of dark matter sharpen the focus on a narrower range of masses: the natural scenario where dark matter originates from thermal contact with familiar matter in the early Universe requires the DM mass to lie within about an MeV to 100 TeV. Considerable experimental attention has been given to exploring Weakly Interacting Massive Particles in the upper end of this range (few GeV –~TeV), while the region ~MeV to ~GeV is largely unexplored. Most of the stable constituents of known matter have masses in this lower range, tantalizing hints for physics beyond the Standard Model have been found here, and a thermal origin for dark matter works in a simple and predictive manner in this mass range as well. It is therefore an exploration priority. If there is an interaction between light DM and ordinary matter, as there must be in the case of a thermal origin, then there necessarily is a production mechanism in accelerator-based experiments. The most sensitive way (if the interaction is not electron-phobic) to search for this production is to use a primary-electron beam to produce DM in fixed-target collisions. The Light Dark Matter eXperiment (LDMX) is a planned electron-beam fixed-target missing-momentum experiment that has unique sensitivity to light DM in the sub-GeV range. This contribution will give an overview of the theoretical motivation, the main experimental challenges and how they are addressed, as well as projected sensitivities in comparison to other experiments.

Title of the Poster/Talk

Related Papers/Preprints

Primary author: ELÉN, Einar (Lund university)

Presenter: ELÉN, Einar (Lund university)

Session Classification: Poster Session

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

Twenty Thousand Leagues from the QCD Axion Band

Thursday, July 4, 2024 12:35 PM (5 minutes)

The QCD axion is one of the most promising solutions to the Strong CP Problem. In Standard QCD axion models, axion solutions lie around a straight line, the so-called canonical QCD axion band. Recently, there have been numerous attempts to find QCD axion solutions away from the canonical band. In this talk, we show how such solutions naturally arise in a variety of UV models.

Title of the Poster/Talk

Twenty Thousand Leagues from the QCD Axion Band

Related Papers/Preprints

Primary author: DE GIORGI, Arturo (UAM/IFT)

Presenter: DE GIORGI, Arturo (UAM/IFT)

Session Classification: Young Scientist Forum

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

Fusing photons into nothing, a new search for invisible ALPs and Dark Matter at Belle II

Thursday, July 4, 2024 10:45 AM (5 minutes)

We consider an axion-like particle coupled to the Standard Model photons and decaying invisibly at Belle~II. We propose a new search in the $e^+e^- +$ invisible channel that we compare against the standard $\gamma +$ invisible channel. We find that the $e^+e^- +$ invisible channel has the potential to ameliorate the reach for the whole ALP mass range. This search leverages dedicated kinematic variables which significantly suppress the Standard Model background. We explore the implications of our expected reach for Dark Matter freeze-out through ALP-mediated annihilations.

Title of the Poster/Talk

Fusing photons into nothing, a new search for invisible ALPs and Dark Matter at Belle II

Related Papers/Preprints

https://arxiv.org/abs/2307.06369

Primary authors: Dr MASTRODDI, Alessio; Prof. REDIGOLO, Diego (INFN Florence); ACANFORA, Francesca; Prof. FRANCESCHINI, Roberto (University of Roma Tre)

Presenter: ACANFORA, Francesca

Session Classification: Young Scientist Forum

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

Model Independent test for T-violation with T2HK and DUNE

Thursday, July 4, 2024 12:45 PM (5 minutes)

We studied the Time reversal symmetry violation in a model-independent way for the long baseline experiments T2HK and DUNE. The theoretical framework allows us to find the energy bins that provide sensitivity for T-violation test. We then perform extensive numerical simulations on the appearance probabilities to testify our theoretical calculations. The measurement accuracy at the near detector and the better detector resolution significantly improve the χ^2 analysis.

Title of the Poster/Talk

Model Independent test for T-violation with T2HK and DUNE

Related Papers/Preprints

Primary authors: Ms SHARMA, Kiran (Karlsruhe Institute of Technology(1), IIT Bhilai(2)); Dr CHATTERJEE, Sabya Sachi (Karlsruhe Institute of Technology); Prof. SCHWETZ, Thomas (Karlsruhe Institute of Technology)

Presenter: Ms SHARMA, Kiran (Karlsruhe Institute of Technology(1), IIT Bhilai(2))

Session Classification: Young Scientist Forum

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

Not so inelastic Dark Matter

Tuesday, July 2, 2024 12:35 PM (5 minutes)

Models of inelastic (or pseudo-Dirac) dark matter commonly assume an accidental symmetry between the left-handed and right-handed mass terms in order to suppress diagonal couplings. Here we point out that this symmetry is unnecessary, because for Majorana fermions the diagonal couplings are in fact not strongly constrained. Removing the requirement of such an accidental symmetry in fact relaxes the relic density constraint, because additional annihilation modes can contribute, leading to larger viable parameter space. We discuss how the sensitivity of searches for both long-lived particles and missing energy signatures is modified in such a set-up, and explore the relevance of events with two long-lived particles.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: KAHLHOEFER, Felix (DESY); DALLA VALLE GARCIA, Giovani (IAP - KIT); Dr OVCHYNNIKOV, Maksym (IAP - KIT); SCHWETZ-MANGOLD, Thomas (Karlsruhe Institute of Technology)

Presenter: DALLA VALLE GARCIA, Giovani (IAP - KIT)

Session Classification: Young Scientist Forum

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

ALP leptogenesis

Thursday, July 4, 2024 10:35 AM (5 minutes)

We propose a novel realisation of leptogenesis that relies on the out-of-equilibrium decay of an axion-like particle (ALP) into right-handed Majorana neutrinos (RHN) in the Early Universe. With respect to thermal leptogenesis and for any RHN mass down to a TeV, our mechanism improves by a factor of ~ 100 the tuning in the RHN mass splittings needed to reproduce the baryon asymmetry of the universe and neutrino masses. ALP leptogenesis requires $m_a > 10^4$ GeV and $f_a > 10^{11}$ GeV for the ALP mass and decay constant, and predicts an early period of matter domination by the ALP in parts of its parameter space.
We finally provide a viable supersymmetric realisation of ALP leptogenesis where the ALP is the R-axion, which accommodates GeV gravitino dark matter and predicts RHN below 10 TeV.

Title of the Poster/Talk

ALP leptogenesis

Related Papers/Preprints

Primary authors: MARIOTTI, Alberto (VUB); SALA, FILIPPO (Università di Bologna and INFN); CATALDI, Martina (Hamburg University); VANVLASSELAER, Miguel (VUB); PASCOLI, Silvia (University of Bologna)

Presenter: CATALDI, Martina (Hamburg University)

Session Classification: Young Scientist Forum

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

Tri-hypercharge and tri-unification: a path to the origin of flavour

Thursday, July 4, 2024 10:55 AM (5 minutes)

The tri-hypercharge proposal introduces a separate gauged weak hypercharge assigned to each fermion family as the origin of flavour. This is arguably one of the simplest setups for building "gauge non-universal theories of flavour"or "flavour deconstructed theories", which are receiving increasing attention in recent years. Firstly, I will breafly introduce the tri-hypercharge proposal and show how fermion mass hierarchies and small quark mixing arise naturally in such a setup, correlated with a significant amount of meaningful phenomenology. Secondly, I will show how the aforementioned tri-hypercharge theory, along with a larger set of flavour deconstructed theories, may arise from a gauge unified "tri-unification"framework based on a $SU(5)^3$ gauge symmetry supplemented with a cyclic permutation symmetry that ensures a single gauge coupling at the GUT scale.

Title of the Poster/Talk

Related Papers/Preprints

2305.07690, 2311.05683, 2404.12442

Primary author: FERNÁNDEZ NAVARRO, Mario (University of Glasgow)

Co-authors: VICENTE, Avelino (IFIC (CSIC - U. Valencia)); Prof. KING, Steve (University of Southampton)

Presenter: FERNÁNDEZ NAVARRO, Mario (University of Glasgow)

Session Classification: Young Scientist Forum

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

A closer look at dark photon production modes

High luminosity colliders and fixed target facilities using proton beams are sensitive to new weakly coupled degrees of freedom across a broad mass range. We discuss various production modes for dark vector particles in proton beam experiments. In particular, we will have a closer look at bremsstrahlung which is important for dark vectors with masses between 0.5 GeV and 1.5 GeV, due to resonant mixing with hadronic resonances. We revisit the calculation of dark photons via initial state radiation in non-single diffractive scattering, using an improved approach to the splitting function and the timelike electromagnetic form-factor. The framework is benchmarked by applying an analogous calculation to model inclusive rho-meson production, indicating agreement with data from NA27 in the relevant kinematic range. In addition, we add dark photon couplings to quarks to the parton shower in Herwig to study the effect of Parton-level dark photon radiation on the overall production rate of dark photons in proton-proton collisions.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: RITZ, Adam (University of Victoria); MASOUMINIA, Aidin (IPPP, Durham University); REIMITZ, Peter (Instituto de Fisica, USP); FOROUGHI ABARI, Saeid (University of Victoria); PLAETZER, Simon (University of Vienna)

Presenter: REIMITZ, Peter (Instituto de Fisica, USP)

Session Classification: Poster Session

Contribution ID: **40** Type: **not specified**

Solar reflection of dark matter with dark-photon mediators

Tuesday, July 2, 2024 12:20 PM (5 minutes)

We consider the scattering of low-mass halo dark-matter particles in the hot plasma of the Sun, focusing on dark matter that interact with ordinary matter through a dark-photon mediator. The resulting "solar-reflected" dark matter (SRDM) component contains high-velocity particles, which significantly extend the sensitivity of terrestrial direct-detection experiments to sub-MeV dark-matter masses. We use a detailed Monte-Carlo simulation to model the propagation and scattering of dark-matter particles in the Sun, including thermal effects, with special emphasis on ultralight dark-photon mediators. We study the properties of the SRDM flux, obtain exclusion limits from various direct-detection experiments, and provide projections for future experiments, focusing especially on those with silicon and xenon targets. We find that proposed future experiments with xenon and silicon targets can probe the entire "freeze-in benchmark", in which dark matter is coupled to an ultralight dark photon, including dark-matter masses as low as O(keV). Our simulations and SRDM fluxes are publicly available.

Title of the Poster/Talk

Solar reflection of dark matter with dark-photon mediators

Related Papers/Preprints

https://arxiv.org/abs/2404.10066

Primary authors: XU, Hailin (Stony Brook University); ESSIG, Rouven (Stony Brook University); EMKEN, Timon (Stockholm University)

Presenter: XU, Hailin (Stony Brook University)

Session Classification: Young Scientist Forum

Contribution ID: **41** Type: **not specified**

The SABRE South Experiment at the Stawell Underground Physics Laboratory

The SABRE experiment aims to detect an annual rate modulation from dark matter interactions in ultra-high purity NaI(Tl) crystals in order to provide a model independent test of the signal observed by DAMA/LIBRA. It is made up of two separate detectors that rely on joint crystal R&D activity; SABRE South located at the Stawell Underground Physics Laboratory (SUPL), in regional Victoria, Australia, and SABRE North at the Laboratori Nazionali del Gran Sasso (LNGS).

SABRE South is designed to disentangle seasonal or site-related effects from the dark matter-like modulated signal by using an active veto and muon detection system. Ultra-high purity NaI(Tl) crystals are immersed in a Linear Alkyl Benzene (LAB) based liquid scintillator veto, further surrounded by passive steel and polyethylene shielding and a plastic scintillator muon veto. Significant work has been undertaken to understand and mitigate the background processes, taking into account radiation from the detector materials, from both intrinsic and cosmogenic activated processes, and to understand the performance of both the crystal and veto systems.

SUPL is a newly built facility located 1024 m underground (~2900 m water equivalent) within the Stawell Gold Mine and its construction has been completed in 2023.

The commissioning of SABRE South started in early 2024 and the first equipment including the muon detectors have been already installed in SUPL.

This talk will report on the general status of the SABRE South assembly, its expected performance, and the design of SUPL.

Title of the Poster/Talk

The SABRE South Experiment at the Stawell Underground Physics Laboratory

Related Papers/Preprints

Primary author: ., The SABRE South Collaboration

Presenter: ., The SABRE South Collaboration

Session Classification: Poster Session

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

HyperLSW: An ultimate experiment to determine the amount of dark matter axions

Tuesday, July 2, 2024 4:45 PM (5 minutes)

After discovering dark matter (DM) axions in a haloscope, follow-up experiments will be required to break the degeneracy between the axion coupling to photons and its local DM abundance. Since a discovery would justify more significant investments, I assess the ability of ambitious light-shining-through-a-wall (LSW) experimental designs to target the QCD axion band. The measurement of the axion mass through the haloscope discovery would allow one to choose a suitable magnetic field configuration to reach sensitivity at masses in the QCD axion band. I show that a wide range of well-motivated QCD axion models is accessible to such experiments, making it possible to determine whether axions are the dominant DM in the Universe. Since this represents the first concrete realization of a post-discovery experimental program, I comment on its challenges, as well as complementary experiments and future directions beyond LSW experiments.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: LUCENTE, Giuseppe (Institute for Theoretical Physics, University of Heidelberg); JAECKEL, Joerg (IPPP Durham University); HOOF, Sebastian (Università degli Studi di Padova)

Presenter: LUCENTE, Giuseppe (Institute for Theoretical Physics, University of Heidelberg)

Session Classification: Young Scientist Forum

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

GeV ALP from TeV Vector-like Leptons

Thursday, July 4, 2024 10:40 AM (5 minutes)

The generation of a mass for an axion-like-particle is a long-standing open issue. We propose a model where a GeV mass for this pseudo-scalar particle is predicted in a large portion of the parameter space due to the presence of explicit Peccei-Quinn symmetry-breaking terms in an exotic leptonic sector. The latter provides a solution to the muon $g-2$ anomaly, within the framework of the Linear Seesaw neutrino mechanism. The spectrum is extended by a complex scalar singlet only transforming under the Peccei-Quinn symmetry, which generates the axion-like-particle. Its couplings with fermions can continuously span over many orders of magnitude, which constitutes a specific feature of this model in contrast to generic ultraviolet constructions.

Title of the Poster/Talk

GeV ALP from TeV Vector-like Leptons

Related Papers/Preprints

arXiv:2402.14059

Primary authors: DE GIORGI, Arturo (UAM/IFT); Prof. MERLO, Luca (UAM); FUENTES ZAMORO, Marta (Universidad Autónoma de Madrid)

Presenter: FUENTES ZAMORO, Marta (Universidad Autónoma de Madrid)

Session Classification: Young Scientist Forum

Contribution ID: **44** Type: **not specified**

Neutrino masses and $0\nu\beta\beta$ decays in leptoquark models

Monday, July 1, 2024 6:05 PM (5 minutes)

We explore the potential of neutrinoless double-beta ($0\nu\beta\beta$) decays to probe scalar leptoquark models that dynamically generate Majorana masses at the one-loop level. By relying on Effective Field Theories, we perform a detailed study of the correlation between neutrino masses and the $0\nu\beta\beta$ half-life in these models. We describe the additional tree-level leptoquark contributions to the $0\nu\beta\beta$ amplitude with higher-dimensional operators, which can overcome the ones from the standard dimension-five Weinberg operator for leptoquark masses as large as $\mathcal{O}(500\,\mathrm{TeV})$. In particular, we highlight a possibly ambiguity in the determination of neutrino mass ordering by only using $0\nu\beta\beta$ decays in this type of models. The interplay between $0\nu\beta\beta$ with other flavor measurements is also explored and we discuss the importance of properly accounting for the neutrino and charged-lepton mixing matrices in our predictions.

Title of the Poster/Talk

Neutrino masses and $0\nu\beta\beta$ decays in leptoquark models

Related Papers/Preprints

Primary authors: SANTOS LEAL, Luighi Pierre (Universidade de São Paulo); SUMENSARI, Olcyr (IJCLab (Orsay)); ZUKANOVICH FUNCHAL, Renata; FAJFER, Svjetlana (University of Ljubljana and J. Stefan Institute)

Presenter: SANTOS LEAL, Luighi Pierre (Universidade de São Paulo)

Session Classification: Young Scientist Forum

Contribution ID: **45** Type: **not specified**

The ALP window to HNLs

Axion-Like Particles (ALPs) and Heavy Neutral Leptons (HNLs) represent compelling extensions to the Standard Model, each offering solutions to distinct shortcomings of this framework. Investigating the simultaneous presence of both ALPs and HNLs opens an intriguing window for new detection opportunities. We focus on a particularly promising process, the JALZ topology, which exploits the fermion-mass proportionality of ALP couplings. We study the possible production mechanisms that could play a relevant role at both the Large Hadron Collider (LHC) and future Muon Colliders, as well as various final states resulting from the inclusion of two HNLs. These different outcome configurations lead to distinct experimental signatures providing potential avenues for detecting these elusive particles.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: BURGOS, Marta; DE GIORGI, Arturo (UAM/IFT); Prof. MERLO, Luca (UAM); Dr TASTET, Jean-Loup (UAM-IFT)

Presenter: BURGOS, Marta

Session Classification: Poster Session

Contribution ID: **47** Type: **not specified**

Topological Portal to the Dark Sector

Tuesday, July 2, 2024 12:25 PM (5 minutes)

We propose a topological portal between quantum chromodynamics (QCD) and a dark QCD-like sector. Such a portal is present only for a unique coset structure after QCD confinement and it connects three QCD to two dark pions. When gauged, it is the leading portal between the two sectors, providing an elegant self-consistent scenario of light thermal inelastic dark matter. The inherent antisymmetrization due to a Wess–Zumino–Witten-like effective interaction leads to diminished annihilations at later times and suppressed direct detection. However, novel collider signatures offer tremendous prospects for discovery at Belle II.

Title of the Poster/Talk

Topological Portal to the Dark Sector

Related Papers/Preprints

https://arxiv.org/pdf/2401.09528

Primary author: SELIMOVIC, Nudzeim (INFN Padova)

Presenter: SELIMOVIC, Nudzeim (INFN Padova)

Session Classification: Young Scientist Forum

Contribution ID: **49** Type: **not specified**

Going beyond cosmological bounds on the neutrino masses

Monday, July 1, 2024 6:00 PM (5 minutes)

CMB and LSS measurements are placing the best upper bounds on the sum of the neutrino masses. Even more, a detection is currently promised by experiments such as EUCLID, which is already taking data. However, these results are model dependent and are relaxed if new physics in the neutrino sector exists. In this context, we present a framework to disentangle the different effects on neutrino masses on cosmology in a model independent manner. Finally, we present how do cosmological observations constrain each of these effects.

Title of the Poster/Talk

Going beyond cosmological bounds on the neutrino masses

Related Papers/Preprints

The preprint is gonna be published soon in the arXiV

Primary author: BERTÓLEZ-MARTÍNEZ, Toni (Universitat de Barcelona)

Presenter: BERTÓLEZ-MARTÍNEZ, Toni (Universitat de Barcelona)

Session Classification: Young Scientist Forum

Contribution ID: **51** Type: **not specified**

θ-dependence of α-decay half-lives

Tuesday, July 2, 2024 4:50 PM (5 minutes)

In this talk we present a theoretical analysis of the θ-dependence of α-decay half-lives for heavy isotopes, which provides a method to explore axion dark matter. To test such effect, a setup has recently been constructed and installed at the Gran Sasso Laboratory, based on the α-decay of Americium-241. This prototype experiment will allow us to explore a broad range of axion masses, setting competitive limits on the axion decay constant.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: BROGGINI, Carlo (Istituto Nazionale di Fisica Nucleare); TONI, Claudio (Istituto Nazionale di Fisica Nucleare); DI CARLO, Giuseppe (Istituto Nazionale di Fisica Nucleare); DI LUZIO, Luca (Istituto Nazionale di Fisica Nucleare)

Presenter: TONI, Claudio (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

Contribution ID: **53** Type: **not specified**

Loop Blow-Up Inflation: a new inflationary model from string theory

Thursday, July 4, 2024 12:50 PM (5 minutes)

The topic of this talk will be a new inflationary model called 'Loop Blow-Up Inflation', first presented in 2403.04831. This model originates from string theory, by including string loop corrections in the potential of a blow-up Kähler modulus, a scalar field playing the role of the inflaton. The loop effects become dominant as soon as the inflaton is displaced from its post-inflationary minimum, giving rise to an inflationary potential with an inverse-power law behaviour. This talk will focus mostly on the post-inflationary history and reheating mechanisms predicted for different brane set-ups that realize the Standard Model. The predictions for the spectral index, the tensor-to-scalar ratio, and dark radiation are in good agreement with CMB data.

Title of the Poster/Talk

Related Papers/Preprints

https://arxiv.org/pdf/2403.04831

Primary authors: HEBECKER, Arthur-Georg; BRUNELLI, Luca (Università di Bologna); CICOLI, Michele (Istituto Nazionale di Fisica Nucleare); KUESPERT, Ruben (University of Heidelberg); BANSAL, Sukruti

Presenter: BRUNELLI, Luca (Università di Bologna)

Session Classification: Young Scientist Forum

Contribution ID: **54** Type: **not specified**

Cogenesis of baryon and dark matter with PBH and QCD axion

Tuesday, July 2, 2024 4:55 PM (5 minutes)

We study the role of an ultra-light primordial black hole (PBH) dominated phase on the generation of baryon asymmetry of the Universe (BAU) and dark matter (DM) in a type-I seesaw framework augmented by Peccei-Quinn (PQ) symmetry which solves the strong CP problem. While the BAU is generated via leptogenesis from the decay of heavy right-handed neutrino (RHN) at the seesaw scale dictated by the PQ scale, DM can arise either from QCD axion or one of the RHNs depending upon the PQ scale. The ultra-light PBH not only affects the axion DM production via misalignment mechanism, but can also produce superheavy RHN DM via evaporation. Depending upon the PBH parameters and relative abundance of axion DM, axion mass can vary over a wide range from sub-μeV to sub-eV keeping the detection prospects promising across a wide range of experiments. While hot axions produced from PBH evaporation can lead to observable $\Delta N_{\rm eff}$ to be probed at future cosmic microwave background (CMB) experiments, stochastic gravitational waves (GW) produced from PBH density fluctuations can be observed at future detectors like CE, DECIGO, LISA and even future runs of LIGO-VIRGO.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: Dr BORAH, Debasish (Indian Institute of Technology, Guwahati); DAS, Nayan (Indian Institute of Technology, Guwahati, India); Dr SAMANTA, Rome (Istituto Nazionale di Fisica Nucleare (INFN), Napoli, Italy); Dr DAS, Suruj Jyoti (Institute for Basic Science, Korea)

Presenter: DAS, Nayan (Indian Institute of Technology, Guwahati, India)

Session Classification: Young Scientist Forum

Contribution ID: **56** Type: **not specified**

Quantisation Across Bubble wall and Friction

Wednesday, July 3, 2024 1:00 PM (5 minutes)

I will start by explaining why it is interesting and how one can quantise from first principles field theories living on the background of a bubble wall in the planar limit, i.e. a domain wall, with a particular focus on the case of spontaneous breaking of gauge symmetry. Using the tools I introduced, we can compute the average momentum transfer from transition radiation, which denotes the soft emission of radiation by a high-energetic particle passing across the wall, with a particular focus on the longitudinal polarisation of vector bosons. We find this latter one to be comparable to transverse polarisations in symmetry-breaking transitions with mild super-cooling, and dominant in broken to broken transitions with thin walls. Our results have phenomenological applications for the expansion of bubbles during first-order phase transitions. Our general framework allows for the calculation of any particle processes of interest in such translation breaking backgrounds.

Title of the Poster/Talk

Quantisation Across Bubble wall and Friction

Related Papers/Preprints

https://arxiv.org/abs/2310.06972

Primary author: BARNI, Giulio (Istituto Nazionale di Fisica Nucleare)

Presenter: BARNI, Giulio (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

Contribution ID: **57** Type: **not specified**

Probing conversion-driven freeze-out at the LHC

Tuesday, July 2, 2024 12:30 PM (5 minutes)

Conversion-driven freeze-out is an appealing mechanism to explain the observed relic density while naturally accommodating the null-results from direct and indirect detection due to a very weak dark matter coupling. Interestingly, the scenario predicts long-lived particles decaying into dark matter with lifetimes favorably coinciding with the range that can be resolved at the LHC. However, the small mass splitting between the long-lived particle and dark matter renders the decay products soft, challenging current search strategies. We consider four different classes of searches covering the entire range of lifetimes: heavy stable charge particles, disappearing tracks, displaced vertices, and missing energy searches. We discuss the applicability of these searches to conversion-driven freeze-out and derive current constraints highlighting their complementarity. For the displaced vertices search, we demonstrate how a slight modification of the current analysis significantly improves its sensitivity to the scenario.

Title of the Poster/Talk

Probing conversion-driven freeze-out at the LHC

Related Papers/Preprints

https://arxiv.org/pdf/2404.16086

Primary authors: LESSA, Andre; HEISIG, Jan; RAMOS, Lucas (University of Sao Paulo)

Presenter: RAMOS, Lucas (University of Sao Paulo)

Session Classification: Young Scientist Forum

Contribution ID: **58** Type: **not specified**

Axion-Like Particles in Radiative Quarkonia Decays

Thursday, July 4, 2024 10:30 AM (5 minutes)

Radiative quarkonia decays offer an ideal setup for probing Axion-Like Particle (ALP) interactions. In this talk, we will present the results of our recent analysis of this type of processes including an updated set of new experimental searches. This analysis consists of a comprehensive study of the production channels in the process $e^+e^- \to a\,\gamma$ in B- and Charm-factories, as well as all the different possible decay channels of the ALP. Several benchmarks are used such that the bounds obtained can be understood in terms of fewer parameters of the theory and highlight features of different UV completions.

Title of the Poster/Talk

Axion-Like Particles in Radiative Quarkonia Decays

Related Papers/Preprints

https://arxiv.org/abs/2402.12454

Primary author: PONCE DIAZ, Xavier (Istituto Nazionale di Fisica Nucleare)

Presenter: PONCE DIAZ, Xavier (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

Contribution ID: **61** Type: **not specified**

Shedding light on the neutrino charge radius with CEνNS data

Monday, July 1, 2024 3:45 PM (5 minutes)

Neutrinos are among the most fascinating particles of the standard model (SM). We know very little about their nature and unveiling their secrets might be the key to broadening our understanding of nature. Despite being extremely elusive particles, they can undergo a process where their interaction cross-section with matter is enhanced by orders of magnitudes: this is Coherent Elastic Neutrino Nucleus Scattering, also known as CEνNS. This process has proven to be a formidable tool for testing our understanding of particle physics, particularly within the realm of electroweak interactions.

In this presentation, I will exploit CEνNS data to present the state-of-the-art constraints on the neutrino charge radius, which the only neutrino electromagnetic property predicted to be non-zero in the standard electroweak theory [1].
Finally, I will show how the momentum dependence on the neutrino charge radius can be exploited to further constrain the allowed parameter space [2].

[1] arXiV: 2205.09484 - JHEP 09 (2022) 164
[2] arXiv 2402.16709 - accepted by JHEP

Title of the Poster/Talk

Shedding light on the neutrino charge radius with CEνNS data

Related Papers/Preprints

https://link.springer.com/article/10.1007/JHEP09(2022)164 ; https://arxiv.org/abs/2402.16709

Primary authors: GIUNTI, Carlo (Istituto Nazionale di Fisica Nucleare); DORDEI, Francesca (INFN CA); CADEDDU, Matteo (Istituto Nazionale di Fisica Nucleare); ATZORI CORONA, Mattia (Istituto Nazionale di Fisica Nucleare); Dr CARGIOLI, Nicola (Università degli Studi di Cagliari/Istituto Nazionale di Fisica Nucleare)

Presenter: ATZORI CORONA, Mattia (Istituto Nazionale di Fisica Nucleare)

Session Classification: Young Scientist Forum

Contribution ID: **63** Type: **not specified**

Freeze-in at Strongly Coupling in the Z' Model

We consider the possibility for Dark Matter (DM) freeze-in occurring at high values of the couplings between the DM and the SM states. Such a possibility requires a reheating temperature of the Universe below the value of the DM mass. Contrary to conventional freeze-in scenarios, the values of the DM couplings required by the correct relic density are within the reach of Direct Detection experiments and LHC searches.
In this talk, we will illustrate the aforementioned scenarios considering a particle physics model in which a fermionic DM candidate interacts with a Z' boson, possibly emerging from a dark $U(1)$ symmetry.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: CABO ALMEIDA, David (University of Messina (Italy)); ARCADI, Giorgio (Istituto Nazionale di Fisica Nucleare); LEBEDEV, Oleg (University of Helsinki)

Presenter: CABO ALMEIDA, David (University of Messina (Italy))

Session Classification: Poster Session

Contribution ID: **67** Type: **not specified**

High-frequency gravitational waves in the geometrical optics approximation

Wednesday, July 3, 2024 1:10 PM (5 minutes)

With the first detection of gravitational waves in 2016 a new window on the observation of the Universe has been opened. This has made possible several new tests of general relativity, discoveries on the physics of black holes, and opened a new way of studying physics beyond the Standard Model. There is evidence that the Standard Model (SM) of particle physics is not the ultimate description of nature as it cannot explain neutrino masses, dark matter, and the baryon asymmetry of the Universe, gravitational waves could be one of the main tools to answer to this question.
So far, gravitational waves have been detected only at low frequencies: at nHz for the recent stochastic background, and 10-100 Hz from the observations of LIGO-VIRGO and KAGRA. Several works showed how it would be possible to get important new information relevant to theoretical particle physics and cosmology at higher frequencies, from MHz to GHz.

In this project we revisit the work "2000 Class. Quantum Grav. 17 2525"by A. M. Cruise, and discuss the validity of the geometrical optics approximation in electromagnetic detectors for very high-frequency gravitational waves

Title of the Poster/Talk

Related Papers/Preprints

Primary author: MARSILI, Luca (IFIC)

Presenter: MARSILI, Luca (IFIC)

Session Classification: Young Scientist Forum

Contribution ID: **68** Type: **not specified**

Testability of Inflection Inflation In Colliders

Thursday, July 4, 2024 12:55 PM (5 minutes)

We introduce a minimal setup to achieve dynamical inflection point inflation, utilizing a minimal framework. Our approach examines collider constraints on inflationary parameters using the same field composition. Specifically, we incorporate a dark SU(2)D gauge sector featuring a dark scalar doublet as the inflaton, accompanied by particle content akin to the Standard Model but with degenerate masses. This configuration facilitates the realization of multiple inflection points in the inflaton potential. Notably, all vector-like particles in the exotic content possess identical Standard Model charges, enabling the inflaton's decay into the visible sector for reheating the universe. Our study establishes a vital link between collider constraints and their implications for inflationary parameters.

Title of the Poster/Talk

Testability of Inflection Inflation In Colliders

Related Papers/Preprints

Primary author: Mr BURK, Francis Marston

Presenter: Mr BURK, Francis Marston (University of Pittsburgh)

Session Classification: Young Scientist Forum

Contribution ID: **69** Type: **not specified**

Exploring the Impact of Quantum Decoherence on Precision Measurements in DUNE and T2HK

Monday, July 1, 2024 6:10 PM (5 minutes)

Abstract: This study delves into how quantum decoherence in neutrinos could influence the precision of standard oscillation parameter measurements in the DUNE and T2HK experiments. Our analysis suggests that the measurements of δ_{CP}, $\sin^2\theta_{13}$, and $\sin^2\theta_{23}$ are notably affected in DUNE, more so than in T2HK. Conversely, DUNE exhibits a higher sensitivity to detecting decoherence effects compared to T2HK. By combining data from both experiments, we demonstrate the potential for achieving robust measurements of standard parameters, which may not be feasible with DUNE data alone.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: Dr GAGO, Alberto (Pontificia Universidad Católica del Perú); Mr CALATAYUD-CADENILLAS, Anthony; Dr TERNER, Christoph (Istituto Nazionale di Fisica Nucleare); Dr BAREBOIM, Gabriela (Universitat de València)

Presenter: Mr CALATAYUD-CADENILLAS, Anthony

Session Classification: Young Scientist Forum

Contribution ID: **70** Type: **not specified**

Unstable Neutrinos: Addressing Oscillation and Decay

Monday, July 1, 2024 6:15 PM (5 minutes)

The neutrino has a lifetime that is significantly longer than the Age of the Universe as it can only decay radiatively via loops with gauge bosons. However the presence of physics Beyond the Standard Model could induce 'visible' neutrino decay between neutrino mass eigenstates. This decay process could be identified in laboratory experiments as well as from astrophysical or cosmological observations. To study neutrino systems that involve both oscillation and decay two main formalisms have been developed—a density matrix approach and a phenomenological approach. In this work we present an analysis of both highlighting the physical effects captured by each framework.

Title of the Poster/Talk

Related Papers/Preprints

Primary authors: Mr PARKER, George (Johannes Gutenberg University Mainz); Dr KOPP, Joachim ((CERN and Johannes Gutenberg University Mainz)); Dr WURM, Michael ((Johannes Gutenberg University Mainz))

Presenter: Mr PARKER, George (Johannes Gutenberg University Mainz)

Session Classification: Young Scientist Forum

Contribution ID: **73** Type: **not specified**

Fabio Maltoni - Particle physics and the quantum

Contribution ID: **74** Type: **not specified**

Fabio Maltoni - Particle physics and the quantum

Friday, July 5, 2024 2:30 PM (30 minutes)

Presenter: MALTONI, Fabio (Università di Bologna)

Session Classification: Day 5

Contribution ID: **75** Type: **not specified**

Serguey Petcov - Status and prospects of neutrino physics

Monday, July 1, 2024 10:00 AM (45 minutes)

Title of the Poster/Talk

Related Papers/Preprints

Presenter: PETKOV, Serguey (Istituto Nazionale di Fisica Nucleare)

Session Classification: Day 1

Contribution ID: **76** Type: **not specified**

Susanne Westhoff - Axion-like particles at colliders

Friday, July 5, 2024 9:45 AM (30 minutes)

Title of the Poster/Talk

Related Papers/Preprints

Presenters: WESTHOFF, Susanne (THEP Mainz); WESTHOFF, Susanne

Session Classification: Day 5

Contribution ID: **77** Type: **not specified**

Jorge Martin Camalich - BSM&flavour: life after the anomalies?

Friday, July 5, 2024 10:15 AM (30 minutes)

Presenter: MARTIN CAMALICH, Jorge (IFIC-Valencia)

Session Classification: Day 5

Contribution ID: **78** Type: **not specified**

Nuria Rius - News on leptogenesis

Friday, July 5, 2024 9:15 AM (30 minutes)

Title of the Poster/Talk

Related Papers/Preprints

Presenter: RIUS, Nuria

Session Classification: Day 5

Contribution ID: **79** Type: **not specified**

Mark Chen - Overview of neutrino experiments: what is new after Neutrino2024?

Monday, July 1, 2024 10:45 AM (45 minutes)

Presenter: CHEN, Mark

Session Classification: Day 1

Contribution ID: **80** Type: **not specified**

Stephen Parke - The Race to the Neutrino Mass Ordering

Monday, July 1, 2024 12:00 PM (30 minutes)

Presenter: PARKE, Stephen

Session Classification: Day 1

Contribution ID: **81** Type: **not specified**

Martin Bauer - Relic neutrino background

Monday, July 1, 2024 12:30 PM (30 minutes)

Presenter: BAUER, Martin (IPPP Durham)

Session Classification: Day 1

Contribution ID: **82** Type: **not specified**

Enrique Fernández-Martinez - BSM with lab neutrinos

Monday, July 1, 2024 2:30 PM (30 minutes)

Presenter: FERNANDEZ MARTINEZ, Enrique (IFT Madrid)

Session Classification: Day 1

Contribution ID: **83** Type: **not specified**

Carlos Argüelles - BSM with sky neutrinos

Monday, July 1, 2024 3:00 PM (30 minutes)

Presenter: ARGÜELLES, Carlos

Session Classification: Day 1

Contribution ID: **84** Type: **not specified**

Jordi Salvado - BSM with cosmological neutrinos

Monday, July 1, 2024 4:30 PM (30 minutes)

Presenter: SALVADO, Jordi

Session Classification: Day 1

Contribution ID: **85** Type: **not specified**

Sebastian Trojanowski - Long-lived particles at accelerators

Monday, July 1, 2024 5:00 PM (30 minutes)

Presenter: TROJANOWSKI, Sebastian

Session Classification: Day 1

Contribution ID: **86** Type: **not specified**

Géraldine Servant - News on electroweak baryogenesis

Friday, July 5, 2024 11:45 AM (30 minutes)

Presenter: SERVANT, Geraldine

Session Classification: Day 5

Contribution ID: **87** Type: **not specified**

Clara Murgui - Atomic sensors for BSM

Monday, July 1, 2024 5:30 PM (30 minutes)

Presenter: MURGUI, Clara (UAB)

Session Classification: Day 1

Contribution ID: **88** Type: **not specified**

Anson Hook - Reflections on the matter/dark matter coincidence

Friday, July 5, 2024 12:15 PM (30 minutes)

Presenter: HOOK, Anson

Session Classification: Day 5

Contribution ID: **89** Type: **not specified**

Katherine Freese - Has JWST Discovered Dark Stars?

Friday, July 5, 2024 2:00 PM (30 minutes)

Presenter: FREESE, Katherine

Session Classification: Day 5

Contribution ID: **90** Type: **not specified**

Marco Selvi - Recent results in dark matter direct detection

Tuesday, July 2, 2024 9:15 AM (30 minutes)

Presenter: SELVI, Marco (Istituto Nazionale di Fisica Nucleare)

Session Classification: Day 2

Contribution ID: **91** Type: **not specified**

Luca Visinelli - H0 and cosmological tensions: overview of theory solutions

Friday, July 5, 2024 11:15 AM (30 minutes)

Presenter: Prof. VISINELLI, Luca (Shanghai Jiao Tong University)

Session Classification: Day 5

Contribution ID: **92** Type: **not specified**

Laura Lopez-Honorez - Cosmological probes of dark matter's energy injections

Tuesday, July 2, 2024 9:45 AM (30 minutes)

Presenter: LOPEZ-HONOREZ, Laura

Session Classification: Day 2

Contribution ID: **93** Type: **not specified**

The road ahead: Astroparticle physics - Dan Hooper

Friday, July 5, 2024 3:00 PM (45 minutes)

Presenter: HOOPER, Dan (Fermilab/University of Chicago)

Session Classification: The road ahead

Contribution ID: **94** Type: **not specified**

Marco Cirelli - Dark matter indirect detection

Tuesday, July 2, 2024 10:15 AM (30 minutes)

Presenter: CIRELLI, Marco (LPTHE CNRS Jussieu Paris)

Session Classification: Day 2

Contribution ID: **95** Type: **not specified**

Belen Gavela - New tests of ALP-fermion interactions

Thursday, July 4, 2024 9:15 AM (30 minutes)

Presenter: GAVELA, Belen (Universidad Autónoma de Madrid)

Session Classification: Day 4

Contribution ID: **96** Type: **not specified**

Giacomo Landini - Dark Matter in QCD-like theories with a theta vacuum

Thursday, July 4, 2024 10:00 AM (30 minutes)

Title of the Poster/Talk

Related Papers/Preprints

Presenter: LANDINI, giacomo (IFIC and Universidad de Valencia)

Session Classification: Day 4

Contribution ID: **97** Type: **not specified**

Sam Witte - Axions clouds around pulsars

Thursday, July 4, 2024 11:30 AM (30 minutes)

Presenter: WITTE, Sam

Session Classification: Day 4

Contribution ID: **98** Type: **not specified**

Jessica Turner - Gravitational waves from GUT and HEP

Wednesday, July 3, 2024 9:15 AM (30 minutes)

Presenter: TURNER, Jessica (Durham University)

Session Classification: Day 3

Contribution ID: **99** Type: **not specified**

Edoardo Vitagliano - Astrophysical transients and feebly-interacting particles

Thursday, July 4, 2024 12:00 PM (30 minutes)

Presenter: VITAGLIANO, Edoardo

Session Classification: Day 4

Contribution ID: **100** Type: **not specified**

Arsenii Titov - Strong CP and modular invariance

Thursday, July 4, 2024 2:30 PM (30 minutes)

Presenter: TITOV, Arsenii (University of Pisa and INFN)

Session Classification: Day 4

Contribution ID: **101** Type: **not specified**

Miguel Vanvlasselaer - Interaction between the plasma and the bubble during FOPTs

Wednesday, July 3, 2024 9:45 AM (30 minutes)

Presenter: VANVLASSELAER, Miguel (VUB)

Session Classification: Day 3

Contribution ID: **102** Type: **not specified**

Daniel Mayani - Technical Product Manager, DECTRIS Ltd, Switzerland

Thursday, July 4, 2024 3:00 PM (30 minutes)

Presenter: MAYANI, Daniel

Session Classification: Industry talk

Contribution ID: **103** Type: **not specified**

Bradley Kavanagh - Black holes inspirals: lessons for dark matter

Wednesday, July 3, 2024 10:15 AM (30 minutes)

Presenter: KAVANAGH, Bradley

Session Classification: Day 3

Contribution ID: **104** Type: **not specified**

Edward Hardy - Axion cosmology

Tuesday, July 2, 2024 11:15 AM (30 minutes)

Presenter: HARDY, Edward

Session Classification: Day 2

Contribution ID: **105** Type: **not specified**

Oleksii Matsedonskii - News on cosmological selections of the weak scale

Wednesday, July 3, 2024 11:15 AM (30 minutes)

Presenter: MATSEDONSKYI, Oleksii (TUM)

Session Classification: Day 3

Contribution ID: **106** Type: **not specified**

Marco Regis - Radio signals from axions

Tuesday, July 2, 2024 11:45 AM (30 minutes)

Presenter: REGIS, Marco (Istituto Nazionale di Fisica Nucleare)

Session Classification: Day 2

Contribution ID: **107** Type: **not specified**

Carlos Tamarit - Is there a strong CP problem?

Tuesday, July 2, 2024 2:00 PM (30 minutes)

Presenter: TAMARIT, Carlos (TUM)

Session Classification: Day 2

Contribution ID: **108** Type: **not specified**

GW signatures of domain walls

Wednesday, July 3, 2024 11:45 AM (30 minutes)

Title of the Poster/Talk

Related Papers/Preprints

Presenter: BLASI, Simone (DESY)

Session Classification: Day 3

Contribution ID: **109** Type: **not specified**

Alberto Ramos - The strong CP problem in the quantum rotor

Tuesday, July 2, 2024 2:30 PM (30 minutes)

Presenter: RAMOS, Alberto

Session Classification: Day 2

Contribution ID: **110** Type: **not specified**

Javi Serra - BSM at finite density

Wednesday, July 3, 2024 12:15 PM (30 minutes)

Presenter: SERRA, Javi (IFT UAM/CSIC)

Session Classification: Day 3

Contribution ID: **111** Type: **not specified**

Kirill Kanshin - Senior Machine Learning Engineer, Meta, USA

Thursday, July 4, 2024 3:30 PM (30 minutes)

Presenter: KANSHIN, Kirill

Session Classification: Industry talk

Contribution ID: **112** Type: **not specified**

Nassim Bozorgnia - Large magellanic cloud and dark matter direct searches

Thursday, July 4, 2024 4:30 PM (30 minutes)

Presenter: BOZORGNIA, Nassim (University of Alberta)

Session Classification: Day 4

Contribution ID: **113** Type: **not specified**

Ninetta Saviano - Primordial black holes and leptogenesis

Thursday, July 4, 2024 5:00 PM (30 minutes)

Presenter: SAVIANO, Ninetta (Istituto Nazionale di Fisica Nucleare)

Session Classification: Day 4

Contribution ID: **114** Type: **not specified**

Belina von Krosigk - Direct detection of sub-GeV dark matter: experimental status

Tuesday, July 2, 2024 4:00 PM (30 minutes)

Presenter: VON KROSIGK, Belina

Session Classification: Day 2

Contribution ID: **115** Type: **not specified**

Ninetta Saviano - Primordial black holes and leptogenesis

Presenter: SAVIANO, Ninetta (Istituto Nazionale di Fisica Nucleare)

Session Classification: Day 4

Contribution ID: **116** Type: **not specified**

Francesco Sergio - HIDDeN outreach in Durham

Thursday, July 4, 2024 5:30 PM (10 minutes)

Presenter: SERGIO, Francesco

Session Classification: Day 4

Contribution ID: **117** Type: **not specified**

Jeff Lazar - IceCube and KM3NeT results: high and low energy frontiers

Presenter: LAZAR, Jeffrey (Université Catholique de Louvain)

Session Classification: Day 2

Contribution ID: **118** Type: **not specified**

Elina Merkel - HIDDeN outreach in Bologna: the inVISIBILI project

Thursday, July 4, 2024 5:40 PM (10 minutes)

Presenter: MERKEL, Elina

Session Classification: Day 4

Contribution ID: **119** Type: **not specified**

Recent results from the IceCube neutrino observatory

Tuesday, July 2, 2024 5:00 PM (15 minutes)

Presenter: LAZAR, Jeffrey (Université Catholique de Louvain)

Session Classification: Day 2

Contribution ID: **120** Type: **not specified**

Recent results from KM3NeT

Tuesday, July 2, 2024 5:15 PM (15 minutes)

Presenter: LAZAR, Jeffrey (Université Catholique de Louvain)

Session Classification: Day 2

Contribution ID: **121** Type: **not specified**

ESR Day presentation

Presenter: GAVELA, Belen (Universidad Autónoma de Madrid)

Session Classification: Day 4

Contribution ID: **122** Type: **not specified**

Belen Gavela - ESR Day presentation

Thursday, July 4, 2024 9:45 AM (15 minutes)

Presenter: GAVELA, Belen (Universidad Autónoma de Madrid)

Session Classification: Belen Gavela - ESR Day presentation