AstroParticle Symposium 2022

Rapport sur les contributions

ID de Contribution: **1** Type: **Non spécifié**

Gravitational portal at the end of inflation

mercredi 2 novembre 2022 10:00 (20 minutes)

Orateur: CLERY, Simon

Classification de Session: Conference day

ID de Contribution: **2**   Type: **Non spécifié**

Cosmological tensions and possible connections with new physics

Orateur: Prof. LESGOURGUES, Julien (Aachen)

Classification de Session: Discussion

ID de Contribution: **3**   Type: **Non spécifié**

Cosmic shear: Going from stage-III to stage-IV

mercredi 9 novembre 2022 11:45 (45 minutes)

I will review the current state-of-the-art of cosmic shear surveys and the major ob- servational and theoretical systematics that need to be understood to attain robust cosmological results. Given the delays of the upcoming stage-IV surveys, I will give a near-term outlook on what can be expected from the established stage-III surveys in the next couple of years. The significant hurdles that need to be overcome for the next generation of surveys will be illustrated with Euclid as an example, advocating a big-picture approach that makes full use of ancilliary data from other experiments/observatories and different wavelengths.

Orateur: HILDEBRANDT, Hendrik

ID de Contribution: **4**   Type: **Non spécifié**

Large-Scale Structure Cosmology in the Systematics-Limited Regime

mercredi 9 novembre 2022 11:00 (45 minutes)

Over the next decade, large galaxy surveys will map billions of galaxies and probe cosmic structure formation with high statistical precision. This talk will outline opportunities and challenges of cosmological analyses in the presence of complex systematic effects using recent results from the Dark Energy Survey as pathfinder examples. In particular, I will describe dif- ferent cosmological probes measured from photometric data and summarize the recent progress on combining galaxy clustering, weak lensing, cluster clustering and cluster abundances, as well as constraints on baryons and galaxy biasing from small scales. I will conclude with an outlook on cosmology analysis plans and challenges for future, much larger experiments such as Rubin Observatory's LSST, Roman Space Telescope and overlapping Cosmic Microwave Background surveys.

Orateur: KRAUSE, Elisabeth

ID de Contribution: **5**
Type: **Non spécifié**

Galaxy Clustering Beyond the Power Spectrum

mercredi 9 novembre 2022 10:00 (1 heure)

The 2-point Correlation Function and its Fourier-space counterpart, the Power Spectrum play a major role in the analysis of spectroscopic galaxy surveys. Yet, they do not describe the full statistical properties of cosmological perturbations at low redshift, a highly non-Gaussian random field. Non-Gaussian properties are quantified by higher-order correlation functions such as the galaxy bispectrum, an observable measured and analysed already in the earliest data-sets, that is now enjoying a renewed interest as a way to more fully exploit the cosmological information in current galaxy surveys. I will briefly review the current state-of-the-art of the power spectrum and bispectrum theoretical modelling and data analysis before presenting what we expect for the future, with a specific attention to the preparation for the Euclid mission.

Orateur: SEFUSATTI, Emiliano (INAF - Osservatorio Astronomico di Trieste)

ID de Contribution: **6**   Type: **Non spécifié**

Cosmology with galaxy clusters

mercredi 9 novembre 2022 14:30 (45 minutes)

The concordance model LambdaCDM, which appeared in the late 1990's, has been extremely successful. The model has been confirmed by new and increasingly precise cosmological observations for more than 15 years. But since 2015, measurements from different probes show possible tensions between parameters. Clusters of galaxies contributed to the building of the model since the beginning and provided constraints that improved over time. They now have a key role to play in testing the cosmological model farther and in clarifying the possible tensions. I will review the current cosmological constraints from galaxy clusters, and highlight the challenges that they have to overcome to achieve precision equivalent to that of other probes. I will then talk about on-going and future cluster surveys. Finally, beyond the measurement of cosmological parameters, galaxy clusters constitute ideal laboratories to study structure formation in the Universe, another way to test the LambdaCDM model.

Orateur: MELIN, Jean-Baptiste

ID de Contribution: **7**   Type: **Non spécifié**

Fundamental Physics from the Unexplored Universe

jeudi 10 novembre 2022 10:00 (1 heure)

Cosmic voids –vast regions of relatively empty space that prevail throughout the Universe –may hold new clues to some long-standing problems in cosmology, yet they have largely been neglected as a cosmological probe by the scientific community until recently. The current and next generation of large-scale structure surveys for the first time enable a rigorous statistical treatment of voids and open up a new window for the exploration of fundamental physics on supergalactic scales. In my talk I will summarize recent progress in unlocking this potential with dedicated efforts to analyze voids in simulations and extensive data sets from redshift surveys and provide an outlook for future applications on how to scrutinize cosmology, gravity, and neutrino physics from this new angle.

Orateur: HAMAUS, Nico

ID de Contribution: **8**   Type: **Non spécifié**

21cm Intensity Mapping: opportunities and challenges on the road to the SKA Observatory

mercredi 9 novembre 2022 16:00 (1 heure)

Radio telescopes such as MeerKAT, and in the future the SKA Observatory, can map the spatial distribution of the post-reionization cosmic neutral hydrogen using Intensity Mapping techniques for the 21 cm line. These measurements can unveil the underlying large-scale structure of the Universe and contribute in a fundamental way to our understanding of structure growth. A key point is the subtraction of the bright foregrounds, orders of magnitude stronger than the 21cm signal. In this talk, I will briefly describe the status of MeerKLASS, an Intensity Mapping survey with the MeerKAT telescope. Moreover, I will report the results of an effort, led by the SKA Intensity Mapping Focus Group, to construct a realistic mock data cube with improved sky model and instrument characterization, and to assess through simulations the performance of foreground cleaning methods. I will discuss current limitations and the roadmap to the SKAO era.

Orateur: SPINELLI, Marta

ID de Contribution: **9**   Type: **Non spécifié**

More than the sum of its parts: joint analysis of LSS and CMB experiments

jeudi 10 novembre 2022 11:00 (1 heure)

Through weak lensing and galaxy clustering measurements, future large-scale galaxy surveys will provide unprecedented constraints on the late Universe. On the other hand, high-quality CMB observations (Planck and future CMB experiments) can – and already do – put tight constraints on the early Universe. In this talk, I will show that combining these two sources of cosmological information can yield a significant lever arm and improve tremendously the constraints on our cosmological model. Moreover, I will also address the cross-correlation of those two types of signals, which can yield additional and significant constraints especially on extensions to the standard cosmological model. As a part of my talk, I will present in particular forecasts of the future Euclid x CMB cross-correlation constraints, performed by the CMB-cross correlations Science Working Group of the Euclid Collaboration.

Orateur: ILIC, Stephane (IJCLab)

ID de Contribution: **10**

Type: **Non spécifié**

Cosmological Constraints from Galaxy Cluster Mass Profiles

mercredi 9 novembre 2022 15:15 (45 minutes)

Galaxy clusters are the large structures in the universe. Host in massive dark matter halos, they are the ultimate result of hierachical bottom-up process of cosmic structure formation. The non-linear gravitational collapse of matter which drives the mass assembly of galaxy cluster leaves a cosmological imprint on the abundance, spatial clustering and internal structure. Because of this, galaxy clusters can be considered as a laboratory of astrophysics and cosmology. In this talk I will rewiew how cosmological information gets imprinted on the mass profile of halos and how it can be retrieved through a non-parametric proxy of the mass distribution in galaxy clusters, such as to provide constraints on the cosmological parameters complementary to those of other cluster probes.

Orateur: CORASANITI, PierStefano

ID de Contribution: **11**   Type: **Non spécifié**

Cosmology from the South Pole Telescope

lundi 7 novembre 2022 14:30 (1 heure)

The Planck satellite has set a new frontier for cosmology, providing the most accurate measurements of cosmological parameters to date. It also left us with a number of new, interesting mysteries that might hint to the discovery of new physics. Current and upcoming CMB ground-based experiments will be able to explore these questions further, hopefully providing new insights into these problems. In this talk, I will review cosmological constraints from the first power spectrum measurements using SPT-3G, the third-generation receiver on the South Pole Telescope. I will present how the first SPT-3G results compare to the Planck and ACT constraints and I will present prospects for the future.

Orateurs: GUIDI, Federica; GALLI, Silvia (IAP)

ID de Contribution: **12**   Type: **Non spécifié**

Cosmic neutrinos and other relics: what remains to be learnt?

lundi 7 novembre 2022 15:30 (1 heure)

Cosmology has pioneered the investigation of neutrino properties and the discovery of yet-to-be-observed particles. Cosmological data point to the standard picture of three active, very light, weakly interacting neutrino families, and provide the tightest constraint to-date on the mass sum, complementary to laboratory avenues. The presence of additional light relic particles is also severely limited. Upcoming surveys promise to provide the first ever measurement of non/zero neutrino mass scale and rule out the existence of BSM thermal relics. Will we trust these results? In this talk, we will review the state of the art, discuss future prospects and reason about what cosmological analyses must do to convince the broader community of the robustness of cosmological findings.

Orateur: GERBINO, Martina

ID de Contribution: **13**   Type: **Non spécifié**

Dark matter production during preheating

mercredi 2 novembre 2022 10:20 (20 minutes)

Orateur: YOON, Jong Hyun

Classification de Session: Conference day

ID de Contribution: **14**   Type: **Non spécifié**

Searching for supersymmetric LLPs

mercredi 2 novembre 2022 10:40 (20 minutes)

Orateur: KPATCHA, Donald

Classification de Session: Conference day

ID de Contribution: **15**   Type: **Non spécifié**

Primordial Black Holes from Dissipation During Inflation

mercredi 2 novembre 2022 11:00 (20 minutes)

Orateur: GARCIA, Marcos

Classification de Session: Conference day

ID de Contribution: **16**   Type: **Non spécifié**

Non-perturbative gravitational production of vector Dark Matter

mercredi 2 novembre 2022 11:40 (20 minutes)

Orateur: Mlle SOCHA, Anna

Classification de Session: Conference day

ID de Contribution: **17**   Type: **Non spécifié**

Dark matter from the primordial plasma: from freeze-in to pandemic production

mercredi 2 novembre 2022 12:00 (20 minutes)

Orateur: M. BRINGMANN, Torsten

Classification de Session: Conference day

ID de Contribution: **18**   Type: **Non spécifié**

Observational signatures of compact dark stars

mercredi 2 novembre 2022 12:20 (20 minutes)

Orateur: M. IBARA, Alejandro

Classification de Session: Conference day

ID de Contribution: **19**   Type: **Non spécifié**

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Orateur: M. .., ..

Classification de Session: Conference day

ID de Contribution: **20**   Type: **Non spécifié**

Scalar production in the Early Universe

mercredi 2 novembre 2022 14:10 (20 minutes)

Orateur: M. LEBEDEV, Oleg

Classification de Session: Conference day

ID de Contribution: **21**   Type: **Non spécifié**

Unitarity in Higgs inflation and UV complete models

mercredi 2 novembre 2022 14:30 (20 minutes)

Orateur: M. LEE, Hyun Min

Classification de Session: Conference day

ID de Contribution: **22**   Type: **Non spécifié**

Reheating and dark matter freeze-in in the Higgs-R^2 inflation model

mercredi 2 novembre 2022 16:00 (20 minutes)

Orateur: Mlle MENKARA, Adriana

Classification de Session: Conference day

ID de Contribution: **23**   Type: **Non spécifié**

Long-lived particles and co-scattering

mercredi 2 novembre 2022 16:20 (20 minutes)

Orateur: Mme BELANGER, Genevieve

Classification de Session: Conference day

ID de Contribution: **24**   Type: **Non spécifié**

Dark matter and baryogenesis from freeze-in

mercredi 2 novembre 2022 16:40 (20 minutes)

Orateur: GOUDELIS, Andreas

Classification de Session: Conference day

ID de Contribution: **25**   Type: **Non spécifié**

Dark Matter beyond freeze-in

mercredi 2 novembre 2022 14:50 (20 minutes)

Orateur: RAMANAZOV, Sabir

Classification de Session: Conference day

ID de Contribution: **26**   Type: **Non spécifié**

Imprints of Mini Primordial Black Holes In Cosmological Data

mercredi 2 novembre 2022 15:10 (20 minutes)

Orateur: HEURTIER, Lucien

Classification de Session: Conference day

ID de Contribution: **27**   Type: **Non spécifié**

Dark Matter Production from Preheating and Structure Formation Constraints

mercredi 2 novembre 2022 17:00 (20 minutes)

Orateur: M. PIERRE, Mathias

Classification de Session: Conference day

ID de Contribution: **28**   Type: **Non spécifié**

Boltzmann or Bogoliubov? A Case of Gravitational Particle Production

mercredi 2 novembre 2022 12:40 (20 minutes)

Orateur: M. KANETA, Kunio

Classification de Session: Conference day

ID de Contribution: **29**   Type: **Non spécifié**

From standard to constrained cosmological simulations

jeudi 10 novembre 2022 14:30 (1 heure)

To understand dark matter and energy, large cosmological surveys are designed to reach a few percent precision. This large quantity of data needs to be analyzed in light of cosmological simulations, to be fully exploited. Such preliminary analyses brought out tensions between the standard cosmological model and observations. Reaching a 1% precision, systematics of the same order of magnitude, due to our cosmic environment, our survey specificities and our tool proper- ties, rise out. Analyses need to be fueled with a new type of cosmological simulations designed to reproduce our cosmic environment. Such simulations, that I named CLONES (Constrained LOcal & Nesting Environment Simulations), provide a robust methodological framework to min- imize the systematics. After presenting standard cosmological simulations, I will introduce the CLONES giving a few study examples that promise to tremendously increase our capacity to evade systematics in future survey analyses.

Orateur: SORCE, Jenny

ID de Contribution: 30   Type: **Non spécifié**

Constraining cosmology with the summer fields of the South Pole Telescope

The South Pole Telescope (SPT) is observing the CMB with arcminutes resolution, with its third generation camera (SPT-3G). One of the main goals is to improve the current constraints on cosmological parameters. During the first observing season, SPT-3G observed its baseline sky patch (1500 deg2), and obtained cosmological constraints consistent with those from the Planck mission. Deeper observations of the SPT-3G baseline field are currently ongoing, as well as observations of additional 3000 deg2 that are observed during the summer season (the "summer fields"). In this talk I will present the ongoing analysis of the SPT-3G summer fields, and forecasts of the cosmological parameters relying on the SPT-3G extended survey (baseline+summer fields). The inclusion of the SPT-3G summer fields in the combined analysis of the SPT-3G baseline field and Planck data is expected to improve the constraints by 20% for the LCDM model, and by up to 50% for LCDM extensions.

Orateur: GUIDI, Federica

ID de Contribution: **31**
Type: **Non spécifié**

Building the SPT-3G 2019/2020 Likelihood

mardi 8 novembre 2022 10:00 (15 minutes)

The South Pole Telescope (SPT) is observing the CMB anisotropies with arcminute resolution using its state-of-the-art camera (SPT-3G). Constraints on cosmological parameters from the obtained data will be as tight as Planck's one, while remaining independent from the satellite experiment, thus allowing to test the consistency of the two dataset and investigate new physics. A reliable estimation of cosmological parameters requires accurate covariance matrices. In this talk, I will present my recent work on analytical pseudo-power spectrum covariance matrices for small survey area. First, I will introduce an efficient (but computationally expensive) exact calculation of such matrices. Then, using it as a reference, I estimate the accuracy of existing and new approximations of the covariance matrix. Finally, I will present solutions to mitigate the effect of point source masking.

Orateur: CAMPHUIS, Etienne

ID de Contribution: **32**   Type: **Non spécifié**

Neutrino Oscillations: an Avenue to Probe the Universe

mardi 8 novembre 2022 10:15 (20 minutes)

We have reached an advanced stage in our understanding of the Universe, confirmed to a great extent by probes such as the Cosmic Microwave Background(CMB), Gravitational Waves(GW) and Large Scale Structure(LSS). However, there are a few phenomena that, even with these probes, are still mysterious. Particularly, the nature of Dark Energy(DE) and the Hubble Tension. In this talk, I will present the case for neutrino oscillations in curved spacetime as a potential new probe for these two phenomena. By showing how the neutrino oscillation probability is affected by DE models and different values of the Hubble parameter, these messengers might give us new insight on these two phenomena, and thus might ease the quest for their nature.

Orateur: KHALIFE, Ali Rida

ID de Contribution: **33**   Type: **Non spécifié**

Enabling hydrogen intensity mapping

mardi 8 novembre 2022 10:35 (20 minutes)

Neutral hydrogen 21-cm emission traces the Universe's large-scale structure. In par- ticular, if we relax the requirement of galaxy detection and integrate all radiation, we efficiently probe extensive areas, preserving the accurate distance information from the 21-cm line. This strategy is called Intensity Mapping (IM). IM is an emerging science field; many new or planned instruments can perform such surveys, such as the MeerKAT telescope, a precursor to SKAO. However, IM measurements face formidable challenges, and no direct detection has yet been per- formed. The main reason is that the foregrounds are orders of magnitude more intense than the signal, translating any possible tiny leakage due to the instruments'imperfections and calibration uncertainties into catastrophic contamination. I will discuss ways forward. On the one hand, we can use algorithms borrowed from signal processing to separate the cosmological signal effi- ciently. For example, within the MeerKLASS collaboration –which is conducting an IM survey at redshift less than 1.5 with MeerKAT, we started an effort to test and optimize the available foreground removal methods directly on data (e.g., PCA, FastICA, mixGMCA, GPR). I will show preliminary results. On the other hand, theoretical insights and adapted statistical methods can also help us retrieve the signal. In this respect, I'll present results showing how 2- and 3-point correlations of the signal alone or in cross-correlation with other probes can pin down the IM field. In perspective, these ongoing efforts are crucial for making IM experiments competitive for cosmology.

Orateur: CARUCCI, Isabella Paola

ID de Contribution: **34**   Type: **Non spécifié**

Constraining beyond ΛCDM models with 21cm intensity mapping forecast ob- servations combined with latest CMB data

mardi 8 novembre 2022 10:55 (15 minutes)

We explore constraints on dark energy and modified gravity with forecast 21cm inten- sity mapping measurements using the Effective Field Theory approach. We construct a realistic mock data set forecasting a low redshift 21cm signal power spectrum P21(k) measurement from the MeerKAT radio-telescope. We compute constraints on cosmological and model parameters through Monte Carlo Markov chain techniques, testing both the constraining power of P21(k) alone and its effect when combined with the latest Planck 2018 CMB data. We complement our anal- ysis by testing the effects of tomography from an ideal mock data set of observations in multiple redshift bins. We conduct our analysis numerically with the codes EFTCAMB/EFTCosmoMC, which we extend by implementing a likelihood module fully integrated with original codes. We find that adding P21(k) to CMB data provides significantly tighter constraints on $\Omega_c h^2$ and H0, with a reduction of the error with respect to Planck results at the level of more than 60%. For the parameters describing beyond ΛCDM theories, we observe a reduction in the error with respect to the Planck constraints at the level of less than 10%. The improvement increases up to almost 35% when we constrain the parameters using ideal, tomographic mock observations. We conclude that the power spectrum of the 21cm signal is sensitive to variations of the parameters describing the examined beyond ΛCDM models and, thus, P21(k) observations could help to constrain dark energy. The constraining power on such theories is improved significantly by tomography.

Orateur: BERTI, Maria

ID de Contribution: **35**   Type: **Non spécifié**

Cosmology with Fast Radio Bursts - New constraints on the Hubble constant

mardi 8 novembre 2022 11:10 (25 minutes)

Fast radio bursts (FRBs) are very short and bright transients visible over extragalactic distances. The radio pulse undergoes dispersion caused by free electrons along the line of sight, most of which are associated with the large-scale structure. The total dispersion measure therefore increases with the line of sight and provides a distance estimate to the source. In my talk, I will discuss the exciting possibilities to use FRBs for cosmology. As an application, I will present the first measurement of the Hubble constant using the dispersion measure-redshift relation of radio bursts with identified host counterpart and corresponding redshift information and discuss the future prospects of FRBs for determining the cosmic expansion rate.

Orateur: HAGSTOTZ, Steffen

ID de Contribution: **36**   Type: **Non spécifié**

Fundamental physics and Cosmology with Fast Radio Bursts

mardi 8 novembre 2022 11:35 (20 minutes)

Fast Radio Bursts (FRBs) are short transients lasting typically a few milliseconds. The pulse experience a dispersion due to scattering from free electrons along the line-of-sight, hence measuring the integrated electron density, the Dispersion Measure (DM). Since FRBs are visible over cosmological distances their statistic can be used to probe the distribution of the electron distribution in the Universe. In this talk I will show how DM statistics can be used to test the equivalence principle and how it can turn into a key calibration ingredient for upcoming cosmological surveys such as EUCLID or Rubin-LSST.

Orateur: REISCHKE, Robert

ID de Contribution: **37** Type: **Non spécifié**

FLASH TALKS + Discussion

mardi 8 novembre 2022 11:55 (35 minutes)

ID de Contribution: **38**   Type: **Non spécifié**

Nonlinear Structure and Linear Dynamics of Voids

mardi 8 novembre 2022 14:00 (15 minutes)

Using state-of-the-art hydrodynamical simulations to identify voids, I will discuss their fundamental properties across different resolutions in mass and scale, such as the spatial distribu- tion of halos and cold dark matter via their density profiles. Furthermore, I will present different estimators for calculating the average radial motion of tracers around these voids and test the validity of the linearized continuity equation in and around these underdense environments. This provides a direct connection between the density profiles of voids and their velocity profiles, which will be of relevance in current and future cosmological experiments.

Orateur: SCHUSTER, Nico

ID de Contribution: **39**   Type: **Non spécifié**

Cluster cosmology with Dark Energy Survey

mardi 8 novembre 2022 14:15 (20 minutes)

Galaxy clusters have long proven to be a valuable cosmological tool: arising from the highest peaks of the matter density field, they are a sensitive probe of the growth of structures and cosmic expansion. Current and upcoming wide-area photometric surveys —e.g. the Dark- Energy Survey (DES), the Hyper Suprime-Cam Subaru Strategic Program, the Large Synoptic Survey Telescope, Euclid —seek to use the abundance and spatial distribution of galaxy clusters to improve constraints on the dark energy and the late-time normalization of the matter power spectrum. One of the main limitation for the exploitation of such a large dataset is our capabil- ity of recovering unbiased cluster mass estimates from observable mass proxies; a task especially challenging in case of optically selected clusters. In this talk I will review the work I have been carrying out in the last few years aimed at the characterization and analysis of the DES photo- metric cluster catalogs, with focus on the systematics affecting optical cluster catalogs and the opportunities and challenges for the exploitation of forthcoming photometric cluster surveys.

Orateur: COSTANZI, Matteo

ID de Contribution: **40**　　　　　　　　　　　　　　　Type: **Non spécifié**

Cluster Cosmology with the South Pole Telescope and the Dark Energy Survey

mardi 8 novembre 2022 14:35 (20 minutes)

The abundance of massive halos (and of the galaxy clusters they host) has long been recognized as an extremely promising probe of the large-scale structure of the universe. Over the past decade, tremendous progress was made, notably thanks to the availability of high-resolution surveys of the Cosmic Microwave Background (CMB), of high-quality measurements of gravita- tional lensing, and of advanced numerical simulations. The sample of galaxy clusters selected by the South Pole Telescope (SPT, combining the SPT-SZ and SPTpol surveys) in the CMB now exceeds a thousand objects. The weak-lensing based mass calibration using Dark Energy Survey (DES) Year 3 data will be better than 5%. The joint analysis of the cluster abundance and weak-lensing mass calibration is therefore expected to provide significantly tighter cosmological constraints than the current state of the art. In my talk, I will review the SPT cluster cosmology and mass calibration program. I will focus on the almost completed weak-lensing analysis using DES Year 3 data and highlight the current status of the ongoing cosmological analysis. Look- ing further ahead, I will discuss the potential of CMB lensing for cluster mass calibration with SPT-3G and CMB-S4, synergies with optical wide-field surveys, and the central role of numerical simulations to understand the dynamics of non-linear structure formation.

Orateur:　BOCQUET, Sebastian

ID de Contribution: **41**   Type: **Non spécifié**

Halo Sparsity: A Swiss army knife for galaxy cluster astrophysics and cosmology

mardi 8 novembre 2022 14:55 (15 minutes)

Halo sparsity, the ratio of two masses of a dark matter halo measured at two different overdensities, has proven itself to be a promising avenue to probe cosmology using the internal structure of dark matter haloes. In this talk I will present multiple applications of halo sparsity beyond current cosmological constraints. Most notably I will show how sparsity correlates with the dynamical state of a halo and can be used to detect haloes undergoing major mergers. In addition I will present how sparsity can also be used to express the halo mass function at different overdensity contrasts and how it's non parametric nature allows it to unify previous models for the internal structure of dark matter haloes into a single formalism.

Orateur: RICHARDSON, Tamara (LUTH - Observatoire de Paris | PSL)

ID de Contribution: **42**   Type: **Non spécifié**

Studying the impact of galaxy cluster morphologies on their detection through SZ effect

mardi 8 novembre 2022 15:10 (10 minutes)

In any cosmological analysis based on the galaxy cluster number count, a very important ingredient is the selection function of the detection method used to produce the galaxy cluster catalog. Indeed, an incorrect determination of this function can lead to biases in the cosmological parameters estimated from the data. In this work we aim to study the possible impact of complex cluster morphology on the selection function of the multi-frequency matched filtering (MMF) algorithm, used to detect galaxy clusters through the Sunyaev-Zel'dovich (SZ) effect. For the determination of the selection function, we apply the same method as in Planck Collaboration XXVII (2015), using mock cluster images from hydrodynamical simulations injected in the Planck high frequency maps. We compare these results with the analytical form of the completeness derived from assuming gaussian noise, and with the same method of injection/detection using spherical clusters generated from a generalised NFW profile.

Orateur: GALLO, Stefano

ID de Contribution: **43**   Type: **Non spécifié**

Cosmology with galaxy clustering: a joint analysis of the power spectrum and bispectrum

mardi 8 novembre 2022 15:40 (20 minutes)

Future generations of galaxy redshift surveys will sample the large-scale structure of the Universe over unprecedented volumes with high-density tracers, allowing for precise measurements of the clustering statistics. In order to properly exploit the full potential of such data, a robust likelihood pipeline is required, starting with an accurate theoretical prediction of cosmological ob- servables, down to constraints on cosmological parameters. The main probe used in the context of spectro-scopic galaxy surveys is the two point correlation function, or its Fourier transform, the power spectrum. However, it has been shown that the inclusion of higher order correlation func- tions in the analysis can significantly improve the accuracy with which cosmological parameters are measured. I will present a software for the joint likelihood analysis of the galaxy power spec-trum and bispectrum, and describe its validation against a large set of N-body simulations that allows to assess possible systematics in the theoretical model. Moreover, I will present forecasts for the joint analysis of power spectrum and bispectrum for future stage-IV galaxy surveys, both for the standard model and beyond-LCDM models.

Orateur: MORETTI, Chiara

ID de Contribution: **44**   Type: **Non spécifié**

Bispectrum and finite volume effects: window convolution

mardi 8 novembre 2022 16:00 (15 minutes)

One particular class of observables to study galaxy clustering are Fourier-space summary statistics of the galaxy distribution. The higher order statistics such as the galaxy bispectrum offers non-trivial information with respect to the power spectrum, and in particular can directly probe a primordial non-Gaussian component, possibly shedding light on the interactions taking place during inflation. Including analysis of higher-order statistics however, comes with extra modelling complexity. In this talk, I will focus on the challenge to properly model the effects of the survey window in the bispectrum. Finite volume effects like this is especially important in order to get an unbiased measurements of parameters sensitive to large-scale information, e.g. fNL. In fact, the conventional FKP (Feldman-Kaiser-Peacock)-like estimator used to measure bispectrum provides as output a non trivial convolution between the underlying bispectrum with the window function. This effect should then be included in the theoretical prediction resulting in a 6-dimensional integral that needs to be evaluated in fast way so that it can be implemented in a likelihood analysis. First, I will illustrate our effort to provide a full analysis pipeline for the combined power spectrum and bispectrum measurements [arXiv: 2204.13628]. Then, I will present an exact and efficient method to perform the bispectrum-window convolution via Hankel transform [arXiv: 2203.04174] and conclude with possible applications and future directions.

Orateur: PARDEDE, Kevin

ID de Contribution: **45** Type: **Non spécifié**

Accounting for theoretical uncertainties in LSS analyses

mardi 8 novembre 2022 16:15 (20 minutes)

Current and future large-scale structure surveys increasingly push to smaller scales with improved precision. This poses challenges, as non-linear structure formation is not perfectly understood and modern cosmological simulations and methods derived from them, such as emula- tors and tuned halo model approaches, do not perfectly agree. As experimental precision and the statistical samples from surveys increase to the point where such discrepancies become relevant, it will lead to biases in cosmological parameter inference unless these theoretical uncertainties are taken into account. I illustrate a proof-of-concept solution for mitigating biases due to theoretical uncertainties for a mission like Euclid, with only a small degradation in parameter sensitivity.

Orateur: BRINCKMANN, Thejs

ID de Contribution: **46**   Type: **Non spécifié**

The halo model with beyond-linear halo bias: unbiasing cosmological con- straints from galaxy– galaxy lensing and clustering

The halo model is a phenomenological model often used to interpret the large-scale structure of the Universe. In this model all dark matter exists within dark matter halos, which trace the underlying matter fluctuations. In its most generic form it includes a number of approx- imations such as dark matter halos are spherical and can be completely described by their mass, and that the halos trace the underlying matter fluctuations in a linearly biased way –linear halo bias. These assumptions have provided a useful description of large-scale structure observables until now, but with ever improving datasets need to be revisited. In this talk I will present the error introduced in a joint halo model analysis of galaxy-galaxy lensing and galaxy clustering observables when adopting the standard approximation of linear halo bias. I will discuss how we include beyond-linear halo bias, compare to an alternative approach, and show that the di- rection of the sizable offsets depends on the freedom afforded to the halo model through other nuisance parameters. Finally, I will conclude that beyond-linear halo bias must be included in future cosmological halo model analyses of large-scale structure observables on non-linear scales.

Orateur: MAHONY, Constance

ID de Contribution: **47**   Type: **Non spécifié**

Redshift Calibration for Weak Lensing Surveys

mardi 8 novembre 2022 16:35 (15 minutes)

Cosmic shear measures the (dark) matter distribution of the Universe through the weak gravitational lensing of large samples of galaxies. To probe the statistical properties of the large scale structure and estimate cosmological parameters like the dark matter density parameter, we use deep and wide optical imaging surveys. One crucial ingredient for the statistical analyses is the redshift distribution of the weak lensing sources. I will present established methods to calibrate such redshift distributions from imaging data.

Orateur: WITTJE, Anna

ID de Contribution: **48**   Type: **Non spécifié**

FLASH TALKS + Discussion

mardi 8 novembre 2022 16:50 (40 minutes)

ID de Contribution: **49**   Type: **Non spécifié**

Welcoming address

mercredi 2 novembre 2022 09:30 (15 minutes)

Orateur: Mme SUOMIJÄRVI, Tiina (P2I - Graduate School of Physics)

Classification de Session: Conference day

ID de Contribution: **50**   Type: **Non spécifié**

The Pascal Institute

mercredi 2 novembre 2022 09:45 (15 minutes)

Orateur: M. BALKANSKI, Yves

Classification de Session: Conference day

ID de Contribution: **52**   Type: **Non spécifié**

Discussion (Inflation, preheating, reheating : codes and signature(s)?)

lundi 31 octobre 2022 15:00 (2 heures)

Orateurs: YOON, Jong Hyun; GARCIA, Marcos

Classification de Session: Discussion

ID de Contribution: **53** Type: **Non spécifié**

Colloquium (Testing Superstring Theory with Cosmological Observations)

jeudi 3 novembre 2022 11:00 (1 heure)

Orateur: BRANDENBERGER, Robert

Classification de Session: Colloquium

ID de Contribution: **54**   Type: **Non spécifié**

Discussion (Precision and Accurate Cosmology with Euclid : What Awaits Us.)

jeudi 3 novembre 2022 14:00 (2 heures)

Orateur: SILVESTRI, Alessandra

Classification de Session: Discussion

ID de Contribution: **55**   Type: **Non spécifié**

Discussion (The meaning of "gravitational production")

vendredi 4 novembre 2022 11:00 (1h 30m)

Orateurs: GRZADKOWSKI, Bohdan; KANETA, Kunio; LEBEDEV, Oleg

Classification de Session: Discussion

ID de Contribution: **56**   Type: **Non spécifié**

20 years of INTEGRAL

mardi 15 novembre 2022 14:30 (30 minutes)

Orateur: LAURENT, Philippe

Classification de Session: Conference day

ID de Contribution: **57**   Type: **Non spécifié**

The GRINTA mission for the next decade exploitation of the multimessenger sky

mardi 15 novembre 2022 15:00 (30 minutes)

The Gamma-Ray International Transient Array observatory (GRINTA) is a fast class mission designed to be a major breakthrough in the next decade (>2030) time domain astronomy, in particular for the multi-messenger domain. Transient signals from sources of gamma-ray bursts, gravitational waves and high energy neutrinos are known to produce hard X-rays that can be detected by an instrument with fast repointing capability and high sensitivity. The GRINTA S/C is designed to fly in a nearly equatorial Low Earth Orbit. It will implement a ~8 steradian FoV soft gamma-ray detector, paired to a highly sensitive hard X-ray imager. Its design and operational concept take full advantage of the heritage of the Swift and INTEGRAL missions in terms of rapid follow-up and survey capability.

Orateur: NATALUCCI, Lorenzo

Classification de Session: Conference day

ID de Contribution: **58**   Type: **Non spécifié**

Fast astrophysical multi-messenger astrophysics with DWF

mardi 15 novembre 2022 14:00 (30 minutes)

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The Deeper Wider Fast Programme (DWF) aims to discover and rapidly follow up the fastest bursts in the Universe (those lasting only milliseconds to hours). For this, we execute a main strategy comprised of coordinated international multi-facility, all-wavelength, and multi-messenger telescope observing runs to detect and follow up fast transient events.
I will present the challenges, opportunities, and preliminary results of the DWF main strategy for a variety of fast transients such as FRBs, GRBs and KNe. I will then discuss alternative strategies such as fast follow-up triggering, search for orphan and coincident multi-messenger transients.
Drücken Sie zum Aktivieren des Screenreaders ⬚+Wahltaste+Z. Informationen zu Tastaturkürzeln erhalten Sie, indem Sie ⬚Schrägstrich drücken.

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Orateur: MÖLLER, Anais (Swinburne University)

Classification de Session: Conference day

ID de Contribution: **59**   Type: **Non spécifié**

Lessons learned from multi-messenger models of active galaxies

mardi 15 novembre 2022 11:00 (30 minutes)

Evidence is pointing more and more clearly to blazars and other active galaxies as significant multi-messenger sources.
In this talk I summarize some of the latest developments in the modeling of cosmic-ray interactions in blazars and how these models can explain recent associations between IceCube events and individual sources. I also discuss the predicted flare signatures across the electromagnetic spectrum and the implications for neutrino source searches with the next generation of multi-wavelength experiments.

Orateur: RODRIGUEZ, Xavier

Classification de Session: Conference day

ID de Contribution: **60**   Type: **Non spécifié**

Teieresias Radiative Transfer: Consistently modelling the Kilonova Afterglow with Relativistic Hydrodynamics.

mardi 15 novembre 2022 11:30 (30 minutes)

The kilonova afterglow is the final phase of the electromagnetic counterpart to a BNS/NSBH merger, and it is the only predicted counterpart of GW170817, which has not been observed yet. The kilonova afterglow lightcurve is dependent on the mass, velocity and angular distributions of the ejecta, and thus represents an opportunity to independently constrain these properties. We present Teiresias Radiative Transfer: a complete relativistic, hydrodynamic, kilonova afterglow model for synchrotron radiation. This open source radiative transfer code predicts afterglow lightcurves for arbitrary ejecta profiles using 1-D relativistic hydrodynamic simulations from the Black Hole Accretion Code as an input. We demonstrate that this code is able to consistently model synchrotron radiation both in the optically thick and thin cases, at arbitrary frequency, and discuss the underlying assumptions and tools common to all afterglow models. Finally, we give predictions for the future development of GW170817.

Orateur: VAN WOERKOM, Ethan

Classification de Session: Conference day

ID de Contribution: **61**   Type: **Non spécifié**

General Coordinates Network (GCN): NASA's Next Generation Time-Domain and Multimessenger Astronomy Alert System

mardi 15 novembre 2022 16:00 (30 minutes)

The Gamma-ray Coordinates Network (GCN) is a public collaboration platform run by NASA for the astronomy research community to share alerts and rapid communications about high-energy, multimessenger, and transient phenomena. Over the past 30 years, GCN has helped enable many seminal advances by disseminating observations, quantitative near-term predictions, requests for follow-up observations, and observing plans. GCN distributes alerts between space- and ground-based observatories, physics experiments, and thousands of astronomers around the world. With new transient instruments from across the electromagnetic spectrum and multimessenger facilities, this coordination effort is more important and complex than ever. We introduce the General Coordinates Network, the modern evolution of GCN built on modern, open-source, reliable, and secure alert distribution technologies, and deployed in the cloud. The new GCN is based on Apache Kafka, the same alert streaming technology that has been selected by the Vera C. Rubin observatory. In this talk, we will present the status and design of the new GCN, a tutorial on how to stream alerts, and a vision of its growth as a community resource in the future.

Orateur: SINGER, Leo

Classification de Session: Conference day

ID de Contribution: **62**   Type: **Non spécifié**

Multi-Messenger studies: From ideas to realization

mardi 15 novembre 2022 12:00 (30 minutes)

I will use the recently observed association between extragalactic neutrinos and tidal disruption events as a starting point for an exploration of the tools needed to go from a scientific hypothesis to an active, high throughput time-domain program. I will introduce some of the concepts built into the AMPEL platform which were designed to make this possible.

Orateur: NORDIN, Jakob

Classification de Session: Conference day

ID de Contribution: **63**   Type: **Non spécifié**

The H.E.S.S transients follow-up system

mardi 15 novembre 2022 16:30 (30 minutes)

Orateur: ASHKAR, Halim (CNRS - Ecole Polytechnique - LLR)

Classification de Session: Conference day

ID de Contribution: **64**   Type: **Non spécifié**

GRB observations with IACTs

mardi 15 novembre 2022 17:00 (30 minutes)

In the last few years, very-high-energy (>100 GeV) emission from gamma-ray bursts (GRBs) has been detected for the first time, allowing us to build a multiwavelength picture of GRBs that extends all the way up to TeV energies. Now that we've detected a few GRBs, the question becomes: What's next? In this talk, I will describe the GRB programs of the current generation of air Cherenkov telescopes and the context in the multiwavelength community.

Orateur: ZHU, Sylvia (DESY)

Classification de Session: Conference day

ID de Contribution: **65**   Type: **Non spécifié**

Astro-COLIBRI in practice

mardi 15 novembre 2022 17:30 (30 minutes)

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The study of flaring astrophysical events in the multi-messenger approach requires instantaneous follow-up observations to better understand the nature of these events through complementary observational data. We present Astro-COLIBRI as a meta platform for the patchwork of different specific tools in the real-time multi-messenger ecosystem. The Astro-COLIBRI platform bundles and evaluates alerts about transients from various channels and further automates the coordination of follow-up observations by providing and linking detailed information through its comprehensible graphical user interface. We present the functionalities using documented examples of the Astro-COLIBRI usage through the community since its release in August 2021.
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Orateur: REICHHERZER, Patrick (Ruhr-Universität Bochum (RUB))

Classification de Session: Conference day

ID de Contribution: **66** Type: **Non spécifié**

Cosmology with Fast Radio Bursts

mardi 15 novembre 2022 10:30 (30 minutes)

Orateurs: REISCHKE, Robert; HAGSTOTZ, Steffen

Classification de Session: Conference day

ID de Contribution: **67**   Type: **Non spécifié**

Gamma-ray format GADF

mardi 22 novembre 2022 15:00 (20 minutes)

Orateur: LINHOFF, Maximilian (Department of Physics, TU Dortmund University)

Classification de Session: Discussion

ID de Contribution: **68**   Type: **Non spécifié**

VODF format: evolution and path forward

mardi 22 novembre 2022 15:20 (20 minutes)

Orateur: KOSACK, Karl (CEA Paris-Saclay, IRFU/DAp)

Classification de Session: Discussion

ID de Contribution: **69**   Type: **Non spécifié**

HAWC DL3 format

mardi 22 novembre 2022 15:40 (20 minutes)

Classification de Session: Discussion

ID de Contribution: **70**   Type: **Non spécifié**

Road map discussion

mardi 22 novembre 2022 16:00 (1 heure)

Classification de Session: Discussion

ID de Contribution: **71**   Type: **Non spécifié**

Model & interface

mercredi 23 novembre 2022 14:30 (2 heures)

State of the art for models : astromodel, astropy.modeling, sherpa, Xspec,
What models are needed for a MWL/MM MWL/MM.
How to guarantee model sustainability (eg: Naima, Xspec)

Orateur: Dr ACERO, Fabio (AIM, CEA, CNRS, Universite Paris-Saclay, Universite Paris)

Classification de Session: Discussion

ID de Contribution: **72**　　　　　　　　　　　　　　　　　　　Type: **Non spécifié**

Implementation of X/gamma-ray joint fit in gammapy

jeudi 24 novembre 2022 14:30 (30 minutes)

Orateur:　GIUNTI, Luca

Classification de Session:　Discussion

ID de Contribution: **73** Type: **Non spécifié**

How to handle MWL & multi-instrument fit in with gammapy

jeudi 24 novembre 2022 15:00 (30 minutes)

Orateur: ACERO, Fabio (AIM, CEA, CNRS, Universite Paris-Saclay, Universite Paris)

Classification de Session: Discussion

ID de Contribution: **74**   Type: **Non spécifié**

Multi-messenger Gamma/neutrinos analysis

Classification de Session: Discussion

ID de Contribution: **75**	Type: **Non spécifié**

Paleo-detectors - Introduction and motivations

mardi 22 novembre 2022 11:00 (1 heure)

Orateur:	CACCIANIGA, Lorenzo (Istituto Nazionale di Fisica Nucleare - Sezione di Milano)

Classification de Session:	Discussion

ID de Contribution: **76**   Type: **Non spécifié**

Paleo-detectors - the ideal mineral

mardi 22 novembre 2022 12:00 (1 heure)

Orateur: GALELLI, Claudio (UNIMI)

Classification de Session: Discussion

ID de Contribution: **77**   Type: **Non spécifié**

The EOSC multi-wavelength analysis prototype (MAP) for black hole models

Orateur: M. LLOYD, Sheridan

Classification de Session: Conference day

ID de Contribution: **78**   Type: **Non spécifié**

Numerical local source modeling of active galactic nuclei

jeudi 24 novembre 2022 10:30 (15 minutes)

Orateur: SCHLEGEL, Leander (Ruhr-Universität Bochum)

Classification de Session: Conference day

ID de Contribution: **79**   Type: **Non spécifié**

Constraining cosmic-ray sources with efficient propagation models

jeudi 24 novembre 2022 10:45 (15 minutes)

Orateur: M. RODRIGUES, Xavier

Classification de Session: Conference day

ID de Contribution: **80**   Type: **Non spécifié**

Horizon of UHECRs in galaxy clusters

jeudi 24 novembre 2022 11:00 (15 minutes)

Orateur: CONDORELLI, Antonio (IJCLAB)

Classification de Session: Conference day

ID de Contribution: **81**　　　　　　　　　　　　　　　　Type: **Non spécifié**

Constraining transient sources of UHECRs with arrival directions

jeudi 24 novembre 2022 11:15 (15 minutes)

Orateur:　MARAFICO, Sullivan

Classification de Session:　Conference day

ID de Contribution: **82**   Type: **Non spécifié**

Indications of the Gerasimova-Zatsepin effect in the Auger scalers data

jeudi 24 novembre 2022 11:30 (15 minutes)

Orateur: M. SCHIMASSEK, Martin (IJCLab)

Classification de Session: Conference day

ID de Contribution: **83**   Type: **Non spécifié**

450 years of de nova stella - Tycho's supernova

jeudi 24 novembre 2022 11:45 (15 minutes)

Orateur: Dr ACERO, Fabio (AIM, CEA, CNRS, Universite Paris-Saclay, Universite Paris)

Classification de Session: Conference day

ID de Contribution: **84**   Type: **Non spécifié**

Flares associated with the synchrotron emission from the Crab pulsar wind nebula

jeudi 24 novembre 2022 12:00 (15 minutes)

Orateur: TSIROU, Michelle (DESY)

Classification de Session: Conference day

ID de Contribution: **85**   Type: **Non spécifié**

Discussion session on Alerts, formats and protocols

vendredi 18 novembre 2022 10:30 (1h 30m)

Orateurs: NEBOT, Ada; SINGER, Leo (NASA Goddard Space Flight Center)

Classification de Session: Discussion

ID de Contribution: **86**   Type: **Non spécifié**

STeVeCAT

jeudi 24 novembre 2022 12:15 (15 minutes)

Orateur: GREAUX, Lucas

Classification de Session: Conference day

ID de Contribution: **87**   Type: **Non spécifié**

Placehoder

jeudi 24 novembre 2022 12:30 (15 minutes)

Orateur: BUSON, Sara (Univ. of Wuerzburg)

Classification de Session: Conference day

ID de Contribution: **88**   Type: **Non spécifié**

Placeholder

Classification de Session: Conference day

ID de Contribution: **89**   Type: **Non spécifié**

Atmospheric electricity

mercredi 23 novembre 2022 11:00 (2 heures)

Orateurs: COLALILLO, Roberta (INFN – Napoli); MUSSA, Roberto (INFN – Torino)

Classification de Session: Discussion