中微子及相关新物理研讨会 (NuPhyR)

Report of Contributions

https://indico.ihep.ac.cn/e/26922

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

Double Beta Decay as a Probe of New Physics

Sunday, 30 November 2025 09:00 (30 minutes)

The study of nuclear double beta decay provides a uniquely sensitive window into physics beyond the Standard Model. While the two-neutrino mode, a rare second-order weak process, has been observed in several isotopes, the search for the neutrinoless mode remains a paramount objective in particle and nuclear physics. The observation of this decay would be a landmark discovery, as it violates total lepton number conservation and would definitively establish that neutrinos are Majorana particles. This talk will review the profound theoretical motivations for searching for double beta decay. Beyond the standard mass mechanism where light, active Majorana neutrinos are responsible for the decay, I will also explore how these searches constrain other Beyond-the-Standard-Model scenarios, such as non-standard neutrino interactions, sterile neutrinos, Majorons and other dark sector particles coupling to neutrinos. Here, I will highlight the importance of the measured two-neutrino mode, solidifying the role of double beta decay as a powerful and essential probe of New Physics.

Primary author: DEPPISCH, Frank (University College London)

Presenter: DEPPISCH, Frank (University College London)

Session Classification: 会议报告 / Workshop Seminars

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

射电探测超高能中微子的下一代方案的比较与优化

Sunday, 30 November 2025 16:00 (25 minutes)

射电探测具备其它类型探测器的大部分优点，且单个造价低廉，适合大规模铺设，被认为是研究超高能粒子的理想的下一代探测技术。截至目前为止，国际上已经提出地面或高山铺设，气球和卫星搭载，月基铺设等多种探测方案。国内截至目前为止，仅一个地面铺设方案在研。本报告将探讨这些探测方案的优劣，目的是找到一个性价比高（投入较少，灵敏度高），并能与其它技术组成联合观测的实验方案。

Primary author: ZHANG, Chao (南京大学)

Presenter: ZHANG, Chao (南京大学)

Session Classification: 会议报告 / Workshop Seminars

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

Diagnosing the AGN population origin of TeV neutrinos with their spatial correlation

Saturday, 29 November 2025 16:00 (10 minutes)

The recent IceCube detection of TeV neutrinos from the nearby Seyfert galaxy NGC˜1068 suggests that active galactic nuclei (AGN) could make a significant contribution to the diffuse flux of astrophysical neutrinos.
The absence of TeV gamma-rays from NGC˜1068 indicates neutrino production in
the vicinity of the supermassive black hole, such as disk-corona, where the high radiation density leads to efficient neutrino production and severe gamma-ray attenuation. Disk-corona models predict that the neutrino emission from AGNs correlates
with X-ray emission, which traces the coronal activity.
In this paper, we assess whether the X-ray AGN population origin for TeV neutrinos can be tested by using the spatial correlation between the neutrino population and X-ray AGN population with future neutrino telescopes.
By performing simulations, we find that, for $100 - 300$˜TeV diffuse neutrino flux, the AGN origin can be tested at a confidence level of $\sim 3\sigma$ with five-year observations of IceCube-Gen2, which has an angular resolution of $0.1 - 0.2$ degree. With better angular resolution and sensitivity in the 100-300 TeV energy range, a 30 km^3 undersea
neutrino telescope (e.g., HUNT) is expected to reach a significance of $\sim 5\sigma$ in testing the association after three years of exposure.

Primary authors: 陈, 晓斌 (Nanjing University); 王, 祥玉 (南京大学); 柳, 若愚 (Nanjing University)

Presenter: 陈, 晓斌 (Nanjing University)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

Charged-current (anti)neutrino scattering cross sections and radiative corrections

Sunday, 30 November 2025 14:25 (25 minutes)

Charged-current quasielastic neutrino scattering is the signal process in neutrino oscillation experiments and requires precise theoretical prediction for the analysis of modern and future experimental data, starting with the nucleon vector and axial-vector coupling constants and axial-vector form factor at higher energies. In this talk, I compare a new MINERvA measurement of this form factor with lattice-QCD calculations and deuterium bubble- chamber data, provide uncertainty projections for future extractions, present recent calculations of radiative corrections to charged-current processes, and investigate the potential of neutrino scattering data on constraining nucleon- and quark-level interactions beyond the Standard Model.

Primary author: TOMALAK, Oleksandr (Institute of Theoretical Physics, Chinese Academy of Sciences)

Presenter: TOMALAK, Oleksandr (Institute of Theoretical Physics, Chinese Academy of Sciences)

Session Classification: 会议报告 / Workshop Seminars

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

Overview of collider neutrinos

Sunday, 30 November 2025 14:00 (25 minutes)

Collider neutrinos open a new window into high-energy neutrino interactions and forward physics at hadron colliders. In this talk, I will first outline the motivation for studying collider neutrinos and introduce the LHC experiments FASERν and SND@LHC. I will then discuss the production and detection of collider neutrinos, along with estimates of their fluxes and interaction rates at FASER\nu$. Recent experimental milestones—including the first observation of collider neutrinos, the first cross-section measurements, and the first flux determinations—will be highlighted. I will show how these results can constrain proton parton distribution functions and test hadronic interaction models relevant to astroparticle physics. Possible implications for physics beyond the Standard Model and prospects at future facilities such as the FCC-hh and muon colliders will also be briefly discussed.

Primary author: WANG (王), Zeren Simon (泽人) (Hefei University of Technology)

Presenter: WANG (王), Zeren Simon (泽人) (Hefei University of Technology)

Session Classification: 会议报告 / Workshop Seminars

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

Recent progress on Leptogenesis

Saturday, 29 November 2025 11:35 (25 minutes)

Many Baryogenesis mechanisms have been proposed to address the baryon asymmetry of the universe, of which the Leptogenesis mechanism has received widespread attention due to the flourishing development of the neutrino physics. In this talk I will give a brief review on recent progress of the Leptogenesis mechanism.

Primary author: CHAO, Wei (Beijing Normal University)

Presenter: CHAO, Wei (Beijing Normal University)

Session Classification: 会议报告 / Workshop Seminars

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

Core-collapse supernova modeling and neutrino signals

Saturday, 29 November 2025 17:35 (25 minutes)

Core-collapse supernovae (CCSNe) mark the death of massive stars greater than about 8 solar masses. They are the birthplaces of neutron stars and black
holes, as well as the factories of heavy elements. The physical mechanism(s) driving their explosions is a premier open problem in astrophysics. In this talk, I will first introduce recent global efforts in advanced computer simulations that enhance our understanding of how CCSNe explode. Next, I will discuss the theoretical predictions of CCSN neutrino signals and what we can learn from them.

Primary author: ZHA, Shuai (Yunnan Observatories, Chinese Academy of Sciences)

Presenter: ZHA, Shuai (Yunnan Observatories, Chinese Academy of Sciences)

Session Classification: 会议报告 / Workshop Seminars

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

Supernova constraints on millicharged particles and axions

Saturday, 29 November 2025 16:20 (25 minutes)

I will discuss supernova constraints on millicharged particles and axions, including both supernova cooling limits and low-energy supernova constraints.

Primary author: LIU, Zuowei (Nanjing University)

Presenter: LIU, Zuowei (Nanjing University)

Session Classification: 会议报告 / Workshop Seminars

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

On the origin of ˜ 100 TeV neutrinos from the Seyfert galaxy NGC 7469

Saturday, 29 November 2025 16:00 (10 minutes)

The origin of TeV-PeV neutrinos detected by IceCube remains largely unknown. The most significant individual neutrino source is the Seyfert galaxy NGC 1068 with a soft spectrum. Another notable candidate is the Seyfert galaxy NGC 7469, which has been recently proposed as a potential neutrino
emitter. The likelihood fit of the IceCube data for this source returned a hard spectral index of ~ 1.9 and the excess is dominated by two high-energy events.
The energies of these two neutrinos are estimated to be $100 - 200$ TeV, implying a maximum proton energy $E_{p,\max} > 2\,\mathrm{PeV}$, significantly higher than that in NGC 1068.
In this paper, we analyze the {\it Fermi}-LAT observations of NGC 7469, which yield non-detection. The size of the neutrino-emitting region can be constrained by the non-detection when the neutrino flux takes a high value in the allowed range.
We suggest that cosmic-ray protons are accelerated to PeV energies via turbulence or magnetic reconnection in the corona and produce $\sim 100 - 200$ TeV neutrinos via $p\gamma$ process.
In the turbulence acceleration scenario, the required maximum proton energy can be achieved with a magnetization parameter of $\sigma \sim 1$, while in the reconnection scenario, a magnetization parameter with $\sigma \sim 10$ is needed. In both scenarios, a pair dominated composition for the corona is preferred.
The difference in the neutrino spectrum between NGC 7469 and NGC 1068 could be due to a different magnetization parameter despite the fact that they belong to the same type of AGN.

Primary authors: YANG, Qi-rui (南京大学); 陈, 晓斌 (Nanjing University); LIU, Ruoyu (Nanjing University); 王, 祥玉 (南京大学); LEMOINE, Martin (Institut d'Astrophysique de Paris)

Presenter: YANG, Qi-rui (南京大学)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

Proposal for a next generation neutrino astronomy telescope

Sunday, 30 November 2025 10:40 (25 minutes)

In 2021, LHAASO observed a large number of PeV cosmic ray candidates in the Milky Way. We proposed to build a telescope with at least 30 times the sensitive volume of the IceCube detector, so as to observe those LHAAASO sources. In order to realize this project, we innovatively put forward a photosensitive detector unit based on a photomultiplier tube with a maximum photosensitive area of 20 inches. We have already started the prototype work in Lake Baikal and South China Sea respectively. It is estimated that within three years, we will complete the R&D work of the project.

Primary author: ZENG, Zongkang

Presenter: ZENG, Zongkang

Session Classification: 会议报告 / Workshop Seminars

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

Testing leptogenesis from observable gravitational waves

Saturday, 29 November 2025 14:50 (25 minutes)

Leptogenesis provides an elegant mechanism to explain the observed baryon asymmetry of the Universe (BAU), yet its experimental verification remains challenging due to requirements of either extremely heavy right-handed neutrinos or precisely fine-tuned mass splittings.
We present a scenario where an additional scalar field, coupled to both the Higgs and right-handed neutrinos (RHNs), enhances the CP asymmetry through loop-level contributions, enabling successful leptogenesis at the electroweak scale. This same scalar sector triggers a strong first-order electroweak phase transition (EWPT), producing gravitational waves (GWs) within the reach of next-generation detectors. We demonstrate a robust correlation between the BAU and GW signal strength, offering a concrete path to experimentally probe leptogenesis at future GW observations.

Primary authors: LIU, Wei（刘威）(Nanjing University of Science and Technology（南京理工）); WU, Yongcheng (Carleton University)

Presenter: LIU, Wei（刘威）(Nanjing University of Science and Technology（南京理工）)

Session Classification: 会议报告 / Workshop Seminars

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

Constraints on neutrino non-standard interactions from COHERENT, PandaX-4T and XENONnT

Saturday, 29 November 2025 16:10 (10 minutes)

We investigate constraints on neutrino non-standard interactions (NSIs) in the effective field theory framework, using data from the first measurement of solar ^{8}B neutrinos via coherent elastic neutrino-nucleus scattering (CEνNS) in the PandaX-4T and XENONnT experiments and data from the COHERENT experiment. The impacts of neutrino NSIs on the CEνNS cross section and the matter effect in the propagation of solar neutrinos are included, while we obtain that the expected number of CEνNS events is more sensitive to neutrino NSIs appearing in the cross section.
Due to relatively large statistical uncertainties, the sensitivities of the PandaX-4T and XENONnT experiments to the neutrino NSIs are currently limited, compared to the COHERENT experiment. Besides, we find that since the central value of the measured CEνNS counts significantly differs from the Standard Model prediction, the sensitivity of PandaX-4T experiment is even more restricted compared to XENONnT.
However, the measurements of PandaX-4T and XENONnT are uniquely sensitive to the neutrino NSIs for the τ flavor due to oscillation feature of the solar ^{8}B neutrinos.
We also assess how the experimental central value, exposure, and systematic uncertainties will affect the constraints on neutrino NSIs from various CEνNS measurements in the future.

Primary authors: TANG, Fengjie (Sun Yat-sen University); SONG, Chuan-Qiang (School of Fundamental Physics and Mathematical Sciences); LI, Gang (Sun Yat-sen University); YU, Jiang-Hao (Institute of Theoretical Physics)

Presenter: TANG, Fengjie (Sun Yat-sen University)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

Ground-based Verification Experiment of Ultra-High-Energy Neutrino Detection on the Moon Using Radio Waves

Saturday, 29 November 2025 17:10 (25 minutes)

In the construction of future lunar scientific stations, radio arrays can be deployed on the lunar surface and around subsurface lava tubes to detect high-energy neutrinos. The Askaryan effect, generated by the interaction between high-energy neutrinos and lunar regolith, produces radio emissions. On Earth, detecting radio signals from this effect is subject to significant radio frequency interference, resulting in a low signal-to-noise ratio for neutrino-related signals. This report presents the observation of radio signals within mountain rock caves of a certain thickness. The implementation of detection technologies related to this method will significantly enhance the likelihood of detecting neutrinos. As a prospective project proposal, this report addresses the identification, directional localization, and energy reconstruction of neutrino-associated radio signals from three aspects: the antenna array system, the ultra-low-noise nanosecond-scale pulse signal acquisition system, and the online signal identification and storage system.

Primary author: JIN, Hong-Bo (National Astronomical Observatories, Chinese Academy of Sciences)

Presenter: JIN, Hong-Bo (National Astronomical Observatories, Chinese Academy of Sciences)

Session Classification: 会议报告 / Workshop Seminars

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

Non-holomorphic modular symmetry

Saturday, 29 November 2025 11:10 (25 minutes)

The original modular flavor symmetry requires supersymmetry to enforce the Yukawa couplings to be holomorphic modular forms. The non-holomorphic modular symmetry is a generation in which supersymmetry is unnecessary in principle. In this talk, we shall present motivation, the formalism and application of non-holomorphic modular symmetry. A predictive model for both quarks and leptons will be presented, the phenomenological predictions are explored.

Primary author: DING, Gui-Jun (University of Science and Technology of China)

Co-authors: QU, Bu-Yao (University of Science and Technology of China); LU, Jun-Nan (University of Science and Technology of China)

Presenter: DING, Gui-Jun (University of Science and Technology of China)

Session Classification: 会议报告 / Workshop Seminars

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

Probing dark particles in scattering experiments

Saturday, 29 November 2025 15:40 (10 minutes)

We present a model-independent search for a dark particle χ produced via four-fermion effective interactions at the DUNE Near Detector, COHERENT, and CONUS+ experiments. Analyzing scalar, pseudoscalar, vector, axial-vector, and tensor operators, we find a clear sensitivity hierarchy. DUNE-ND dominates for most interactions due to its high-intensity beam, while COHERENT and CONUS+ provide complementary constraints at lower masses. The results, strongly dependent on the Lorentz structure, give stringent universal bounds applicable to scenarios like Left-Right Symmetric Models and sterile neutrinos, offering a powerful tool for interpreting future neutrino data.

Primary authors: FENG (冯), Ruofei (若斐) (东南大学); ZHANG, Yongchao (Southeast University); GE, Shao-Feng (SJTU); MA, Xiao-Dong (SCNU)

Presenter: FENG (冯), Ruofei (若斐) (东南大学)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

Revisiting SN1987A constraints on dark photon and Z'

Saturday, 29 November 2025 15:50 (10 minutes)

We discuss the dark photon and Z' emission from supernova. We evaluate the production amplitude for the dark photon and Z' via nucleon bremmstrahlung process $NN \to NNZ'$. Finally, We derive the SN1987A constraints on dark photon and Z' from the stellar cooling argument.

Primary authors: ZHANG, Yongchao (Southeast University); 王, 尊 (东南大学)

Presenter: 王, 尊 (东南大学)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

Neutrinoless double beta decay from the RG-improved dim-7 SMEFT interactions

Saturday, 29 November 2025 14:25 (25 minutes)

We present an automatic renormalization group equations (RGEs) solver, D7RGESolver, designed for the precise numerical solution of one-loop RGEs of dim-7 operators within the SMEFT. This tool is capable of calculating the RGE effects of dim-5 and dim-7 SMEFT operators between any two scales above the electroweak scale. We take the nuclear neutrinoless double beta ($0\nu\beta\beta$) decay process as an example to appreciate the importance of the running effects in phenomenological studies. Our analysis demonstrates that $0\nu\beta\beta$ decay can constrain nearly all dim-7 SMEFT operators involving first-generation leptons that violate lepton number by two units, after accounting for RGE effects. Specifically, we have placed meaningful constraints on 55 dim-7 Wilson coefficients, compared to only 10 from a simple tree-level analysis. Certain operators exhibit much stricter constraints when RGE effects are included, especially for the operators that mix with neutrino mass operators.

Primary author: MA, Xiao-Dong (SCNU)

Presenter: MA, Xiao-Dong (SCNU)

Session Classification: 会议报告 / Workshop Seminars

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

Exact parametrization of a minimal seesaw model

Saturday, 29 November 2025 15:40 (10 minutes)

We propose a parametrization of neutrino masses and mixing in the minimal seesaw model (MSM). The MSM, which introduces two heavy sterile neutrinos, is the minimal extension of the Standard Model in addressing the tiny masses of active neutrinos. The parametrization includes 11 free parameters: 6 neutrino oscillation parameters (2 mass-squared differences Δm^2_{21}, Δm^2_{31}, 3 mixing angles θ_{12}, θ_{13}, θ_{23}, and 1 Dirac phase $\delta_{\rm CP}$), 1 mass parameter in $0\nu2\beta$ decay m_{ee}, and 4 additional parameters: 2 heavy neutrino masses M_1 and M_2, 1 active-sterile mixing angle θ_{14} and 1 CP-violating phase δ_{14}. This parametrization is derived exactly from the most general neutrino mass matrix in the MSM without any approximation. We further discuss its implications in phenomenological studies.

Primary author: Mr CHEN, Zi-Qiang (HIAS-UCAS)

Co-authors: Mr HU, Xi-He (国科大杭州高等研究院); Prof. ZHOU, Ye-Ling (UCAS Hangzhou Institute for Advanced Study)

Presenter: Mr CHEN, Zi-Qiang (HIAS-UCAS)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

A radiative lepton model in a non-invertible fusion rule

Sunday, 30 November 2025 15:15 (25 minutes)

We propose a new mechanism wherein the electron and muon masses are generated at the one-loop level following the dynamical violation of the Ising fusion rule symmetry. This rule, being the minimal symmetry required to realize our model, also plays a crucial role in the neutrino sector. There, while neutrino masses are likewise generated at one loop, the Ising fusion rule stabilizes the particles inside the loop, effectively functioning as an unbroken Z2 symmetry to all orders. We subsequently investigate lepton flavor-violating processes, the muon ' s anomalous magnetic dipole moment, and the relic density of dark matter. For the latter, we identify a singlet boson as our dark matter candidate and provide an initial estimate of its relic density via the annihilation cross section. Finally, we present results for both the dark matter annihilation cross section and the muon g − 2 that are consistent with neutrino oscillation data and satisfy the constraints from lepton flavor violation.

Primary authors: Prof. GENG, Chao-Qiang; Mr CHEN, Jingqian; Prof. OKADA, Hiroshi; Dr WU, Jia-Jun

Presenter: Dr WU, Jia-Jun

Session Classification: 会议报告 / Workshop Seminars

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

The plan and status of NEON

Sunday, 30 November 2025 11:30 (25 minutes)

Over the past ten years, several breakthroughs have been made in multi-messenger astronomy. Thanks to the IceCube Neutrino Observatory, the detection of astrophysical neutrinos was proved to be practical. However, due to the limited statistics and field of view, only a few sources have been associated with IceCube neutrinos, making new and larger neutrino telescopes necessary. NEON is a proposed NEutrino Observatory in the Nanhai to be complementary for the global neutrino detectors. This talk presents the detector array ' s design, layout, and comprehensive performance including angular resolution and point source sensitivities. We further report the current status of simulations and detector construction efforts.

Primary authors: Mr XIE, Caijin; Mr SHAO, Chenyu; Mr ZHANG, Huiming; Prof. YANG, Lili (SYSU); LIN, Sujie (高能所); Dr LIU, Yihan; Mr SHI, Yihan; Dr CUI, YuDong (SYSU); Mrs HUANG, Yunlei; Mr QIU, Zijian

Presenter: LIN, Sujie (高能所)

Session Classification: 会议报告 / Workshop Seminars

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

Ultrahigh-energy neutrinos as probes of the extreme universe

The detection of ultrahigh-energy neutrinos not only offers a powerful probe of cosmic-ray accelerators but also opens a new window into fundamental particle physics. Ultrahigh-energy neutrino experiments have access to unprecedented energy, time, and length scales, providing unique opportunities to deepen our understanding of yet-unrevealed aspects of the Universe. Beyond the achievements of IceCube, many forthcoming telescopes aim to extend these efforts with much larger statistics and higher energy reach. In this talk, I will summarize theoretical models that can affect the observables measured by these next-generation experiments and discuss their potentials.

Primary author: HUANG, Guoyuan (中国地质大学（武汉）)

Presenter: HUANG, Guoyuan (中国地质大学（武汉）)

Session Classification: 会议报告 / Workshop Seminars

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

利用有限温度场论研究电弱相变

Saturday, 29 November 2025 15:50 (10 minutes)

我们将在报告中讨论有限温度场论在电弱相变中的应用及其理论不确定性。

Primary author: 覃, 仁晖 (重庆大学)

Presenter: 覃, 仁晖 (重庆大学)

Session Classification: 茶歇 + 展报 / Tea Break+Poster

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

Implications of the KM3NeT Ultrahigh-energy Event on Neutrino Self-interactions

Sunday, 30 November 2025 16:50 (25 minutes)

Neutrino self-interactions (νSI) mediated by light bosonic particles can produce characteristic spectral dips in astrophysical neutrino fluxes, thereby modifying the expected energy spectrum. The high-energy astrophysical neutrino spectrum has been extensively used to probe νSI models through these distinctive features. The recent detection of the ultrahigh-energy event KM3-230213A offers a new opportunity to explore νSI phenomenology at extreme energies. In this work, we investigate two implications of this observation under the assumption that the event originates from a diffuse power-law spectrum. First, we find that νSI induces spectral distortions that can mildly alleviate tensions between the KM3-230213A detection and the previous non-observation of PeV-scale neutrinos in IceCube data. Second, we derive new constraints on the νSI coupling strength for mediator masses around 100 MeV. Our analysis shows that neutrino telescopes can surpass existing collider constraints in this mass range. In the near future, IceCube-Gen2 is expected to substantially enhance the sensitivity to νSI over a broader range of parameter space.

Primary author: HE, Yuxuan (香港城市大学)

Presenter: HE, Yuxuan (香港城市大学)

Session Classification: 会议报告 / Workshop Seminars

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

Experimental overview of neutrinos

Saturday, 29 November 2025 08:40 (30 minutes)

Presenter: YI JIA (JUNO)

Session Classification: 会议报告 / Workshop Seminars

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

Experimental overview of neutrinoless double beta decay

Saturday, 29 November 2025 09:40 (30 minutes)

Presenter: MA, Hao (Tsinghua University)

Session Classification: 会议报告 / Workshop Seminars

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

Theory overview of neutrinos

Saturday, 29 November 2025 09:10 (30 minutes)

Presenter: LI, Yufeng (IHEP, Beijing)

Session Classification: 会议报告 / Workshop Seminars

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

Neutrino Cosmology

Saturday, 29 November 2025 10:45 (25 minutes)

Presenter: XIA, Junqing (Beijing Normal University)

Session Classification: 会议报告 / Workshop Seminars

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

Loop-level lepton flavor violation in the minimal left-right symmetric model

Saturday, 29 November 2025 14:00 (25 minutes)

Presenter: ZHANG, Yongchao (Southeast University)

Session Classification: 会议报告 / Workshop Seminars

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

Overview of high-energy neutrino

Saturday, 29 November 2025 15:15 (25 minutes)

Primary author: WANG, Zhenjie (南京大学)

Co-author: LIU, Ruoyu (Nanjing University)

Presenters: LIU, Ruoyu (Nanjing University); WANG, Zhenjie (南京大学)

Session Classification: 会议报告 / Workshop Seminars

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

Lepton Number Violation: Inter-frontier Connections

Sunday, 30 November 2025 08:30 (30 minutes)

Presenter: RAMSEY-MUSOLF, Michael (Shanghai Jiao Tong University)

Session Classification: 会议报告 / Workshop Seminars

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

Nuclear matrix elements for neutrinoless double beta decay

Sunday, 30 November 2025 09:30 (25 minutes)

Presenter: YAO, Jiangming (中山大学)

Session Classification: 会议报告 / Workshop Seminars

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

Overview of CEvNS experiments

Sunday, 30 November 2025 09:55 (25 minutes)

Presenter: GAO, Fei (Tsinghua University)

Session Classification: 会议报告 / Workshop Seminars

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

Recent progress on TRIDENT

Sunday, 30 November 2025 11:05 (25 minutes)

Presenter: MEI, Hualin (Shanghai Jiao Tong University)

Session Classification: 会议报告 / Workshop Seminars

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

Neutrino backgrounds in matter-wave interferometry: implications for dark matter searches and beyond-Standard Model physics

Sunday, 30 November 2025 16:25 (25 minutes)

We present a comprehensive theoretical analysis of neutrino-induced decoherence in macroscopic matter-wave interferometry experiments designed to search for dark matter and beyond-Standard Model physics. Our calculation includes contributions from the cosmic neutrino background (CνB), solar neutrinos, and reactor antineutrinos, accounting for coherent scattering processes across nuclear, atomic, and macroscopic length scales. Within the Standard Model, we find negligible decoherence rates for planned experiments such as MAQRO (s/σs ~ 10−27) and terrestrial interferometers like Pino (s/σs ~ 10−22). However, these experiments achieve competitive sensitivity to beyondStandard Model physics through light vector mediator interactions, with CνB constraining coupling products to gvgn ⊠ 10−17 for Z ′ masses below 1 eV. Our results provide a theoretical framework for interpreting matter-wave interferometry measurements in terms of neutrino interaction physics and for deriving constraints on BSM models from experimental data.

Presenter: PINHEIRO, João Paulo (T.D. Lee Institute)

Session Classification: 会议报告 / Workshop Seminars

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

Sterile Neutrino Oscillations with a Crossing-width Term

Sunday, 30 November 2025 14:50 (25 minutes)

Presenter: TANG, Yi-Lei (中山大学)

Session Classification: 会议报告 / Workshop Seminars

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

Cosmological signatures of neutrino seesaw mechanism

Saturday, 29 November 2025 16:45 (25 minutes)

Primary author: 韩, 成成 (Sun Yat-sen University)

Presenter: 韩, 成成 (Sun Yat-sen University)

Session Classification: 会议报告 / Workshop Seminars

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

Modular TM1 mixing in light of precision measurement in JUNO

Sunday, 30 November 2025 17:15 (25 minutes)

Primary author: 欧阳, 瑞文

Presenter: 欧阳, 瑞文

Session Classification: 会议报告 / Workshop Seminars

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

Probing Exotic Neutrino Interactions with SN1987A

Saturday, 29 November 2025 16:10 (10 minutes)

Primary author: 邹, 锐 (南方科技大学)

Presenter: 邹, 锐 (南方科技大学)

Session Classification: 茶歇 + 展报 / Tea Break+Poster