

# **Bled 2024: International Workshop on Lepton Number Violation**

## **Report of Contributions**

Contribution ID: 7

Type: **not specified**

## Arrival and welcome

*Monday 17 June 2024 18:00 (2 hours)*

Contribution ID: 8

Type: **not specified**

## **Didar Dobur: Experimental Search for Heavy Neutral Leptons at LHC**

*Tuesday 18 June 2024 09:30 (45 minutes)*

Contribution ID: **10**

Type: **not specified**

## **Jan Hajer: Heavy Neutrino-Antineutrino Oscillations**

*Tuesday 18 June 2024 10:45 (45 minutes)*

Contribution ID: 11

Type: **not specified**

## Richard Ruiz: Light mesons from light heavy neutrinos at colliders

*Tuesday 18 June 2024 14:15 (45 minutes)*

In the context of the Phenomenological Type I Seesaw, we investigate the LHC's sensitivity to exclusive, mesonic decay modes of long-lived, light (Dirac and Majorana) heavy neutrinos  $N$  when they are produced in the decays of  $W$  bosons. We present a new framework that combines massless QCD to describe  $N$ 's production up to NLO in QCD via weak bosons with a low-energy effective field theory to describe  $N$ 's decays to mesons. We provide a prescription for fast, numerical determination of  $N$ 's partial and total widths for any mass and accounts for mesonic decay modes.

Contribution ID: **12**

Type: **not specified**

## Discussion

*Tuesday 18 June 2024 15:30 (1h 30m)*

Contribution ID: 13

Type: **not specified**

## **Fabrizio Nesti: something with left-right symmetry at colliders**

*Wednesday 19 June 2024 09:30 (45 minutes)*

Contribution ID: 14

Type: **not specified**

## Jonathan Kriewald: What's next in Left-Right

*Wednesday 19 June 2024 10:45 (45 minutes)*



Contribution ID: 15

Type: **not specified**

## Afternoon talk

Contribution ID: **16**

Type: **not specified**

## Boat Trip to the Bled Island

*Wednesday 19 June 2024 15:45 (1h 45m)*

Contribution ID: 17

Type: **not specified**

## **Jernej Debevc: Experimental searches for type-II and type-III seesaw heavy leptons with the ATLAS detector**

*Thursday 20 June 2024 10:15 (45 minutes)*

Contribution ID: **18**

Type: **not specified**

## **Lara Čalić: Type II, Type III and tau fakes and background estimation (ABCD method)**

*Thursday 20 June 2024 11:30 (45 minutes)*

Contribution ID: **19**

Type: **not specified**

## **Suchita Kulkarni: Exploring neutrino phenomenology in B-L extensions**

*Thursday 20 June 2024 14:15 (45 minutes)*

Contribution ID: **20**

Type: **not specified**

## Discussion

*Thursday 20 June 2024 15:30 (1h 30m)*

Contribution ID: 21

Type: **not specified**

## Antonio Sidoti: Lepton Number Violation searches in ATLAS

*Wednesday 19 June 2024 11:30 (45 minutes)*

Lepton number is conserved in the Standard Model, therefore, any evidence for its violation would indicate the existence of new physics. This talk presents a review of the latest Lepton Number Violation searches performed by ATLAS at the LHC concerning Lepton Number Violation based on Run2 data.

Contribution ID: 22

Type: **not specified**

## Daniele Barducci: The effective theory of right-handed neutrinos at collider

*Friday 21 June 2024 10:45 (45 minutes)*

The see-saw model is the minimal framework which is able to explain the observed pattern of neutrino masses and oscillations. Right-handed neutrinos around the GeV scale are an ideal target for high-energy and high-intensity experiments. While intense experimental efforts have deeply tested this hypothesis, there remain the possibility that the origin of the neutrino sector lies in a more involved theory beyond the Standard Model, whose effect at the electroweak scale can be parametrized in terms of effective operators involving Standard Model and right-handed neutrino fields. I will discuss the associated phenomenology and show the prospects for detecting right-handed neutrinos effective interactions at present and future experimental facilities.



Contribution ID: 23

Type: **not specified**

## Afternoon talk

Contribution ID: 24

Type: **not specified**

## Chayan Majumdar: Exploring Alternative Left-Right Model: Neutrinoless double beta decay and Leptogenesis

*Saturday 22 June 2024 09:30 (45 minutes)*

Left-Right (LR) theories are one of the successful beyond Standard Model scenarios to provide a unified explanation to the origin of small neutrino masses and low-energy parity violation. However, conventional LR theory faces stringent constraints due to Flavor Changing Neutral Currents (FCNCs). We have explored an Alternative LR model (ALRM) that avoids FCNC constraints and introduces new physics signatures in decay and leptogenesis. We have shown that the new type of vector-scalar diagram contributes significantly in Neutrinoless Double Beta decay (NDBD). When the relevant charged Higgs boson has mass around 200 GeV, the half-life of decaying nucleus is approximately  $10^{26}$  years for both Ge-76 and Xe-136, which falls well within the anticipated sensitivity of future NDBD experiments. Moreover, this model has the potential to explain the correct baryogenesis, even in the presence of small Dirac CP phase in right-handed neutrino sector and without requiring any more fine-tuning, by invoking the resonant leptogenesis.

Contribution ID: 25

Type: **not specified**

## Discussion

*Friday 21 June 2024 15:30 (1h 30m)*

Contribution ID: 26

Type: **not specified**

## **Arsenii Titov: Long-lived HNLs at the LHC: four-fermion operators**

*Tuesday 18 June 2024 11:30 (45 minutes)*

Contribution ID: 27

Type: **not specified**

## **Blaž Leban: LRSM: Search for Doubly Charged Higgs bosons with the ATLAS detector + LNV Higgs decays**

*Friday 21 June 2024 09:30 (45 minutes)*

Contribution ID: **28**

Type: **not specified**

## Miha Mali

Contribution ID: 29

Type: **not specified**

## **Patrick Bolton: Probing Heavy Neutrino Magnetic Moments at the LHC Using Non-Pointing Photon Signatures**

*Friday 21 June 2024 11:30 (45 minutes)*

Contribution ID: **30**

Type: **not specified**

## **Chandan Hati: Lepton Number Violation Beyond Dimension 5 Weinberg Operator**

*Saturday 22 June 2024 10:45 (45 minutes)*



Contribution ID: **31**

Type: **not specified**

## Closing and Farewell

*Saturday 22 June 2024 11:30 (30 minutes)*