NAFIS REZWAN KHAN CHOWDHURY

Visiting Postdoctoral Researcher
Department of Astronomy and Astrophysics
Tata Institute of Fundamental Research, Mumbai

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RESEARCH INTERESTS

Neutrino Oscillations, Non-standard Neutrino Interactions, Neutrino Flavour Transitions Beyond the Standard Model (BSM), BSM searches at neutrino telescopes, Deployment of machine learning techniques in the exploration of fundamental physics at neutrino experiments.

APPOINTMENTS

- Visiting Postdoctoral Researcher — Nov 2022 — April 2023
  Department of Astronomy and Astrophysics
  Tata Institute of Fundamental Research (TIFR)
  Mumbai, India

- Postdoctoral Research Associate — June 2022— Sept 2022
  GSI Helmholtzzentrum für Schwerionenforschung GmbH
  Darmstadt, Germany

- Postdoctoral Research Associate — May 2021 — April 2022
  Department of Physics and Astronomy
  University of Utah
  Salt Lake City, Utah, USA

EDUCATION

- Instituto de Fisica Corpuscular (IFIC) - University of Valencia — 2017 — 2021
  Ph.D. in Physics
  Thesis: Search for Non-standard Interactions with ANTARES and KM3NeT/ORCA
  Adviser: Juande Dios Zornoza (IFIC, Valencia)
  Co-adviser: Sergio Navas (University of Granada, Granada)

- Tata Institute of Fundamental Research (TIFR), Mumbai, India — 2015 — 2017
  Ph.D. Candidate in Physics

- Indian Institute of Technology (IIT), Madras, India — 2013 — 2015
  M.Sc. in Physics
  Thesis: Precision measurements of neutrino oscillations parameters at ICal@INO
  Advisor: Jim Libby

- Jadavpur University (JU), Kolkata, India — 2010 —2013
  B.Sc. in Physics

VISITING RESEARCH

- Physical Research Laboratory, Ahmedabad, India — Feb — March 2021
  Host: Srubabati Goswami

- INFN Genova, Italy — May — June 2019
  Host: Marco Agniholfi

- Department of Physics, University of Delhi, India — May — June 2014
  Host: Debajyoti Choudhary

AWARDS

- FPI Ph.D. grant for training of predoctoral candidates funded by Govt. of Spain (2017 - 2021).
  [Application supported by Valencia Experimental Group of Astroparticles (VEGA)]

- Secured All India Rank (AIR) 19 in JEST 2015 in Physics.
  [All-India exam for interview shortlisting at various research institutes in India.]

- INSA-IASc-NASI Summer Research Fellowship (May - June 2014).
  [Competitive call for grants for master research applications.]

- Qualified CSIR-UGC-NET JRF with AIR104 (Roll:514855).
  [Pan-India exam for grant of Ph.D. fellowships by Govt. of India.]

- Recipient of Scholarship for Higher Education (SHE) funded by the Department of Science and Technology, Govt. of India (2010 - 2015). [Awarded to the top 1% in the state.]

PUBLICATIONS

An exhaustive list of publications can be found on iNSPIRE. Ones with significant contributions are listed below leaf.

JOURNAL PAPERS

3. N. Fiza, N. R. Khan Chowdhury, M. Mehedi, *Investigating Lorentz Invariance Violation (LIV) effects on neutrino oscillations in a doubly magic baseline of the Protvino to ORCA (P2O)*, JHEP01 (2023) 076 [2206.14018]

2. KM3NeT Collaboration, *Determination of the Neutrino Mass Ordering and Oscillation Parameters with KM3NeT-ORCA*, EPJC 82 26 (2022) [2103.09885]

1. ANTARES Collaboration, *A search for Neutrino Non-standard Interactions with 10 years of ANTARES data*, JHEP07 (2022) 048 [2112.14517]

CONFERENCE PROCEEDINGS

5. J. J. Hernandez Rey et al., *Latest results on neutrino non-standard interactions with ANTARES and ORCA Phase 1*, Proceedings of the 37th International Cosmic Ray (ICRC2021).

4. N. R. Khan Chowdhury, *Search for neutrino non-standard interactions with ANTARES and KM3NeT-ORCA*. XIX International Workshop on Neutrino Telescopes (NuTel 2021).

3. J. J. Hernandez-Rey et al., *Search for neutrino non-standard interactions with ANTARES and KM3NeT-ORCA*. JINST 16 (2021) 09, C09016 (VLVnT2021).

2. N. R. Khan Chowdhury, *Neutrino Oscillations and Non-Standard Interactions with KM3NeT-ORCA*. Prospects in Neutrino Physics [2004.05004] (NuPhys2019).

1. N. R. Khan Chowdhury et al., *Sensitivity to Non-Standard Interactions (NSI) with KM3NeT-ORCA*. Proceedings of the 36th International Cosmic Ray (ICRC2019).

PREPRINTS

1. D. Kaur, N. R. Khan Chowdhury, U. Rahman, *Effect of non-unitary mixing on the mass hierarchy and CP violation determination at the Protvino to Orca experiment,* [2110.02917]

CONTRIBUTED TALKS

11. *Search for non-standard neutrino interactions with ANTARES and KM3NeT/ORCA*
Very Large Volume Neutrino Telescopes Workshop, Valencia, Spain, May 2021 (Virtual)

10. *Search for NSIs with 10 years of ANTARES data and perspectives for KM3NeT/ORCA*
The XIX International Workshop on Neutrino Telescopes, Venice, Italy, Feb 2021 (Virtual)

9. *Tests of Lorentz symmetry with atmospheric neutrinos in KM3NeT/ORCA*
KM3NeT Oscillation Meeting, Jan 2021 (Virtual)

8. *Sensitivity update on the neutrino non-standard interactions with new ORCA115 20m MC*
ANTARES & KM3NeT Collaboration Meeting, Amsterdam, Netherlands, June 2020 (Virtual)

7. *Non-standard Interactions with atmospheric neutrinos in ANTARES*
ANTARES & KM3NeT Collaboration Meeting, Genova, Italy, Feb 2020

6. *Neutrino Oscillations and Non-standard Interactions at KM3NeT/ORCA*
NuPhys 2019: Prospects in Neutrino Physics, London, UK, Dec 2019

5. *Impact of non-standard interactions on the NMO sensitivity at KM3NeT/ORCA*
ANTARES & KM3NeT Collaboration Meeting, Warsaw, Poland, Oct 2019

4. *Sensitivity to Neutrino non-standard interactions at ANTARES and KM3NeT/ORCA*
ANTARES & KM3NeT Collaboration Meeting, Tbilisi, Georgia, Feb 2018

3. *Neutrino Non-standard Interactions at KM3NeT/ORCA*
   ANTARES & KM3NeT Collaboration Meeting, Caserta, Italy, Oct 2018

2. *Time Calibration with downing atmospheric muons in KM3NeT*
   ANTARES & KM3NeT Collaboration Meeting, Granada, Spain, May 2018

1. *Preliminary Studies of neutrino Mass Ordering at IFIC*
   ANTARES & KM3NeT Collaboration Meeting, Rabat, Morocco, Feb 2018

SEMINARS

2. *Neutrinos beneath the waves: In quest for Non-Standard Neutrino Interactions*
   High Energy Physics Seminars, Department of High Energy Physics
   Tata Institute of Fundamental Research (TIFR), Mumbai, India, Feb 2022

1. *Neutrinos beneath the waves: In search for Non-Standard Interactions.*
   High Energy and Astrophysics Seminar Series, Dept. of Physics and Astronomy,
   University of Utah, Salt Lake City, USA, Jan 2021

POSTERS

4. *Testing the violations of Lorentz Invariance with accelerator neutrinos in P2O and DUNE*
   Neutrino 2022, Seoul, Korea, June 2022 (Hybrid)

3. *Latest results on neutrino non-standard interactions with ANTARES and ORCA Phase 1*
   37th International Cosmic Ray Conference, Berlin, Germany, July 2021

2. *Search for Non-Standard Interaction at Mediterranean Neutrino Telescopes*
   Neutrino 2020, Chicago, Illinois, USA, June 2020

1. *Sensitivity to non-standard neutrino interactions with KM3NeT/ORCA*
   36th International Cosmic Ray Conference, Madison, Wisconsin, USA, July 2019

SOFTWARE SKILLS

PROGRAMMING

Python, C++, Bash

TYPESETTING

LaTeX

VERSION CONTROL

Git

HEP SOFTWARE

ROOT, GLoBES

MACHINE LEARNING

Scikit-Learn, TensorFlow, Keras

PERSONAL DETAILS

DOB: 21/08/1992
Nationality: Indian
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