# Curriculum Vitae


## Anil Kumar

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**Contact Information**

DESY Zeuthen,
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15738 Zeuthen, Germany

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ORCID: 0000-0002-8367-8401


**Personal Information**

Date of birth : 29th, March 1993
Marital status : Unmarried
Nationality : Indian

**Education**

**HBNI/BARC** Mumbai, Maharashtra, India. — August 2016 – May 2022
Research Scholar at India based Neutrino Observatory (INO)

**IIT Roorkee**, Roorkee, Uttarakhand, India. — July 2014 – May 2016
M.Sc. Physics — (CGPA 8.310)

**St. Stephen's College, University of Delhi**, Delhi, India. — July 2011 – May 2014
B.Sc. Physics — (Percentage 81.19 %)

**R.P.V.V** Dwarka, New Delhi, India. — July 2004 - March 2011
Senior Secondary School — (Percentage 90.6 %)
Secondary School — (Percentage 90.83 %)

**Experience**

**DESY** Zeuthen, Germany — May 2022 – Present
Post Doctoral Researcher

**Leadership**

Astrophysics Seminar Organizer at DESY, Zeuthen — Sep 2023 - Current

**Awards**

- 2022: Second position in best talk on National Science Day at Tezpur University
- 2018: Second position in best poster in the XXIII DAE-BRNS High Energy Physics (HEP) Symposium
- 2009: Indira Award for highest marks in Mathematics in CBSE 10th by Delhi Govt

**National Level Exams**

- TIFR 2016 (Qualified)
- GATE 2016 (72 Rank)
- JEST 2016 (481 Rank)
- CSIR-JRF DECEMBER 2015 (57 Rank)
- IIAST 2015 (Qualified)
- JAM 2014 (234 Rank)
- JEST 2014 (59 Rank)

**Research Interest** Neutrino physics, neutrino oscillations, atmospheric neutrinos, beyond the standard model physics, neutrino oscillation tomography of Earth, astrophysical neutrinos, INO-ICAL, experimental aspect of ICAL, RPC, resistivity of Graphite layer, electronics and instrumentation

**Skills**

**Experiments experience**: RPC fabrication and characterization, Surface resistivity of graphite in RPC, Plastic scintillators, Silicon Photo-multiplier, NIM logic units, DAQ systems, Muon decay, Gamma Spectroscopy, HPGe, Cosmic muon veto, Neutron absorption, FPGA, Arduino microcontroller
**Programming and Scripting Languages**: C++, C, Python, Fortran, ROOT, Matlab, GEANT4, GENIE, Microprocessor Programing (8085), HTML, PHP
**Tools**: Git, Jupyter Notebook, Latex, MS Word, Excel, Powerpoint, Inkscape, Kdenlive
**OS** : Linux (Ubuntu, CentOS, Scientific Linux, and Fedora), Windows

**List of Publications***

- Papers published in International Refereed Journals (9)
- Conference Proceedings (8)

**Talks**

1. **Latest muon neutrino disappearance results from IceCube DeepCore**
   The European Physical Society Conference on High Energy Physics (EPS-HEP 2023), University of Hamburg, Germany, Aug 21 - 25, 2023
2. **Probing interiors of Earth using magnetized neutrino detector**
   International Workshop on Multi-messenger Tomography of the Earth (MMTE 2023), APC-Université Paris Cité, Paris, France, Jul 4 - 7, 2023
3. **Neutrino Oscillation Tomography of Earth with a Magnetized Detector having Charge-identification Capability**
   Multi-Messenger Tomography of Earth (MMTE 2022) Workshop - online, Jul 30 - 31, 2022
4. **Validating the Earth's Core using Atmospheric Neutrinos with ICAL at INO**
   National Science Day, Tezpur University - online, Mar 1, 2022
5. **A New Approach to Probe Non-Standard Interactions in Atmospheric Neutrino Experiments**
   - NuFact 2022 - online, Jul 30 - Aug 6, 2022
   - NuFact 2021 - online, Sep 6 - 11, 2021
   - HEP-PHENO School 2021 - online, Aug 31 - Sep 12, 2021
   - TAUP 2021 - online, Aug 26 - Sep 3, 2021
   - APS April Meeting 2021 - online, Apr 17 - 20, 2021
   - Neutel 2021 - online, Feb 18 - 26, 2021
   - DAE-BRNS HEP Symposium - online, Dec 14 - 18, 2020
6. **Exploring Oscillation Dip and Valley, NSI, and Earth's Core using Atmospheric Neutrinos at INO-ICAL**
   - HEP Seminar, Department of Physics, University of Alberta, Canada, Jul 7, 2021
   - Journal Club, Neutrino Astroparticle Physics Lab. Sungkyunkwan University (SKKU), Republic of Korea (South Korea) and Department of Physics and Astronomy, University of Utah, USA , May 28, 2021
7. **From Oscillation Dip to Oscillation Valley in Atmospheric Neutrino Experiments**
   IOPB HEP Journal Club, Mar 11, 2021

* See details in the full list of publications

8. **From oscillation dip to oscillation valley in atmospheric neutrino experiments**
   Virtual Neutrino Theory mini-workshop, Sep 21 - 23, 2020
9. **Characterization of Scintillator Detector**
   XII SERB School on Experimental High-Energy Physics at TIFR, Mumbai, India, Jan 7-27, 2019
10. **Effect of Variation of Surface Resistivity of Graphite Layer in RPC**
    XXIII DAE-BRNS High Energy Physics (HEP) Symposium 2018 held at IIT Madras, India, Dec 10-14, 2018
11. **Sensitivity Studies for Signal Discovery**
    International Neutrino Summer School 2018 at Schloss Waldthausen near Mainz, Germany, May 21 to Jun 1, 2018
12. **Proportional Counter**
    XI SERC School on Experimental High-Energy Physics at NISER, Bhubaneswar, India, Nov 07 - 27, 2017

**Poster Presentations**

1. **Probing the interior of Earth using oscillating neutrinos at INO-ICAL**
   EPS-HEP 2023, University of Hamburg, Germany, Aug 21 - 25, 2023
2. **Validating the Earth's Core using Atmospheric Neutrinos with ICAL at INO**
   NuFact 2021 - online, Sep 6 - 11, 2021
3. **A New Approach to Probe Non-Standard Interactions in Atmospheric Neutrino Experiments**
   - Neutrino 2022, online, May 30 - Jun 4, 2022
   - Lepton Photon 2021, online, Jun 10 - 14, 2022
   - WIN 2021, online, Jun 7 - 12, 2021
   - Invisibles 2021 virtual Workshop, May 31 to Jun 4, 2021
4. **Neutrino tomography of Earth using ICAL@INO**
   XXIV DAE-BRNS High Energy Physics (HEP) Symposium (held online), Dec 14 - 18, 2020
5. **From oscillation dip to oscillation valley in atmospheric neutrino experiments**
   Neutrino 2020 conference (held online), Jun 22 - Jul 2, 2020
6. **India-based Neutrino Observatory: A Mega Science Project**
   National Science Day at Institute of Physics, Bhubaneswar on Feb 28, 2020
7. **Effect of Variation of Surface Resistivity of Graphite layer in RPC**
   XXIII DAE-BRNS High Energy Physics (HEP) Symposium 2018 held at IIT Madras, Dec 10-14, 2018
8. **Exploring Neutrino Properties using Atmospheric Neutrinos at ICAL**
   International Neutrino Summer School 2018 at Schloss Waldthausen near Mainz, Germany, May 21 to Jun 1, 2018

**Conferences & Workshop attended**

1. The European Physical Society Conference on High Energy Physics (EPS-HEP 2023), University of Hamburg, Germany, Aug 21 - 25, 2023
2. International Workshop on Multi-messenger Tomography of the Earth (MMTE 2023), APC-Université Paris Cité, Paris, France, Jul 4 - 7, 2022
3. Multi-Messenger Tomography of Earth (MMTE 2022) Workshop - online, Jul 30 - 31, 2022
4. The 23rd International Workshop on Neutrinos from Accelerators (NuFact 2022, online), Jul 31 to Aug 6, 2022
5. The 22nd International Workshop on Neutrinos from Accelerators (NuFact 2021, online), Sep 6 to 11, 2021

6. 17th International Conference on Topics in Astroparticle and Underground Physics, (TAUP 2021, online), Aug 26 - Sep 3, 2021
7. 28th International Workshop on Weak Interactions and Neutrinos (WIN 2021, online), Jun 7 - 12, 2021
8. Invisibles21 virtual Workshop, May 31 to Jun 4, 2021
9. APS April Meeting 2021 - online, Apr 17-20, 2021
10. XIX International Workshop on Neutrino Telescopes (Neutel 21), Padova (Italy) – online, Feb 18-26, 2021
11. Virtual Neutrino Theory mini-workshop, Sep 21-23, 2020
12. XXIV DAE-BRNS High Energy Physics (HEP) Symposium (held online), NISER, Bhubaneswar, India, Dec 14 - 18, 2020.
13. Neutrino 2020 conference (held online), Jun 22 - Jul 2, 2020
14. XXIII DAE-BRNS High Energy Physics (HEP) Symposium 2018 held at IIT Madras, India, Dec 10-14, 2018

**School attended**

1. Virtual School on Flavor Structure of the Standard Model, HEP-PHENO School (Online), Aug 31 to Sep 12, 2021
2. Invisibles21 School, Apr 12 - May 7, 2021
3. XII SERB School on Experimental High-Energy Physics at TIFR, Mumbai, India, Jan 7-27, 2019
4. International Neutrino Summer School 2018 at Schloss Waldthausen near Mainz, Germany, May 21 to Jun 1, 2018
5. XI SERC School on Experimental High-Energy Physics at NISER, Bhubaneswar, India, Nov 07 - 27, 2017

**Projects and Activities**

Project on Neutron Absorption and Background Suppression due to Cosmic Veto. 2017

Project on Study of Resistive Plate Chamber and Scintillators. 2016

M.Sc. Thesis Project on Solving Coupled Channel Differential Equation with the R-Matrix Method Embedded on a Lagrange Mesh: An Application on $^{37}$Mg. 2015 - 2016

Organised 2 workshops on "Basics of Electronics" and "Designing Power Supply" in Electronics Society in St. Stephen's College. 2014

**Delhi University Innovation Project** 2012 – 2013
"Delhi University Innovation Project: On the Energy, Light Characteristics and Economic Feasibility of LED Luminaires" aimed for feasibility of replacing current Luminaries by the LED Luminaires in the offices, colleges and homes.

Participated in Phoenix workshop at IUAC 2012

Participated in organising Science Games in NSF 2012 at St. Stephen's College. 2012