ANIL SHARMA

Mobile Number : +91 895-568-6725

UGC-DAE CSR, Kolkata Centre
Home Address : 9/A, Mahaveer Colony, Kartarpura,
Jaipur, Rajasthan, India, 302006
Email : anils051299@gmail.com
Webpage : https://anilsharmanp.github.io/

EDUCATION

Doctor of Philosophy(Ph.D) | ***Experimental Nuclear Physics*** — March 2023 – Present
UGC-DAE Consortium for Scientific Research Kolkata Centre — Kolkata

Master of Science | ***Physics*** — Aug. 2019 – July 2021
University of Delhi, New Delhi — Grade : 7.6 CGPA

Bachelor of Science | ***Physics, Mathematics, Chemistry*** — Aug. 2016 – May 2019
University of Maharaja College, Jaipur — Grade : 68.44%

Senior Secondary Exam(12th Standard) — July 2015 – May 2016
Nitin Sr. Sec. School, Jaipur — Grade : 89.60%

Secondary Exam(10th Standard) — July 2013 – May 2014
Ankit Public Sr. Sec. School, Jaipur — Grade : 84.17%

RESEARCH EXPERIENCES

Collaborative Project : Pulse shape analysis — May 2023 – Present
UGC-DAE Consortium for Scientific Research, Kolkata Centre — Kolkata

- Worked on response pulse shaping and filtering of a nuclear source for a radiation detector
- Also, I worked on the multichannel analyzer(MCA) and Digital Signal Processing how we get the spectrum through any response signal using the peak amplitude of pulses.
- I used CR-RC^4 filter for shaping and moving average and moving window deconvolutional for filtering.

Study of bulk properties of a medium by heavy ion collisions — Feb 2023 – Nov 2023
Joint Institute for Nuclear Research, Dubna — Dubna, Russia

- I acquired a better understanding of the QCD phase transition mechanism.
- I present the measurement of bulk properties of the matter produced in Bi+Bi collisions at $\sqrt{s_{NN}} = 9.2$ GeV using the identified hadrons ($\pi \pm$), kaons(K $\pm$), proton(p) from the MPD experiment at the Nuclotron-based Ion Collider fAcility (NICA).
- We are generating the data of Bi+Bi collisions by the statistical Monte Carlo generator model named Ultrarelativistic Quantum Molecular Dynamics (UrQMD).
- Also, I analyze the data using the MpdRoot framework and obtain the results on transverse momentum(p_T) spectra, radial position of the event vertex, track selection for TPC(Time projection chamber), Particle identification from the experimental data, the distance of closest approach (DCA) between each track and the event vertex and then the cuts using the rapidity and total momentum analysis.

Collaborative Project : Simulation of HPGe-Detector with GEANT4 — Aug 2020 – July 2021
University of Delhi — New Delhi

- I created a virtual detector with a replica used in the computation, which was created inside the Geant4 simulation.
- The simulation output had been compared with the data from the experiment performed under nearly similar conditions.
- I did the calculation of the electric field and the simulation of the detector is an implementation of the electric field inside the HPGe crystal and gets the pulse shape for each randomly incident particle.

Dissertation Project : Exploring the Neutron Star with *ab initio* model Jan 2021 – July 2021
University of Delhi New Delhi

- Study about the Relativistic Brueckner Hartree Fock(RBHF) approach in *ab initio* model.
- Learn about the Relativistic Mean Field(RMF) theory approach also.
- Calculate the fitting parameters for the energy density and compare them with the theoretical models.

Campaign : Asteroid Search Campaigns Oct 2020 – Nov 2020
International Astronomical Search Collaboration (IASC)

- We did some observations of near-Earth objects and Main Belt asteroids by participating in the analysis of images from Pan-STARRS.
- In this project we also learn about how to use the ASTROMETRICA software.
- We discovered two unidentified objects through the given data and images.

PUBLICATIONS

- Aspects of single particle excitations and collectivity in ^{69}Ga.
Anil Sharma, S. Nandi, S. Samanta, S. Kundu, A. Das, S. S. Ghugre, and R. Raut, S. S. Tiwary, I. Bala, R. P. Singh, and S. Muralithar. PHYSICAL REVIEW C 113, 014304 (2026)
- Excitation functions of (α,xn) reactions in natural Sb.
Pankaj K. Giri, Sandipan Dasgupta, **A. Sharma**, S. Kundu, A. Das, S.S. Ghugre, G. Mukherjee, S. Bhattacharyya, J. Datta, and R. Raut. Nuclear Physics A 1062 (2025) 123171
- Shape transition and development of triaxiality in ^{154}Tb.
N. Susshma, R. Gowrishankar, S. Deepa, K. Vijay Sai, S. Chatterjee, **A. Sharma**, S.S. Ghugre, Shabir Dar, S. Das, S. Basu, S. Nandi, S. Bhattacharya, S.S. Nayak, G. Mukherjee, S. Bhattacharyya, R.P. Singh, G.H. Bhat, J.A. Sheikh, S. Jehangir, and R. Raut. Nuclear Physics A 1055 (2025) 123019
- Investigation of the cross sections of natCu(α,x)^{66,67}Ga, ^{65}Zn reactions.
Pankaj K. Giri, S. Dasgupta, **A. Sharma**, K. Basu, S. S. Ghugre, J. Datta, G. Mukherjee, S. Bhattacharyya, P. Pallav and R. Raut . Journal of Radioanalytical and Nuclear Chemistry (2024) 333:5589–5595
- Decay of ^{131}La.
S. Banerjee, S. Bhattacharyya, S. Chakraborty, Soumik Bhattacharya, G. Mukherjee, S.S. Nayak, Snigdha Pal, Suchorita Paul, A. Pal, D. Kumar, R. Banik, S. Panwar, S. Basu, S. Das Gupta, R. Raut, S.S. Ghugre, Pankaj K. Giri, **A. Sharma**, S. Kundu, C. Majumder, A. Karmakar, S. Rajbanshi, S. Ganguly, H. Rahaman. Nuclear Physics A 1061 (2025) 123142

ORAL PRESENTATIONS

- Level Structure of ^{69}Ga.
A. Sharma, Aditi Das, S. Kundu, Pankaj K. Giri, S. S. Ghugre, S. Samanta, K. Katre, I. Bala, R. P. Singh, S. Muralithar, A. Sharma, S. Ali, S. S. Tiwary, S. Bhattacharya, S. Rajbanshi, and R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. A21 (2024)

PROCEEDINGS

- A Universal Algorithm for Calculating the Probability of Photoelectric Absorption.
A. Chettri, **A. Sharma**, S. Kundu, A. Das, K. Vijay Sai, S. S. Ghugre, R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. 69, H62 (2025)
- Investigation of Quasi Fission in ^{16}O+^{209}Bi Using γ-Ray Spectroscopy.
Soumalya Kundu, Aditi Das, **Anil Sharma**, Pankaj K. Giri, A. Sen, T.K. Ghosh, Suchorita Paul, Snigdha Pal, A. Pal S Basak, S. Chakraborty, S. S. Nayak, Soumik Bhattacharya, G. Mukherjee, S. Bhattacharyya, S S Ghugre, and R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. 69, A11 (2025)
- Spectroscopy of 67Zn using Digital INGA at VECC.
A. Sharma, S. Kundu, Pankaj K. Giri, S. S. Ghugre, S. S. Nayak, S. Basu, S. Pal, S. Das, S. Dar, S. Paul, A. Pal, S. Basak, G. Mukherjee, S. Bhattacharyya, R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. 67, A31 (2023)
- Study of bulk properties of the medium produced in heavy ion collisions at MPD.
Anil Sharma, Alexey Aparin. Proceedings of the DAE Symp. on Nucl. Phys. 67, E23 (2023)

- Integration of CeBr3 Fast Scintillators with the Digital INGA at VECC.
  S. Kundu, **A. Sharma**, Pankaj K. Giri, S. S. Ghugre, S. Bhattacharya, S. S. Nayak, S. Das, S. Bhattacharyya, G. Mukherjee, R. Palit, R. P. Singh, R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. 67, G90 (2023)
- Excitation Function Measurement of α + natSb Reactions for Production of Iodine Isotopes.
  Pankaj K. Giri, **A. Sharma**, K. Basu, S. S. Ghugre, S. Dasgupta, J. Datta, G. Mukherjee, S. Bhattacharyya, P. Pallav, R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. 67, B186 (2023)
- Excitation Function Measurement of α + natCu Monitor Reactions between 40 and 50 MeV.
  Pankaj K. Giri, **A. Sharma**, K. Basu, S. S. Ghugre, S. Dasgupta, J. Datta, G. Mukherjee, S. Bhattacharyya, P. Pallav, R. Raut. Proceedings of the DAE Symp. on Nucl. Phys. 67, B187 (2023)
- Digital pulse-shape analysis algorithms for gamma-ray spectroscopy.
  Kausik Basu, **Anil Sharma**, Soumalya Kundu, Pankaj K. Giri, Sandeep S. Ghugre, Rajarshi Raut, Amitabha Das, Mithun Das. Proceedings of the DAE Symp. on Nucl. Phys. 67, G76 (2023)

TEACHING AND MENTORING

Mentor March 2023 – Present
UGC-DAE CSR Kolkata Centre Kolkata

- Hadi Mohammed Soufy, Integrated M.Sc Student at NISER Bhubaneswar during his NIUS program on the topic of digital pulse processing.
- Monsum Hatikakoty, Mariyam Rasul, Arijee, Nilraj, Kangkan Jyoti Saikia, Krishna, Master's students at Cotton University, Assam
- Ananya, Sukanya, and Shubham, Master's students at Cotton University, Assam
- Disha, and Midhuna, Master's students from Mumbai and Niser respectively
- Sambit Barman, Master's student from Paskuda Bandu College on the topic of Background radiation subtraction.

SPECIALISED COURSE CURRICULUM

- Theoretical & Experimental Nuclear Physics
- Introductory Astronomy
- Nuclear Astrophysics
- Computational Physics Lab
- Classical Mechanics
- Quantum Mechanics
- Statistical Physics
- Electromagnetic theory and Electrodynamics
- Atomic and Molecular Physics
- Nuclear and Particle Physics
- Mathematical Physics
- Electronics

LAB SKILLS AND EXPERIENCE

- Working in India's largest nuclear campaign INGA(Indian National Gamma Array) at VECC(variable energy cyclotron centre). Here, we are making the whole array like beam line arrangement, placing ACS(Anti Compton shields) and detectors in the array, and managing the cabbling, cooling process, and electronics of the detectors.
- know about handling the detectors like Clover, LEPS, HPGe, Scintillators($LaBr_3$, NaI, BaF_2, etc.)
- Personally taking care things of clover detector like replacing their Pre-Amplifier card, annealing process, their cooling or liquid nitrogen filling process, and other electronics as well.
- I gained some knowledge in target preparation for nuclear experiments. Last target, we used, were Antimony(Sb) with mylar, Copper(Cu), Aluminium(Al) etc.
- Handled Data acquisition system and modules like Pixie-16 from XIA, USA.

SKILLS

- **Languages**: English, Hindi, Sanskrit
- **Known Operating System**: Windows, LINUX/UNIX, MacOS
- **Programming Languages**: C/C++, Python, Fortran
- **Document Creation**: M.S Word, M.S Excel, M.S PowerPoint, LaTeX, Beamer in LaTeX
- **Software for Nuclear Physics**: ROOT data analysis(CERN), Geant4, Radware, LISE++, SRIM, Candle(IUAC)
- **Other Scientific Software**: Image Reduction and Analysis Facility (IRAF), MATLAB, Mathematica, Astrometrica, ORIGIN, GnuPlot

AWARDS AND QUALIFIED NATIONAL LEVEL EXAMS

- Got prize money worth 5000 Rupees in 10^{th} Standard from Department of Science and Technology for getting one hundred percent(100%) marks in Mathematics subject.
- Received Inspire Scholarship for Higher Education (for B.Sc and M.Sc. both) from 2016 to 2021 because I was a student within the top 1% in our state of our 12^{th} Standard examination.
- Get the same Inspire Fellowship for the Ph.D. program in 2022 as well.
- Graduate Aptitude Test in Engineering(GATE)-2022, **Score**: 438, **Percentile**: 92.80%
- Joint Entrance Screening Test (JEST)-2021(For PhD program), **All India Rank**: 253, **Percentile**: 95.07%
- Joint Entrance Screening Test (JEST)-2019 (for Master program), **All India Rank**: 110, **Percentile**: 98.36%
- Joint Admissions test for Masters (JAM)-2019, **Score**: 50.33, **Percentile**: 95.17%
- Delhi University Entrance Exam (For M.Sc. Program)-2019, **Score**: 68, **All India Rank**: 10
- Joint Entrance Examination (JEE) Main-2016, **Score**: 131, **Percentile**: 95.98%

PERSONAL QUALITIES

- Quick learning and sharp problem-solving skills.
- Self-starter with the ability to handle multiple priorities.
- Hardworking, dedicated, and fast learner.
- Well organized and have an excellent work ethic.
- Excellent communication skills in written and verbal both.
- Experienced in clarifying doubts in the concerned subject.
- Proficient in basic computer use and internet savvy.
- Proficient table tennis, cricket, and chess player.

HOBBIES & INTEREST


Sports


Problem Solving


Healthcare


Cooking