Dr. Niyaz Ahmad Rather
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Personal Details:

1. Designation: **Assistant Professor (Physics)**
2. Date of Birth: ***3rd March 1986***
3. Gender: **Male**

Positions held:

April, 2018 – Present : Assistant Professor Physics (Islamic university of Science & Technology, Awantipora)
September, 2017 – March, 2018 : Lecturer Physics (Education Deptt. J&K Govt.)
March, 2016 – August, 2017: Lecturer Physics (National Institute of Technology, Srinagar).
October, 2015 - February, 2016 : Research Associate (Saha Institute of Nuclear Physics, Kolkata, India).
August, 2012- August, 2015: Senior Research Fellow (SRF) at Saha Institute of Nuclear Physics, Kolkata, India.
August, 2010 - July, 2012: Junior Research Fellow (JRF) at Saha Institute of Nuclear Physics, Kolkata, India.

Research Projects

- Two year UGC-BSR Start-Up grant of Rs 10,00,000/- from May, 2019 - May, 2021 (Order no. F.30-498/2019(BSR)).
- Core Research Grant funded by SERB-DST (Govt. of India) of Rs 30,85,896/- from February, 2021 - February, 2024 (SERB File no. CRG/2019/004960)

Educational Qualification:

- **Ph. D (2016):** Subject area: *Physics [Experimental Nuclear Physics]*. **Work done** *at Saha Institute of Nuclear Physics, Kolkata and Tata institute of Fundamental Research, Mumbai.* **Ph D Registration With** *Homi Bhabha National Institute, Mumbai.*
- **M Sc (2009):** Subject: *Physics, from University of Kashmir, Jammu & Kashmir, India. (First class).*
- **B. Sc (2007)** Subjects: *Physics, Mathematics, Electronics, English (First class).*

ACADEMIC ACHIEVEMENTS:

- Qualified for Junior Research Fellowship (JRF-NET) in 2009 (conducted jointly by Council of Scientific and Industrial Research and the University Grants Commission, Government of India).
- Awarded the best publications award for the academic year 2014 by Saha Institute of Nuclear Physics for publishing in Physical Review Letters.

Research:

1. Research Associate: 1st October 2015 – February, 2016
2. Ph D Program: 16th August 2010 – 30th September 2015
3. Thesis defended on: 18th December 2015
4. Thesis Supervisor: Prof. Sukalyan Chattopadhya
5. Place of Work: High Energy Nuclear and Particle Physics Division Saha Institute of Nuclear Physics, India

Title of the thesis: **Angular Momentum generation Mechanisms in mass-100 Region**

Broad subject area: **Nuclear Structure Physics.**

Experimental Skills:

Setting up of experiments:

- Setting up of the experimental arrangement for the detection of γ rays using HPGe Clover detectors.
- Target preparation that are utilized during the γ-ray spectroscopy experiments.
- Characterisation of HPGe detector.

Theoretical Skills:

- Hartree-Fock and Hartree-Fock-Bogoliubov Theory as used in the study of nuclear structure.
- Non-Unitary Hartree-Fock-Bogoliubov Theory.
- Triaxial Projected Shell Model.

Teaching Experience:

PG Level:

1. Quantum Mechanics
2. Nuclear Physics
3. Group Theory
4. Numerical Analysis
5. Research Methodology

UG Level:

1. Electromagnetic Theory
2. Mechanics

List of Publications

Refereed Journal Publications:

- **Emergence of principal axis rotation in ^{110}Ag**

Santosh Roy, **N. Rather**, Pradip Datta, S. Chattopadhyay, R.A. Bark, S. Pal, S. Bhattacharya, R.K. Bhowmik, A. Goswami, H.C. Jain, R. Kumar, E. Lawrie.

PHYSICS LETTERS B, 710 (2012) 587-593

- **Exploring the Origin of Nearly Degenerate Doublet Bands in ^{106}Ag**

N. Rather, P. Datta, S. Chattopadhyay, S. Rajbanshi, A. Goswami, G. H. Bhat, J. A. Sheikh, S. Roy, R. Palit, S. Pal, S. Saha, J. Sethi, S. Biswas, P. Singh, and H. C. Jain.

PHYSICAL REVIEW LETTERS 112, 202503 (2014).

- **Antimagnetic rotation in ^{104}Pd**

N. Rather, S. Roy, P. Datta, S. Chattopadhyay, A. Goswami, S. Nag, R. Palit, S. Pal, S. Saha, J. Sethi, T. Trivedi, and H. C. Jain.

PHYSICAL REVIEW C 89, 061303(R) (2014).

- **Three proton hole structure in ^{106}Ag**

B. Das, **N. Rather**, S. Chattopadhyay, S. Rajbanshi, A. Goswami, P. Datta , S. Roy, R. Palit, S. Pal, S. Saha, J. Sethi, S. Biswas, P. Singh, and H. C. Jain

PHYSICAL REVIEW C 93, 064322 (2016).

- **Novel evolution of the positive parity shears band in ^{106}Ag**

B. Das, **N. Rather**, P. Datta, 3, S. Chattopadhyay, S. Rajbanshi, A. Goswami, S. Roy, S. Pal, R. Palit, S. Saha, J. Sethi, S. Biswas, P. Singh and H. C. Jain 6

PHYSICAL REVIEW C 95, 051301(R) (2017).

- **High-spin doublet band structures in odd–odd $^{194-200}$Tl isotopes**

S. Jehangir, I. Maqbool, G. H. Bhat, J. A. Sheikh, R. Palit, **N. Rather**

European Physics Journal A (2020).

- **Evidence of antimagnetic rotational motion in ^{103}Pd**

Sharma,R. Raut, S. Muralithar , R. P. Singh , S. S. Bhattacharjee, S. Das, S. Samanta, S. S. Ghugre, R. Palit, S. Jehangir, **N. Rather** , G. H. Bhat, J. A. Sheikh, S. S. Tiwary, Neelam, P. V. Madhusudhana Rao, U. Garg, and S. K. Dhiman

PHYSICAL REVIEW C 103, 024324 (2021)

- **Triaxial projected shell model study of γ -bands in atomic nuclei**

S. Jehangir, G. H. Bhat, J. A. Sheikh, S. Frauendorf, W. Li, R. Palit, **N. Rather**

European Physics Journal A (2020) 57:308

- **Systematic study of near-yrast band structures in odd-mass 125−137Pr and 127−139Pm isotopes**

S. Jehangir, G. H. Bhat, **N. Rather**, J. A. Sheikh and R. Palit

PHYSICAL REVIEW C 104, 044322 (2021)

- **Three-phonon multiplets in 116Sn**

Prithwijita Ray, H. Pai, Sajad Ali, A. Mukherjee, S. Rajbanshi, S. Chakraborty, Soumik Bhattacharya, R. Banik, S. Nandi, S. Bhattacharyya, G. Mukherjee, C. Bhattacharya, G. Gangopadhyay, S. Samanta, S. Das, S. Chatterjee, R. Raut, S.S. Ghugre, P.C. Srivastava, S. Jehangir, Bharti Bhoy, **N. Rather**
G.H. Bhat, J.A. Sheikh, A. Goswami
Nuclear Physics A 1018 (2022) 122375

- **Extended triaxial projected shell model approach for odd-neutron nuclei**

S. Jehangir, Nazira Nazir, G. H. Bhat, J. A. Sheikh, **N. Rather**, S. Chakraborty, and R. Palit
PHYSICAL REVIEW C 105, 054310 (2022)

- **Chiral-like doublet band structure and octupole correlations in 104Ag**

Nazira N, Kaushik Katre, P. V. Madhusudhana Rao, R. Raut, A. Sharma, K. Suryanarayana, A. Tejaswi, M. Ratna Raju, D. Vijaya Lakshmi, T. Seshi Reddy, M. Kumar Raju, S. Jehangir, **N. Rather**, G. H. Bhat, Nazira Nazir, J. A. Sheikh, Y. P. Wang, J. T. Matta, A. D. Ayangeakaa, U. Garg, S. S. Ghugre, T. Trivedi, B. S. Naidu, R. Palit, S. Saha, S. Muralithar, and R. P. Singh
PHYSICAL REVIEW C 106, 034323 (2022)

- **Evidence for prolate-oblate shape coexistence in the odd-A nucleus**

S. Bhattacharya, T. Trivedi, A. Mukherjee, D. Negi, R. P. Singh, S. Muralithar, S. Jehangir, G. H. Bhat, Nazira Nazir, J. A. Sheikh, **N. Rather**, R. Palit, S. Nag, S. Rajbanshi, S. Chakraborty, S. Kumar, M. Kumar Raju, V. V. Parkar, D. Choudhury, R. Kumar, R. K. Bhowmik, S. C. Pancholi, and A. K. Jain
PHYSICAL REVIEW C 106, 044312 (2022)

- **Microscopic aspects of γ softness in atomic nuclei**

Nazira Nazir, S. Jehangir, S. P. Rouoof, G. H. Bhat, J. A. Sheikh, **N. Rather**, and S. Frauendorf
PHYSICAL REVIEW C 107, L021303 (2023)

- **Evidence of transverse wobbling motion in 151Eu**

A. Mukherjee, S. Bhattacharya , T. Trivedi , S. Tiwari , R. P. Singh , S. Muralithar, Yashraj, K. Katre, R. Kumar, R. Palit, S. Chakraborty, S. Jehangir, Nazira Nazir, S.P. Rouoof , G. H. Bhat, J. A. Sheikh, **N. Rather** , R. Raut , S. S. Ghugre, S. Ali, S. Rajbanshi, S. Nag, S. S. Tiwary, A. Sharma, S. Kumar, S. Yadav, and A. K. Jain

PHYSICAL REVIEW C 107, 054310 (2023)

- **Fingerprints of the triaxial deformation from energies and $B(E2)$ transition probabilities of γ -bands in transitional and deformed nuclei**

S. P. Rouoof, Nazira Nazir, S. Jehangir, G. H. Bhat, J. A. Sheikh, **N. Rather**, S. Frauendorf

The European Physical Journal A 60:40 (2024)

- **Coexistence of low-K oblate and high-K prolate $g_{9/2}$ proton-hole bands in ^{115}Sb**

Shabir Dar, S. Bhattacharyya, S. Chakraborty, S. Jehangir, Soumik Bhattacharya, G.H. Bhat, J.A. Sheikh, **N. Rather**, S.S. Nayak, Sneha Das, S. Basu, G. Mukherjee, S. Nandi, R. Banik, S. Basak, C. Bhattacharya, S. Chattopadhyay, S. Das Gupta, A. Karmakar, S.S. Ghugre, D. Kumar, D. Mondal, S. Mukhopadhyay, D. Pandit, S. Rajbanshi, R. Raut

PHYSICS LETTERS B 851, 138565 (2024)

Papers Published as Conference Proceedings:

I. "High Spin Spectroscopy Of ^{105} Pd." **N. Rather**, P. Datta, Santosh Roy, S. Chattopadhyay, A. Goswami, S. Nag, R. Palit, S. Saha and T. Trevadi. "Emergence of principal axis rotation in ^{110}Ag"

Proceedings of the DAE Symp. on Nucl. Phys. 57 (2012) pg. 310-311.

II. "Staircase bands in odd-odd Ag isotopes: ^{107}Ag a case study." P. Datta, **Niyaz Rather**, Santosh Roy, S. Chattopadhyay, A. Goswami, S. Nag, R. Palit, S. Saha and T. Trevadi.

Proceedings of the DAE Symp. on Nucl. Phys. 57 (2012) pg. 312-313.

III. "Search for Anti-magnetic rotations in ^{104}Pd." **Niyaz Rather**, P. Datta, Santosh Roy, S. Chattopadhyay, A. Goswami, S. Nag, R. Palit, S. Saha, and T. Trevad.

Proceedings of the DAE Symp. on Nucl. Phys. 58 (2013) pg. 124-125.4.

IV. *"High Spin Spectroscopy of ^{105}Pd."* **N. Rather**, *P. Datta, S. Roy, S. Chattopadhyay, A. Goswami, S. Nag, R. Palit, S. Saha, J. Sethi, T. Trivedi.*

Proceedings of the DAE Symp. on Nucl. Phys. 58 (2013) pg. 122-123.

V. *"Co-existance of AMR and collective rotation in ^{105} Pd."* **Niyaz Rather**, *P. Datta, Santosh Roy, S. Chattopadhyay, A. Goswami, S. Nag, R. Palit, S. Saha, and T. Trevad.*

Proceedings of the DAE Symp. on Nucl. Phys. 59 (2014) pg. 108-109.

VI. "*Staircase bands in ^{105,107,109}Ag: Fingerprint of interplay between Shears Mechanism and Collective Rotation*." *B. Das*, **Niyaz Rather**, *P. Datta, S. Chattopadhyay, A. Goswami, S. Rajbanshi, G. H. Bhat, J. A. Sheikh, S. Roy, R. Palit, S. Pal, S. Saha, J. Sethi, S. Biswas, P. Singh, and H. C. Jain.*

Proceedings of the DAE Symp. on Nucl. Phys. 57 (2012) pg. 312-313.

Schools/Symposia/Work Shops/Conferences attended:

- *Proceedings of the DAE Symposium on Nuclear Physics, 2012 (INDIA).* **Poster presentation on** "Staircase bands in odd-odd Ag isotopes: ^{107}Ag a case study".
- *Proceedings of the DAE Symposium on Nuclear Physics, 2013 (INDIA).* **Poster presentation on** "High Spin Spectroscopy of ^{105}Pd".
- *Proceedings of the DAE Symposium on Nuclear Physics, 2014 (INDIA).* **A talk on** "Co-existance of AMR and collective rotation in ^{105}Pd".
- *Attended a SERC school held at TIFR, Mumbai INDIA in 2014* **on the topic** "Nuclear structure at high spin and isospin.
- **Participated in** Two-day National Workshop on Nano-science - Opportunities and Challenges in 2018 at IUST.
- **Participated in** one week faculty development program on "Emerging Trends in Physics, Chemical and Mathematical Sciences" from 14-20th, February 2019 held at IUST.
- **Attended** "One-Week Summer School on Quantum Mechanics" from 29th July - 4Th August, 2019 held at IUST.

- **Attended** Two-Week school from 10th - 23rd October, 2019 on the topic "Role of Symmetries in Nuclear Physics" held by Amity University, Utter Pradesh.
- **Attended** orientation course from 28th July - 17th August, 2020 organised by Human Resource Development, Mizoram University.
- **Attended** Two-Week refresher course from 27th October - 10th November, 2021 organised by Teaching Learning Centre, Ramanujan College, New Delhi.

Organised:

- **Organised** one week faculty development program on "Emerging Trends in Physics, Chemical and Mathematical Sciences" from 14-20th, February 2019 held at IUST.
- I was an **organising member** of Two-day National Workshop on Nano-science - Opportunities and Challenges in 2018 organised by the Department of Physics, IUST.
- I was **course director** of "One-Week Summer School on Quantum Mechanics" from 29th July - 4Th August, 2019 held at IUST and organised by the Department of Physics.