# Dr. MADHUMITA NATH

Assistant Professor, Deshabandhu Mahavidyalaya, Chittaranjan, 713331 West Bengal.
9079241479, 9433667016, madhumitanath_21@yahoo.co.in, madhu.mita21@gmail.com

## PERSONAL

**Date of Birth** : 21st March, 1982

**Permanent Address** : 4/1K/12, Ho Chi Min Sarani,
Sarsuna Satellite Township, Behala
Kolkata-700061, INDIA

**Linkedin profile:** https://www.linkedin.com/in/dr-madhumita-nath-5976a732/

## RESEARCH INTERESTS

Computational Physics, Percolation theory, Monte Carlo simulation, Density Functional Theory

## RESEARCHER ID PROFILE

ORCID ID: https://orcid.org/0000-0002-7620-6991

Scopus ID: https://www.scopus.com/authid/detail.uri?authorId=23480130200

WoS ID: https://www.webofscience.com/wos/author/record/AAA-6303-2021

Vidwan ID: https://vidwan.inflibnet.ac.in/profile/194125

Google Scholar link: https://scholar.google.com/citations?hl=en&user=A9fEvHQAAAAJ

Open Access ID: OA-0000-0369

## PROFILE SUMMARY

- Experienced, skilled and student-focused professional
- Provide safe and motivational learning environment
- Strong leadership and management skills
- Experienced in internal administrative tasks in the institution.
- Passionate with excellent presentation, research and communication skills.
- Skilled at applying various learning methods and tools to optimize student experience and academic journey.
- Committed in teaching and research profile with 10+ years of experience in academic landscape.
- Actively contribute as a **reviewer** for Scoupus/WOS indexed journals like Journal of Alloys and Compounds and Micro and Nanostructures.
- Provide thorough evaluations and constructive feedback on submitted manuscripts, ensuring the maintenance of high editorial standards.

## ACADEMIC QUALIFICATION

| EXAMINATION | BOARD/ UNIVERSITY | INSTITUTE | YEAR OF PASSING | %OF MARKS | GRADE |
|---|---|---|---|---|---|
| **10th standard** | W.B.B.S.E | U G M K Girls' high School | 1998 | 84.0 | 1st Division |
| **10+2 standard** | W.B.C.H.S.E | U G M K Girls' high School | 2000 | 86.7 | 1st Division |
| **B.Sc. (Hons. in Physics)** | Burdwan University | B.B. College, Asansol | 2003 | 71.25 | 1st Class |
| **M.Sc. (Physics)** | Jadavpur University | Jadavpur University | 2005 | 74.73 | 1st Class |
| Awarded **Ph. D** degree in July 2010 by Jadavpur University, Kolkata. Ph.D Research work was being done at **Indian Association for the Cultivation of Science** under the supevision of Prof. Parsathi Chatterjee. **Title of the Thesis:** "Computer modelling of Silicon Solar Cells of different of Crystallinity" (theoretical). | | | | | |

## POSTDOCTORAL (RESEARCH) EXPERIENCE

- *From 11th July 2010 to 28th September 2010* – Research Associate I, worked under the supervision of Prof. P. Chatterjee of Indian Association for the Cultivation of Science, Kolkata, India.

  *Field of work:* Computer modeling of microcrystalline silicon solar cell.

  *Job profile:*
  - Interpreted results of experiments and identified trends in data.
  - Provided technical support to other researchers in the lab.
  - Created presentations to explain research findings to colleagues and supervisors.
  - Collaborated with other scientists to develop new methods for analyzing data.

- *From 1st October 2010 to 30th September 2011* – CNRS postdoctoral fellow, France, worked under the supervision of Prof. Pere Roca I Cabarrocas.

  *Field of work:* Simulation of polymorphous and microcrystalline silicon solar cell.

  *Job profile:*
  - Field of work: Simulation of polymorphous and microcrystalline silicon solar cell
  - Developed and implemented research protocols for postdoctoral studies.
  - Analyzed data collected from experiments and prepared reports of findings.
  - Authored manuscripts for publication in scientific journals.
  - Provided technical support to other researchers working in the lab.
  - Prepared scientific reports, outcome findings and scientific manuscripts.

- *From 12th January 2012 to 14th August 2012* – DST Fellow worked with Prof. P. Chatterjee of Indian Association for the Cultivation of Science, Kolkata, India.

  *Field of work:* Modeling of triple junction solar cell

  *Job profile:*
  - Field of work: Modeling of triple junction solar cell
  - Provided mentorship to new Fellows, helping them transition into their roles.
  - Assisted with the development of performance metrics for Fellow evaluation.
  - Collaborated with other Fellows in order to identify areas for improvement.
  - Participated in regular team meetings to discuss progress and challenges.
  - Conducted research on best practices related to Fellow responsibilities and duties.
  - Attended conferences and seminars relevant to Fellow job roles and responsibilities.

**TEACHING EXPERIENCE (nearly 10 years):**

- *From 17th August 2012 to 30th June 2015 (2.10 Years):* Associate Professor in Department of Physics, University of Engineering and Management, Jaipur, Rajasthan.

  *Job details:*
  - Supervised graduate student research projects in support of their dissertations.
  - Coordinated with department staff to ensure proper scheduling of classes and events.
  - Collaborated with other departments to create interdisciplinary programs for students.
  - Mentored junior faculty members on teaching methods and scholarly writing techniques.
  - Advised undergraduate and graduate students on academic matters such as course selection and career paths.
  - Compiled data from surveys administered to assess student satisfaction with courses.
  - Participated in university initiatives designed to increase diversity among faculty members.

- *From 6th July 2015 to 20th June 2016 (11 Months):* Associate Professor & Head of Department in Department of Physics, Supreme Knowledge Foundation Group of Institutions, Kolkata, West Bengal.

  *Job details:*
  - Supervised graduate student research projects in support of their dissertations.
  - Coordinated with department staff to ensure proper scheduling of classes and events.
  - Mentored junior faculty members on teaching methods and scholarly writing techniques.
  - Compiled data from surveys administered to assess student satisfaction with courses.
  - Implemented strategies aimed at improving student engagement during lectures or discussions.

- Actively participated in departmental committee evaluation of peers as well as promotion and tenure votes.

- *From October 2016 to July 2017:* Worked as freelancer Physics Faculty at toppr.com community

  *Job details:*
  - Presented students with information and resources to promote academic progress and empowered students to take responsibility for academic success.
  - Provided guidance and support to students regarding course selection, academic progress, and college resources.
- *From 3rd July 2017 to 30th June 2018 (1 Year):* Associate Professor in Department of Physics, University of Engineering and Management, Jaipur, Rajasthan

  *Job details:*
  - Supervised graduate student research projects in support of their dissertations.
  - Coordinated with department staff to ensure proper scheduling of classes and events.
  - Collaborated with other departments to create interdisciplinary programs for students.
  - Mentored junior faculty members on teaching methods and scholarly writing techniques.
  - Advised undergraduate and graduate students on academic matters such as course selection and career paths.
  - Compiled data from surveys administered to assess student satisfaction with courses.
  - Participated in university initiatives designed to increase diversity among faculty members.

- *From 9th July 2018 to 31st October 2023 (5 years 4 months)*: Assosiate Professor in Department of Physics, Lovely Professional University, Jalandhar, Punjab.

  *Job details : .*
  - Conducted research on percolation, Monte Carlo Simulation, space weather analysis using ML.
  - Supervised graduate student research projects in support of their dissertations.
  - Coordinated with department staff to ensure proper management of the research work.
  - Collaborated with other departments to create interdisciplinary programs for students.
  - Advised undergraduate and graduate students on academic matters such as course selection and career paths.
  - Mentored junior faculty members on teaching methods and scholarly writing techniques.
  - Reviewed manuscripts submitted for publication in academic journals related to the field.
  - Prepared grant proposals seeking funding for new research projects or initiatives.
  - Assisted colleagues with grant writing processes or other administrative tasks.
  - Administered and graded tests and assignments to evaluate student performance and monitor progress.
  - Mentored and motivated students to increase class participation.

- Maintained students' attendance records, grades and reports in strict confidence.
- Structured assignments with clear goals and criteria for assessment.

- *From 8th November 2023 to till date (presently working)*: Assistant Professor in Department of Physics, Deshabandhu Mahavidyalaya, West Bengal.

*Job Details:*

- Provide instruction and guidance to undergraduate and graduate students in the classroom setting.
- Develope and implement innovative teaching methods that enhanced student engagement and learning outcomes.
- Engage students in lectures by encouraging sharing of opinions and group interactions.

## SUBJECTS TAUGHT IN GRADUATION AND MASTER LEVEL:

*i. Crystallography*
*ii. Optics and photonics*
*iii. Vibration, waves and acoustics*
*iv. Classical Mechanics*
*v. Quantum Mechanics*
*vi. Thermal and Statistical Mechanics*
*vii. Mathematical Physics*
*viii. Electromagnetic field theory*
*ix. Magnetism*
*x. Solid State Physics*
*xi. Modern Physics*
*xii. Research Methodology*

## TRAINING EXPERIENCE:

- Workshop on Vacuum and Cryogenics organized by Indian Physics Association (Calcutta Chapter) & Kalpana Chawla Centre for Space and Nano Sciences, 8-11 November,2004.
- Tutorial on Solar Photovoltaic Technologies : Basics to applications, organized by Indian Association for the Cultivation of Science, Kolkata & Solar Energy Centre, Ministry of New and Renewable Energy, New Delhi. 29-31 January, 2007.
- Faculty development workshop on Applied electromagnetic, circuits, digital signal processing and control engineering organized by SKFGI and SKFGI Student Branch IEEE, Region 10, Kolkata Section, 22-23 June, 2015.
- Two week ISTE Short Term Training Programme (STTP) on Engineering Physics conducted by IIT Bombay, 08-18 December, 2015.
- Training program on “Water budgeting & Management at local level” held at Udaipuria, Block-Govindgarh, District- Jaipur, Rajasthan from 02-03 August 2017.
- One week short term course on Strategic Management and SWOT analysis for

Institute Excellence through ICT conducted by Entrepreneurship Development & Industrial Coordination Department, NITTR, Chandigarh, 24-28 July, 2017.

- One week short term course on Energy, Environment & Sustainable Development through ICT conducted by Entrepreneurship Development & Industrial Coordination Department, NITTR, Chandigarh, 21-25 August, 2017.

## STUDENT GUIDANCE

- Guided B.Sc student for capstone project titled 'Dominant role of percolation in the conductivity of conductor-insulator mixture' in 2019.
- Guided B.Sc student for capstone project titled 'Physical parameter analysis using Ising model' in 2021.
- Guided B.Sc student for capstone project titled 'Review on magnetic properties of rare earth based garnet'.
- Supervisor of Ph.D student, pursuing her research work on percolation theory and Ising model using Monte Carlo Simulation.
- Supervisor of Ph.D student, pursuing her research work on prediction of weather using Machine learning.

## PROFESSIONAL RECOGNITION, AWARDS, FELLOWSHIP RECEIVED

- **National Scholarship** for Madhyamik ($10^{th}$) in 1998.
- **National Scholarship** for B.Sc. in 2003.
- **Qualified in Gate-2005 with 89.56 percentile.**
- **Prof. SN Bose Memorial Bronze medal by Jadavpur University-** for securing highest marks in Theoretical Physics in M.Sc. in 2005.
- **Young Scientist Award** in European Materials Research Society- 2007 at Strasbourg (France).
- **Awarded Postdoctoral Fellowship by CNRS, France, 2010-2011.**
- **Chaired a session** at $3^{rd}$ International Conference on "Foundations and Frontiers in Communication, Computer and Electrical Engineering (C2E2-2016) organized by SKFGI, 15-16 January, 2016.
- Awarded **National Mahila Rattan Gold Medal** Award by IIEM, New Delhi on 2016.
- Awarded **Rashtriya Vidya Gaurav Purashkar** by Indian Solidarity Council, New Delhi on 2016.
- Awarded with **Elite certificate** (top 2% with a consolidated score of 83%) for NPTEL Online Certification course (Funded by Ministry of HRD, Govt. of India) in Solid State Physics (July –October 2017).
- Awarded with **Elite certificate** (with a consolidated score of 67%) for NPTEL Online Certification course (Funded by Ministry of HRD, Govt. of India) in Introduction to Electromagnetic Theory (August –September 2018).
- Awarded with **Elite certificate** (with a consolidated score of 67%) for NPTEL Online Certification course (Funded by Ministry of HRD, Govt. of India) in Outcome based pedagogic principles for effective teaching (August –September 2018).

## PUBLICATIONS

**Twenty (20) Nos. of Scientific Research Papers** in International (17) and National (3) journals and **Eighteen (18)** in the proceedings of International and National Conferences and **Two (2)** national book chapter and **three (3)** international book chapters (Detailed in ANNEXURE-I).

## ORAGANISATION OF INTERNATIONAL SEMINAR

- Secretary of Publication Committee, 18th Photovoltaic Science and Engineering Conference (PVSEC 18), January19-23, 2009, Science City Convention Center, Kolkata.
- Faculty co-ordinator, 4th International Conference Recent Advances IN Fundamental And Applied Sciences, 24-25 March, 2023, Lovely Professional University, Phagwara.

## ACTIVITIES

- A robust record of publications in reputable journals, a consistent and high-quality contribution to the academic community.
- Implemented innovative and effective teaching methodologies that have enhanced student engagement and learning outcomes.
- Successful in student mentorship, resulting in notable achievements such as students winning awards, securing internships, or gaining acceptance to prestigious graduate programs.
- Actively contributed to departmental initiatives, served on committees, and played a role in leadership positions.

## SKILLS

- **Computer Language:** Fortran, C, C++, Python
- **OS:** WINDOWS (Windows for Workgroups, 95, 98, 2000, XP, Vista), Linux
- Technology-Based Learning Tools
- Classroom Lectures
- Student Needs Assessment
- Evaluations and Assessments
- Lesson Plan Creation
- Class Instruction
- Public Speaking
- Classroom Administration
- Academic Research
- Student Counseling
- Faculty Collaboration
- Student Evaluation
- Academic Publication
- Tutoring
- Class Engagement

## LANGUAGE KNOWN

Bengali (mother Tongue), Hindi, English (Highly Proficient), French (At basic level)

*"I hereby undertake all responsibility of the above mentioned & declare it as best of my knowledge."*

Date: 01-08-2024
Place: Rupnarayanpur

Madhumita nath
(Madhumita NATH)

## ANNEXURE-I

## LIST OF PUBLICATIONS

**International Journals**:

1) "Criteria for improved open-circuit voltage in a-Si:H(N)/c-Si(P) front heterojunction solar cells", **Madumita Nath**, J.Damon-Lacoste, P.Roca i Cabarrocas, and P.Chatterjee, Journal of Applied Physics (ISSN: 1089-7550), 103, **034506** (2008). (Q2, IF = 2.877, SJR = 0.668 )

2) "The open-circuit voltage in microcrystalline silicon solar cells of different degree of crystallinity", **Madhumita Nath**, P. Roca i Cabarrocas, E. Johnson, A. Abramov, and P.Chatterjee, Thin Solid Films (ISSN: 0040-6090), 516, **6974** (2008). (Q3, IF = 2.358, SJR = 0.468)

3) "Why does the open-circuit voltage in a micro-crystalline silicon PIN solar cell decrease with increasing crystalline volume fraction?" E.V. Johnson, **M. Nath**, P. Roca i Cabarrocas, A. Abramov, and P.Chatterjee, Journal of Non-Crystalline Solids (ISSN: 0022-3093), 354, **2455** (2008). (Q2, IF = 4.458, SJR = 0.751)

4) "Dominant role of interfaces in N-a-Si:H/P-c-Si heterojunction with intrinsic thin layer solar cells", A. Datta, J. Damon-Lacoste, **M. Nath,** P. Roca i Cabarrocas and P. Chatterjee, Materials Science and Engineering: B (ISSN: 0921-5107), **159-160**, 10-13 (2009). (Q2, IF = 3.407, SJR = 0.599)

5) "Performance of amorphous and microcrystalline silicon pin solar cells under variable light intensity", **M. Nath**, S. Chakraborty, K. H. Kim, E. V. Johnson, P. Roca i Cabarrocas, and P. Chatterjee, Physica Status Solidi (c) (ISSN: 1610-1642), **7**, 1105-1108 (2010). (IF = 0.00, SJR =0.21 )

6) "Performance of microcrystalline silicon single and double junction solar cells of different degrees of crystallinity", **M. Nath**, S. Chakraborty, E. V. Johnson, A Abramov, P. Roca i Cabarrocas, P. Chatterjee, Solar Energy Materials and Solar Cells (ISSN: 0927-0248), **94**, 1477-1480 (2010). (Q1, IF = 7.305, SJR = 1.515)

7) "Insights gained from computer modeling of Heterojunction with Instrinsic Thin layer "HIT" solar cells", A. Datta, M. Rahmouni, **M. Nath**, R. Boubekri, P. Roca i Cabarrocas and P. Chatterjee, Solar Energy Materials and Solar Cells (ISSN: 0927-0248), **94**, 1457-1462 (2010). (Q1, IF = 7.305, SJR = 1.515).

8) “Factors limiting the open-circuit voltage in microcrystalline silicon solar cells” S. Chakraborty, **M. Nath**, P. Roca i Cabarrocas, E.V. Johnson, A. Abramov and P. Chatterjee, EPJ Photovoltaics (ISSN: 2105-0716), **2**, 20101 (2011). (Q4, IF = 0.95, SJR = 0.248).

9) “Magnetic properties of Mn doped ZnO: A Monte Carlo simulation analysis”, A.Bandyopadhyay, N. Gupta, **M. Nath**, S. Chakraborty, S. Sutradhar, Vacuum (ISSN: 0042-207X), 183, 109786 (2021). (Q2, IF = 4.11, SJR = 0.738).

10) “Python – a Tool for Percolation Analysis in Triangular Lattice”, N. Gupta, **M. Nath**, S. Chakraborty, A. Bandyopadhyay, Journal of Nano- And Electronic Physics (ISSN: 2077-6772), 13 (2), 02009 (2021). (Q4, IF = 0.361, SJR = 0.178).

11) “Dielectric study and magnetic property analysis of $Gd_2O_3$ nanorods/nanowire in combination with Monte Carlo simulation”, Atul Bandyopadhyay, Shivam Sharma, **Madhumita Nath**, Arup Karmakar, Kajal Kumari, Soumyaditya Sutradhar, Journal of Alloys and Compounds (ISSN: 0925-8388), **882**, 160720 (2021). (Q1, IF = 6.371, SJR = 1.027).

12) “Exploration of structural and magnetic aspects of biocompatible cobalt ferrite nanoparticles with canted spin configuration and assessment of their selective anti-leukemic efficacy” by A Chakravarty, J. Banerjee, S Chakravarty, S. Samanta, **M. Nath,** S. Chattopadhyay, S. Mitra, S. Chowdhury, S. Dash, A. Bandyopadhyay, Journal of Magnetism and Magnetic Materials (ISSN: 0304-8853), **563**, 169957 (2022). (Q2, IF = 3.097, SJR = 0.606).

13) “Determination of exchange integrals and effect of cationic site occupancy (8b/24d) on the structural and magnetic properties of nanocrystalline Mn-doped Gd2O3”, A. Karmakar, H. Arora, **M. Nath**, S. Sutradhar, B.J. Sarkar, G. Mandal, A. Samanta, A. Bandyopadhyay, Journal of Alloys and Compounds (ISSN: 0925-8388), 931, 167475 (2023). (Q1, IF = 6.371, SJR = 1.027)

14) “Investigation on the structural, magnetic, microwave absorption properties, and shielding effectiveness in the Ku frequency band of pristine and Dy3+ doped Stannous ferrite nanoparticles”, A. Chakrabarti, S. Mitra Banerjee, D. Basandrai, S. Chakravarty, S. Chattopadhyay, S. Sarkar, G. Mandal, **M. Nath**, and A. Bandyopadhyay, Journal of Materials Science: Materials in Electronics (ISSN: 1573-482X), 34:1325 (2023). (Q2, IF = 2.779, SJR = 0.496)

15) “Room temperature magnetic ordering and in vitro antibacterial potency of $Nd^{3+}$ doped $CeO_2$ against the pathogenic bacterial strains”, A. Karmakar, S. Samanta, S. Chattopadhyay, J. Banerjee, **M. Nath**, B.J. Sarkar, D. Raha, S. Mitra, S. Sarkar, S.K. Dash, A. Bandyopadhyay, Chemical Physics Impact (ISSN: 2667-0224), 7:100337 (2023). (Q3, IF = 2.552, SJR = 0.329).

16) "The influence of $Nd^{3+}$ doping on the structural, optical, magnetic, and dielectric characteristics of nanoscale hexagonal wurtzite type ZnO", A Karmakar, T Chakraborty, S Chakravarty, **M Nath**,

S Chakraborty, S Mitra, S Sarkar, G Mandal, A Banerjee, C Bhaumick, S Sutradhar, A Bandyopadhyay, Journal of Magnetism and Magnetic Materials (ISSN: 0304-8853), **591**, 171728 (2024). (Q2, IF = 3.097, SJR = 0.606).

17) "Compositional-driven variations in magnetic, conductivity, and ferroelectric properties of multiferroic $BiFeO_3$–$CoFe_2O_4$ composite system", Rikky Sharma, Rupam Mukherjee, Mehakpreet Kaur, Sanat Kumar Adhikari, **Madhumita Nath**, Deepak Basandrai, Journal of Materials Research, (ISSN: 2044-5326), (2024). (Q2, IF = 2.7, SJR = 0.569). https://doi.org/10.1557/s43578-024-01336-2

**UGC care listed Journals:**

1) "Recent advances in dilute magnetic semiconductor", **Madhumita Nath**, Neeru Gupta, International Journal of Research and Analytical Reviews (ISSN: 2349-5138); 5(4), 476-478 (2018). (IF = 7.17).

2) "HK algorithm for comparing percolation threshold in square and triangular lattice using Python programing", **Madhumita Nath**, Neeru Gupta, Journal of the Gujarat Research Society (ISSN: 0374-8588), 21(8s), 823 (2019). (IF = 4.3).

3) "Realization of ferromagnetic phase transition through Ising model – a literature review", **Madhumita Nath**, Neeru Gupta, Journal of the Gujrat Research Society (ISSN: 0374-8588), 21(8), 902 (2019). (IF = 4.3).

**Conference Papers:**

1)"Factors limiting the open-circuit voltage in a-Si:H(N)/c-Si(P) single heterojunction solar cells : a computer simulation study, **Madhumita Nath,** P.Chatterjee, International Congress on Renewable Energy (ICORE 2006)", Hyderabad 8 – 11 February, 2006.

2)"Criteria for improved open-circuit voltage in a-Si:H(N)/c-Si(P) front heterojunction solar cells", **Madumita Nath**, J.Damon-Lacoste, P. Roca i Cabarrocas, A.Bhaduri, and P.Chatterjee, Proceedings of the 21$^{st}$ European Photovoltaic Solar Energy Conference and Exhibition, 4-8 September, 2006, Dresden, Germany, p. 1141.

3)"Important characteristic of microcrystalline silicon for improved solar cell performance", **Madhumita Nath** and P. Chatterjee, "18$^{th}$ AGM Materials Research Society of India", 14-16

February, 2007, National Physical Laboratory, New Delhi, p231.

4)"The open-circuit voltage in microcrystalline silicon solar cells of different degrees of crystallinity", **Madhumita Nath**, P. Roca i Cabarrocas, E. V. Johnson, A. Abramov, and P.Chatterjee, 28 May-1 June, 2007 European Materials Research Society Symposium, Strasbourg, France.

5)"Why does the open- circuit voltage in a micro-crystalline silicon PIN solar cell decrease with increasing crystalline volume fraction?" E.V. Johnson, **M.Nath**, P. Roca i Cabarrocas, A. Abramov, and P.Chatterjee, 19-24 August, 2007 International Conference on Amorphous and Nanocrystalline Semiconductors, Colorado, USA.

6)"N-a-Si:H/P-c-Si heterojunction with intrinsic thin layer solar cells: a device controlled by interfaces and contacts", **M. Nath** and P. Chatterjee, "19$^{th}$ AGM Materials Research Society of India", 14-16 February, 2008 Sree Chitra Tirunal Institute for Medical Science & Technology, Thiruvananthapuram, p. 141.

7) "Computer Modeling of "Heterojunction with Intrinsic Thin Layer-HIT" Solar Cells", P. Chatterjee, A. Datta, **M. Nath, "**Recent Trends in Renewable Energy Sources and Technologies (RREST) and Workshop on Solar Photovoltaic System, March 26-28, 2008, HNB Garhwal University, Garhwal Srinagar, India, p. 3.

8) "Dominant role of interfaces in N-a-Si:H/P-c-Si heterojunction with intrinsic thin layer solar cells" A. Datta, J. Damon-Lacoste, **M. Nath,** P. Roca i Cabarrocas and P. Chatterjee, 26-30 May, 2008 European Materials Research Society Symposium, Strasbourg, France.

9) "Performance of microcrystalline silicon single and double junction solar cells of different degrees of crystallinity" **M. Nath,** S. Chakraborty, E. V. Johnson, A. Abramov, P. Roca i Cabarrocas, and P. Chatterjee; Proceedings of 18$^{th}$ Photovoltaic Science and Engineering Conference, January19-23, 2009, Science City Convention Center, Kolkata, India, p. 257.

10) "Insights gained from computer modeling of heterojunction with intrinsic thin layers "HIT" solar cells" A. Datta, M. Rahmouni**, M. Nath**, P. Roca i Cabarrocas and P. Chatterjee, Proceedings of 18$^{th}$ Photovoltaic Science and Engineering Conference, January19-23, 2009, Science City Convention Center, Kolkata, India, p. 17.

11) "Epitaxial growth of crystalline silicon on FeNi42 alloys by PECVD at 175 °C for low cost and high efficiency solar cells", A. Torres Rios, Y. Djeridane, **M. Nath**, P. L. Reydet, J. P. Reyal, P. Roca i Cabarrocas, Proceeding 27th E.U. PVSEC, Vol. Thin Film Crystalline Silicon Solar Cells, No. 3DO.7.1 (2012).

12) “Tunnelling versus recombination at the junction between sub-cells of an a-Si:H/a- Si:H tandem solar cell” S. Chakraborty, **M. Nath**, P. Roca i Cabarrocas and P.Chatterjee, Proceedings of 28th EU PVSEC, 30 Sep – 04 October, 2013, Paris, France.

13) “HK algorithm for estimation of percolation in square lattice using Python programing”, **Madhumita Nath**, Atul Bandyopadhyay and Saptarshi Chakraborty, 3rd International Conference on Condensed Matter & Applied Physics (ICC-2019), Oct. 14-15, 2019, Bikaner, Rajasthan, AIP Conference Proceedings (ISSN: 0094-243X), 2220, p. 130005 (2019). (IF =0.189, SJR = 0.164).

14) “HK algorithm for estimation of percolation in triangular lattice using Python programing” **Madhumita Nath**, Atul Bandyopadhyay, Neeru Gupta and Saptarshi Chakraborty, Conference Proceedings of International Conference on Applied Mathematics and Computational Sciences (ICAMCS-2019) dated 17-19 October 2019, organized by DIT University, Dehradun (Uttarakhand) India.

15) “Groundwater Contamination By E-Waste And Its Remedial Measure – A Literature Review”, N. Gupta and **M. Nath**. 2nd International conference on Recent Advances in Fundamental and Applied Sciences, 5-6 November, 2019, J. Phys.: Conf. Ser. (ISSN: 1742-6596) 1531, p. 012023 (2020). (IF = 0.48, SJR =0.210).

16) “Python – a tool for percolation analysis in triangular lattice”, N. Gupta, **M. Nath**, S. Chakraborty and A. Bandyopadhyay, International conference on multifunctional nanomaterials, December 28-30, 2020.

17) “Physical parameter analysis using Ising model”, Mohit Arora and **M. Nath**, International Conference on Materials for Emerging Technologies (ICMET-21), 18-19 February, 2022, AIP Conf. Proc. 2800, 020274-1–020274-4; (ISSN: 0094-243X), (2023). (IF =0.189, SJR = 0.164).

18) "Rare Earth Based Iron Garnet – A Survey on Its Magnetic Properties", A Priyanshu, **M Nath**, A Bandyopadhyay, 5th International Conference on Materials Science and Manufacturing Technology 2023 (ICMSMT 2023), 13 - 14, April 2023, IOP Conf. Ser.: Mater. Sci. Eng. (ISSN: 1757-899X) 1291, p. 012028 (2023). (IF = 0.50, SJR = 0.249).

**Book Chapter:**

1) “Understanding the effect of irradiation on iron based high temperature superconductor”, **Madhumita Nath**, Saptarshi Chakrobarty, Frontier Aspects of Natural Sciences, Published by The Banaras Mercantile Co. (ISSN: 978-81-86359-83-4) p.102. Publication Year - 2020.

2) “Physics of Ferrite Ceramics”, S. Chattopadhyay, A. Bandyopadhyay[2] and **M. Nath**, Ceramic Science and Engineering: Basics to Recent Advancements, Published by Elsevier (ISBN: 978-0-323-89956-7) p. 165. Publication Year - 2022**.**

3) “Application of Monte Carlo Simulation in dilute magnetic systems and ferrites”, N. Gupta, A. Bandyopadhyay and **M. Nath**, Published by Lambert Academic Publishing, (ISBN: 978-620-4-98114-7) p.55. Publication Year - 2022.

4) “Theoretical Aspect of Magnetism in Non-Magnetic oxides”, **M. Nath**, S. Chakraborty, A. Bandyopadhyay and S. Sutradhar, Defect Induced Magnetism in Oxide Semiconductors, Published by Elsevier (ISBN: 978-0-323-90907-5), p. 57. Publication Year - 2023.

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