

Faculty Profile



1. Name: Dr. Jagadish Chandra Mahato
2. Designation: Assistant Professor
3. Email(s): jagadishc.mahato@visva-bharati.ac.in , jagadishchmahato4@gmail.com
4. Contact number(s): +91 9330266023
5. Present Address (Office): Department of Physics, Visva-Bharati, Santiniketan 731235, West Bengal
6. Google Scholar: <https://scholar.google.com/citations?user=aiCRNJAAAAAJ&hl=en>
7. ORCID ID: <https://orcid.org/0000-0001-5929-8970>
8. WOS ID: <https://www.webofscience.com/wos/author/record/L-2159-2015>
9. Vidyan ID: 261899
10. Research Gate: https://www.researchgate.net/profile/J-C-Mahato?ev=hdr_xprf
11. Membership of Learned Societies: Indian Association for the Cultivation of Science (since 2016), Electron Microscopy Society of India (EMSI) (since 2019)
12. Homepage (If any): <https://jagadishchmahato4.wixsite.com/jcmahato>
13. Publication Summary:
 - (a) No of Research papers - 27
 - (b) No of Book Chapters - 3
 - (c) No of Conference papers - 7
 - (d) No of Review Article - 1
 - (e) h-index - 9
 - (f) i-10 index - 7
14. Date of Joining Visva-Bharati Service: 28.01.2022
15. Education:

Degree	Year	University/Institution
Ph. D.	2009-2015	University of Calcutta (Work done at IACS, Kolkata)
M. Sc.	2006-2008	University of North Bengal, Darjeeling, West Bengal
B. Sc.	2003-2006	Malda College affiliated to the University of North Bengal

16. Academic Positions held (in reverse chronological order)

Sl. No.	Positions held	Institution	Period
1.	Assistant Professor	Ramakrishna Mission Residential College (Auto), Narendrapur	2015-2022
2.	Postdoctoral researcher	Technical University of Braunschweig, Germany	2020-2021

17. Areas of Research: Materials Science, Nanoscience, Computational Physics

18. Subject Specialization: Electronics

19. Courses Teach / Taught:

Undergraduate Courses	Solid State Physics (CC14 (2022-)), Analog System & Application (CC10(2022 & 2023)), Nanomaterials and Applications (DSE (2023))
Postgraduate Courses	Electronics (MPCC24 (2024, 2025)), Nanoscience (MPCE308(2025))
Ph.D. Course-work	

20. Research Guidance:

- (a) No. of Doctoral students: 1 (Ongoing (Dec, 2023-Present))
- (b) No. of M.Sc. Dissertations: 9 (Guided)

21. Research Collaboration: 2 (National)

22. Research Grants/Projects: 1

Sl. No.	Project Title	PI/Co-PI	Funding Agency	Amount	Completed/Ongoing
1.	Structural and electronic property investigation of metallic ultrathin film on InAs(111) surfaces using STM and XPS	PI	UGC DAE CSR Indore	0.45 L	Ongoing (2023-26)

23. Professional Recognition/ Award/ Prize/Fellowship

Sl. No.	Name of Award	Awarding Agency	Year
1.	Best oral presentation award in the session	4th International Conference on Recent Trends in Materials Science & Devices 2026 (ICRTMD-2026)	2026
2.	Best paper presentation Award	International Virtual Conference on Energy Conversion and Storage (ICECS-2K21)	2021
3.	Best poster presentation Award	2nd International Conference on Advanced Nanomaterials and Nanotechnology, 2011 (ICANN'11), IIT Guwahati, India	2011

24. Books / Book Chapters

Sl. No.	Title	Name of Author(s)	Publisher	Year
1.	Theoretical Perspectives and Gas Sensing Mechanisms of MXene Based Gas and Bio-Molecule Sensors	Tuya Dey, Amrutha M, J. C. Mahato , and Brahmananda Chakraborty	CRC Press	2025
2.	Ferromagnetism in Mn and Fe Doped LuN: A Potential Candidate for Spintronic Application	R Sharma, JA Abraham, J. C. Mahato , SA Dar, V Srivastava	In Tech Open	2022
3.	Wire-to-dot shape transition in FeSi ₂	Debolina Das, J. C. Mahato	New Delhi Publishers	2021

List of scientific peer-reviewed research publications and review article

28. Unraveling Interfacial Defect-Driven Charge Transport in Flexible CH₃NH₃PbI₃ Based Solar Cells

RH Sardar, A Bera, A Basu, S Chattopadhyay, SI Ali, S Pramanik, and **J. C. Mahato**

Journal of Electronic Materials, 1-17 (2026)

[IF 2.2 CITED 0]

<https://doi.org/10.1007/s11664-026-12964-1>

27. Unveiling the potential of buckled V₂S₂ monolayer as an efficient anode material for CIBs: A DFT study

Tuya Dey, H K Chandra, P. Sen, B. C. Gupta and **J. C. Mahato***

Journal of Physics and Chemistry of Solids 218, 113849 (2026)

[IF 5.9 CITED 2]

<https://doi.org/10.1016/j.jpcs.2026.113849>

26. MXene to MBene: Ti₂XF₂ (X =B and N) monolayers as potential anode materials for Na- and K-ion storage using density functional theory

Tuya Dey, H K Chandra, B. C. Gupta and **J. C. Mahato***

Journal of Energy Storage 174, 123149 (2026)

[IF 10.5 CITED 1]

<https://doi.org/10.1016/j.est.2026.123149>

25. Harnessing rippled Si₉C₁₅ monolayer for efficient hydrogen storage via lithium functionalization: A first-principles study

Tuya Dey, **J. C. Mahato***, and B. Chakraborty*

International Journal of Hydrogen Energy 249, 155891 (2026)

[IF 9.2 CITED 1]

<https://doi.org/10.1016/j.ijhydene.2026.155891>

24. Glucose Adsorption and Sensing Characteristics of Transition-Metal-Decorated Porous C₂O Monolayers: A DFT Study

Tuya Dey, **J. C. Mahato***, and B. Chakraborty*

Surfaces and Interfaces 87, 108957 (2026)

[IF 6.3 CITED 4]

<https://doi.org/10.1021/acs.langmuir.5c06572>

23. Enhancement of Catechol Sensing due to Strain in BeN₄ Monolayers: A Computational Study
Tuya Dey, Amrutha M, **J. C. Mahato***, and B. Chakraborty*
Langmuir 42(7), 5865–5876 (2026) [IF 3.9 CITED 3]
<https://doi.org/10.1021/acs.langmuir.5c06572>
22. DFT and Green's Function Formalism Investigation of 2D Penta-NiN₂ Nanosheets: Implications for Catechol Sensing
Tuya Dey, K. A. Shah, **J. C. Mahato***, and B. Chakraborty*
ACS Applied Nano Materials 9 (2), 972–982 (2026) [IF 5.5 CITED 5]
<https://doi.org/10.1039/D5TA06475A>
21. Double transition metal MXenes as anode materials for high-capacity multivalent metal-ion batteries: A computational study
Tuya Dey*, B. C. Gupta*, and **J. C. Mahato***
Journal of Materials Chemistry A 13, 14101–14117 (2025) [IF 9.5 CITED 10]
<https://doi.org/10.1039/D5TA06475A>
20. Symmetric and asymmetric surface-terminated MXenes as low diffon barrier anode materials for SIBs and PIBs
Tuya Dey, B. C. Gupta*, and **J. C. Mahato***
International Journal of Hydrogen Energy 154, 150274 (2025) [IF 8.3 CITED 18]
<https://doi.org/10.1016/j.ijhydene.2025.150274>
19. Two-dimensional ScTe₂ monolayer: An efficient anode material for sodium-ion battery and cathode material for lithium-ion and potassium-ion battery
T Dey, S Chowdhury, SG Kang, P Sen, BC Gupta*, **J C Mahato***
Computational Materials Science 253, 113824 (2025) [IF 3.100, CITED 32]
<https://doi.org/10.1016/j.commatsci.2025.113824>
18. Effect of UHV annealing on morphology and roughness of sputtered Si (1 1 1)-(7× 7) surfaces
J C Mahato*, A Roy, R Batabyal, D Das, R Gorain, T Dey, BN Dev
Journal of Crystal Growth 653, 128055 (2025) [IF 2.000, CITED 1]
<https://doi.org/10.1016/j.jcrysgro.2025.128055>
17. Theoretical prediction of the potential of using two-dimensional V₂S₂ as an effective anode for alkali metal ion batteries
S Chowdhury, **J C Mahato**, J S Chung, S G Kang, B C Gupta
Surfaces and Interfaces 51, 104750 (2024) [IF 5.700, CITED 44]
<https://doi.org/10.1016/j.surfin.2024.104750>
16. Effect of dopants in the HTL layer on photovoltaic properties in hybrid perovskite solar cells
RH Sardar, A Bera, S Chattopadhyay, **J C Mahato**, S Sarraf, AK Basu
Journal of Materials Science: Materials in Electronics 34 (32), 2138 (2023) [IF 2.779, CITED 6]
<https://doi.org/10.1007/s10854-023-11535-y>
15. Growth of self-organized epitaxial FeSi₂ and CoSi₂ nanostructures on Si(111)-7×7 surfaces
J. C. Mahato, D. Das, A. Pal, P. Pal, and B. N. Dev
Applied Surface Science 47, 1617–1620 (2022) [IF 6.707, CITED 2]
<https://doi.org/10.1016/j.apsusc.2021.151397>
14. Silicon Nanodots Via Sputtering of Si(111)-7×7 Surfaces and Post-Annealing
J. C. Mahato, D. Das, R. Batabyal, A. Roy, and B. N. Dev
Material Today: Proceedings 47, 1617–1620 (2021) [IF XXX, CITED 1]
<https://doi.org/10.1016/j.matpr.2021.04.319>
13. Tuning the length/width aspect ratio of epitaxial unidirectional silicide nanowires on Si (110)-16× 2 surfaces
J. C. Mahato, D Das, P Das, TK Chini, B. N. Dev
Nano Express 1 (2), 020045 (2020) [IF 2.700, CITED 1]
<https://doi.org/10.1088/2632-959X/abb922>
12. Unidirectional endotaxial cobalt di-silicide nanowires on Si (110) substrates
J. C. Mahato, D. Das, N. Banu, B. Satpati, B. N. Dev
Nanotechnology 28, 425603 (2017) [IF 3.446, CITED 10]
<https://doi.org/10.1088/1361-6528/aa7f31>

11. Real time investigation of the effect of thermal expansion coefficient mismatch on film-substrate strain partitioning in Ag/Si systems
D. Das, N. Banu, B. Bisi, **J. C. Mahato**, V. Srihari, R. Halder, B. N. Dev
Journal of Applied Physics **120**, 135301 (2016) [IF 2.068, CITED 7]
<https://doi.org/10.1063/1.4963872>
10. Ag-induced $\sqrt{3}$ reconstruction on Si(111)/Ge-(5×5) and the surfactant behaviour of Ag in further growth of Ge
J. C. Mahato, D. Das, B. Bisi, A. Pal and B. N. Dev
Applied Surface Science, **356**, 249-258 (2015) [IF 6.707, CITED 2]
<https://doi.org/10.1016/j.apsusc.2015.07.203>
09. Self-organized patterns along sidewalls of iron silicide nanowires on Si(110) and their origin
D. Das, **J. C. Mahato**, Bhaskar Bisi, B. Satpati, and B. N. Dev
Applied Physics Letters **105**, 191606 (2014) [IF 3.515, CITED 22]
<https://doi.org/10.1063/1.4901815>
08. Self-organized trench-island structures in epitaxial cobalt silicide growth on Si(111)
J. C. Mahato, D. Das, R. Batabyal, Anupam Roy and B. N. Dev
Surface Science **620**, 23–29 (2014) [IF 1.876, CITED 9]
<https://doi.org/10.1016/j.susc.2013.10.006>
07. Roughening in Electronic Growth of Ag on Si(111)-(7×7) Surfaces
A. Pal, **J. C. Mahato**, B.N. Dev and D. K. Goswami
ACS Applied Materials & Interfaces **5**, 9517–9521 (2013) [IF 7.500, CITED 6]
<https://doi.org/10.1021/am402258q>
06. Self-organized one-atom thick fractal nanoclusters via field-induced atomic transport
R. Batabyal, **J. C. Mahato**, D. Das, A. Roy, B. N. Dev
Journal of Applied Physics **114**, 064304 (2013) [IF 2.185, CITED 14]
<https://doi.org/10.1063/1.4817520>
05. Uniformity of epitaxial nanostructures of CoSi₂ via defect control of the Si (111) surface
J. C. Mahato, D. Das, A. Roy, R. Batabyal, R. R. Juluri, P. V. Satyam and B. N. Dev
Thin Solid Films **534**, 296–300 (2013) [IF 1.867, CITED 10]
<https://doi.org/10.1016/j.tsf.2013.01.092>
04. First principles electronic structure of coincidence site epitaxial Ag/Si(111) interface
A.H.M. Abdul Wasey, R. Batabyal, **J.C. Mahato**, B.N. Dev, Y. Kawazoe and G.P. Das
Physica Status Solid B **250**, 13313-1319 (2013) [IF 1.605, CITED 18]
<https://doi.org/10.1002/pssb.201248542>
03. Negative differential resistance at the atomic-scale in ultrathin Ag films on Si (111)
R. Batabyal, A. H. M. Abdul Wasey, **J. C. Mahato**, D. Das, A. Roy, G. P. Das and B. N. Dev
Journal of Applied Physics **113**, 034308 (2013) [IF 2.185, CITED 8]
<https://doi.org/10.1063/1.4775816>
02. Nanodot to nanowire: A strain-driven shape transition in self-organized endotaxial CoSi₂ on Si (100)
J. C. Mahato, D. Das, R. Batabyal, A. Roy, R. R. Juluri, P. V. Satyam and B. N. Dev
Applied Physics Letters **100**, 263117 (2012) [IF 3.515, CITED 32]
<https://doi.org/10.1063/1.4731777>
01. Lateral straggling and its influence on lateral diffusion in implantation with a focused ion beam
R. Batabyal, **J. C. Mahato**, A. Roy, S. Roy, L. Bischoff and B. N. Dev
Nuclear Instruments and Method in Physics Research B **269**, 856 (2011) [IF 1.186, CITED 4]
<https://doi.org/10.1016/j.nimb.2010.11.039>

Conferences proceedings

07. Simultaneous growth of sub-nanometer deep vacancy island and epitaxial silicide islands on Si (111)
J. C. Mahato, Debolina Das, R. Batabyal and B. N. Dev
AIP Conf. Proc. **1512**, 748-749 (2013) [IF 0.400, CITED 0]
Solid State Physics, Proceedings of the 57th DAE Solid State Physics Symposium 2012
<https://doi.org/10.1063/1.4791254>
06. Early stage fractal growth in thin films below the percolation limit
R. Batabyal, **J. C. Mahato**, Debolina Das and B. N. Dev
AIP Conf. Proc. **1512**, 740-741 (2013) [IF 0.400, CITED 1]
Solid State Physics, Proceedings of the 57th DAE Solid State Physics Symposium 2012
<https://doi.org/10.1063/1.4791250>
05. Growth of a-few atom wide nanowires with different surface reconstructions via desorption of Au on Si (111) surfaces
Debolina Das, **J. C. Mahato**, R. Batabyal, Nasrin Banu, Bhaskar Bisi and B. N. Dev
AIP Conf. Proc. **1536**, 377-378 (2013) [IF 0.400, CITED 0]
Proceeding of International Conference on Recent Trends in Applied Physics and Material Science
<https://doi.org/10.1063/1.4810258>
04. Self-organized growth of cobalt nanostructures on Ag/Si (111)-7×7 surfaces
R. Batabyal, **J. C. Mahato**, A. Roy and B. N. Dev
AIP Conf. Proc. **1349**, 741-742 (2011) [IF 0.400, CITED 1]
Solid State Physics, Proceedings of the 55th DAE Solid State Physics Symposium 2010
<https://doi.org/10.1063/1.3606071>
03. Desorption of Ag from grain boundaries in Ag film on brand H-passivated Si (111) surfaces
A. Roy, B. Sundaravel, R. Batabyal, **J. C. Mahato** and B. N. Dev
AIP Conf. Proc. **1349**, 691-692 (2011) [IF 0.400, CITED 2]
Solid State Physics, Proceedings of the 55th DAE Solid State Physics Symposium 2010
<https://doi.org/10.1063/1.3606046>
02. Tip-voltage induced modifications and real-time growth observation of adlayer on ultrathin Ag nanoislands on Si (111)-7×7 surfaces
R. Batabyal, **J. C. Mahato**, D. Das, A. Roy, A. S. Bhattacharyya and B. N. Dev
8th International Symposium on Atomic Level Characterizations for New Materials and Devices '11 (ALC'2011), May 22 (Sun) – 27 (Fri), 2011, Seoul, Republic of Korea
01. Quantum size effects in electronic and magnetic behaviour in epitaxial nanostructures
B. N. Dev, R. Batabyal, A. Roy, **J. C. Mahato**, T. Yasue and T. Koshikawa
8th International Symposium on Atomic Level Characterizations for New Materials and Devices '11 (ALC'2011), May 22 (Sun) – 27 (Fri), 2011, Seoul, Republic of Korea

Book chapter

3. Theoretical Perspectives and Gas Sensing Mechanisms of MXene Based Gas and Bio-Molecule Sensors (2025)
Tuya Dey, Amrutha M, **J. C. Mahato** and Brahmananda Chakraborty
DOI: [10.1201/9781003520870-5](https://doi.org/10.1201/9781003520870-5) [CITED 2]
2. Ferromagnetism in Mn and Fe Doped LuN: A Potential Candidate for Spintronic Application
R. Sharma, J. A. Abraham, **J. C. Mahato**, S. A. Dar and V. Srivastava
Book chapter in Density Functional Theory - Recent Advances, New Perspectives and Applications (2022)
DOI: [10.5772/intechopen.99774](https://doi.org/10.5772/intechopen.99774)
1. Wire-to-dot shape transition in FeSi₂/Si system
D. Das and **J. C. Mahato**
Book Chapter in Basic and Applied Sciences into Next Frontiers: The Aspects of Bio & Physical Sciences (2021)
ISBN: [978-81-948993-0-3](https://doi.org/10.1007/978-81-948993-0-3)

Review article

1. Newly Synthesized 2D Polyaramid: Structure, Properties, and Applications in Energy Storage, Electrocatalysis, and Sensing
Manikandan Kandasamy, Tuya Dey, Amreetha Seetharaman, **J. C. Mahato**, and B. Chakraborty*

Journal of Materials Chemistry A 13, 38633-38667 (2025)

[IF 9.5, CITED 3]

<https://doi.org/10.1039/D5TA03830H>

Reviewer of international peer reviewed journals

- ✚ Surfaces and Interfaces, Elsevier
- ✚ International Journal of Hydrogen Energy, Elsevier
- ✚ Nanotechnology, IOP Science
- ✚ Journal of Physics D: Applied Physics, IOP Science
- ✚ Physica Scripta, IOP Science
- ✚ Applied Physics A: Materials Science & Processing, Springer