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Department of Physics, Jengraimukh College,
Jengraimukh, Majuli, Assam, India -787053,

Personal Profile

Date of Birth: 30/05/1994 Marital status: Married
Nationality: Indian
Gender: Male

Research Interests

Material Science, Nanomaterial synthesis and Characterization and Device application.

Employment History

December 2020 – till date **Assistant Professor-stage I**, Department of Physics, Jengraimukh College, Majuli, Assam, India

Education and Qualification

- 2018 – 2024 **Ph.D.**, Rajiv Gandhi University, Arunachal Pradesh, India
Thesis title: *An Investigation on Quasi-Type-II nature of CdSe/ZnSe Core-Shell Nanostructure for possible optoelectronic applications.*
Supervisor : Prof. Pradip Kumar Kalita
- 2015 – 2017 **M.Sc. Physics, specialization: Condensed Matter Physics**, Rajiv Gandhi University, Arunachal Pradesh, India (% of marks: 75.3)
- 2012 – 2015 **B.Sc. Physics (Honours)**, Dibrugarh University, Assam, India (% of marks: 77.21)
- 2010 – 2012 **HS (10+2)**, Assam Higher Secondary Education Council, India (% of marks: 75.8)
- 2010 **Matriculation**, Secondary Education Board of Assam, India (% of marks: 83.5)
- 2019 Cleared State level eligibility test (**SLET**) for Lectureship, N E Region 2019

Awards and Achievements

- 2010 Recipient of Anundoram Borooh award in HSLC examination in 2010.
- 2011 OIL Merit Scholarship 2010 for excellence in HSLC examination.

Skills

Languages	Reading, writing and speaking competencies for English, Assamese and Hindi
Coding	Python, C, C++, Mathematica
Misc.	Academic research, teaching, solar cell simulation with SCAPS-1D software, optoelectronic Device simulation using SILVACO TCAD.

Published Journal Articles

- 1 **Handique, K.C.**, Kalita, P.K. Effects of cadmium ion concentration on the optical and photo-response properties of CdSe/PVP nanocomposites for white light sensing application. Appl. Phys. A 126, 755 (2020). <https://doi.org/10.1007/s00339-020-03934-3>
- 2 Barman, B., **Handique, K. C.**, Nanung, Y., & Kalita, P. K. (2021). Synthesis and characterization of chemically synthesized CuSe nanoparticles for photovoltaic application. Materials Today: Proceedings, 46, 6213-6217. <https://doi.org/10.1016/j.matpr.2020.04.658>
- 3 **Handique, K. C.**, Barman, B., & Kalita, P. K. (2024). Effect of Zn²⁺ ion concentration on the optoelectronic properties of chemically synthesized ZnSe nanorods. Physica B: Condensed Matter, 674, 415571. <https://doi.org/10.1016/j.physb.2023.415571>
- 4 **Handique, K.C.**, Kalita, P.K., Barman, B. et al. Photo-induced single-electron tunnelling based Coulomb staircase effect observed at high applied bias in ZnSe/CdSe core-shell quantum dots. Opt Quant Electron 56, 357 (2024). <https://doi.org/10.1007/s11082-023-05920-4>
- 5 **Handique, K. C.**, Siboh, D., Nanung, Y., Barman, B., & Kalita, P. K. (2021). Effect of temperature on the optical properties of chemically synthesized CdSe nanostructures. Materials Today: Proceedings, 46, 6312-6317. <https://doi.org/10.1016/j.matpr.2020.05.444>
- 6 Barman, B., **Handique, K. C.**, & Kalita, P. K. (2024). Observation of negative differential resistance (NDR) in chemically synthesized CuGaSe₂ nanorods. Materials Letters, 357, 135638. <https://doi.org/10.1016/j.matlet.2023.135638>
- 7 Barman, B., **Handique, K. C.**, & Kalita, P. K. (2024). Optoelectronic characterization of chemically synthesized Cu_xIn_{1-x}Se₂ nanostructure for suitable application as photoconductive device. Journal of Physics and Chemistry of Solids, 184, 111700. <https://doi.org/10.1016/j.jpcs.2023.111700>
- 8 Mahanta, R., Chetri, P., & **Handique, K. C.** (2025). Investigation of optoelectronic properties of spin-coated SnO₂/Al₂O₃ nanoflower thin film. OPTOELECTRONICS AND ADVANCED MATERIALS-RAPID COMMUNICATIONS, 19(1-2), 111-124.
- 9 Barman, B., **Handique, K. C.**, & Kalita, P. K. (2023). Optoelectronics characteristics of chemically synthesized Cu (In_{1-x}Ga_x) Se₂ based Schottky and heterojunctions. Optical Materials, 145, 114420. <https://doi.org/10.1016/j.optmat.2023.114420>
- 10 **Handique, K. C.**, Barman, B., & Kalita, P. K. (2023). Photo-response in chemically

synthesized ZnSe nanorod for its application as photosensor. Physica Scripta, 98(11), 117001. DOI 10.1088/1402-4896/acfea8

- 11 Pathak, B., Sarma, N., **Handique, K.C.** et al. Nanomaterials for electrochemical CO₂ conversion: mechanistic insights and emerging hybrid strategies. emergent mater. 8, 5387–5424 (2025). <https://doi.org/10.1007/s42247-025-01283-6>
- 12 Handique, K. C., & Kalita, P. K. (2020). Effect of Weak Confinement on the Optical Properties of Chemically Synthesized ZnS Nanoparticles. [https://doi.org/10.21272/jnep.12\(4\).04015](https://doi.org/10.21272/jnep.12(4).04015)

Conference paper Presented (International)

- 1 Presented a paper entitled '**Optical properties of poly-vinyl pyrrolidone encapsulated PbS/CdS core-shell quantum dot**' at 'Advanced Materials for Energy Science and Technology (AMEST-2019)' organized by Department of Energy Engineering, NorthEastern Hill University, Shillong from 26th Feb to 28th Feb, 2019.
- 2 Presented a paper entitled '**Structural and optical properties of CdS, PbS and their core-shell nanostructures**' at 'Second International Conference on Advances in Electrical, Electronic and System Engineering' organized by Gauhati University in collaboration with International Centre for Theoretical Physics, Malaysia from 2nd to 3rd Nov 2019.
- 3 Presented a paper entitled '**Synthesis and characterization of Cu doped CdS for photovoltaic application**' at 'Recent Trend and Practices in Science, Technology, Management and Humanities for Sustainable Rural Development (STMH - 2019)' organized by University of Science and Technology, Meghalaya from 6th to 7th Sept 2019.
- 4 Presented a paper entitled '**Numerical simulation study of CH₃NH₃SnBr₃ based solar cell**' at the International conference on Emerging Trends in Basic and applied Science (ETBAS-2025) organized by DDR college, Chabua on 8th to 9th August 2025.

Conference paper Presented (National)

1. Presented a paper entitled '**Effect of weak confinement on the optical properties of chemically synthesized ZnS quantum dots**' in the National Conference 'Recent Advances in Applied Science (RAAS'2019)' organized by Department of Applied Science, Gauhati University from 17th to 18th May, 2019.
2. Presented a paper entitled '**Synthesis and characterization of CdS/PbS core-shell nanocomposite for photovoltaic application**' in the National Conference 'Materials, Condensed Matter & Theoretical Physics (NCMCTP-2018)' organized by Department of Physics, ADP College, Assam from 20th to 21st Dec, 2018.
3. Presented a paper entitled '**Design and simulation studies of CdTe and CIGS based solar cell**' in the national conference 'XI Biennial National Conference of Physics Academy of North-East(PANE-2018)', organized by Department of Physics, Assam

University, Diphu Campus(AUDC) from 21st to 23rd Nov, 2018.

4. Presented a paper entitled '**A Comparative Microstructural study on Chemically synthesized ZnSe nanoparticles using Various Techniques**' in the 'National Conference on Emerging Trends in Physics' organized by Department of Physics, Tezpur University, Assam from 16th to 17th June, 2021.

Books and Chapters

- 1 **K. C. Handique**, B. Barman, Y. Nanung, D. Siboh and P. K. Kalita (2019). "Synthesis and characterization of CdS/PbS core-shell nanocomposites for photovoltaic application" in the book "Advances in nuclear Physics and Condensed Matter" edited by Lakshmi K. Singh, published by Eastern Book House Publishers (India). (ISBN- 9789388881203).
- 2 **K.C. Handique**, M. P. Borah, N. M. Nath & P. K. Kalita, (2020) "Design and simulation studies of CdTe and CIGS based solar cells using SCAPS-1D" in the book "Frontiers of basic Physics and Applications", Knowledge Publication, ISBN- 978-81-933014-8-7.
- 3 Nanung, **K. C. Handique**, B. Barman, L. Tangjang and P. K. Kalita, (2022) "Structural and optical characterization of CdS/ZnS nanostructures" in the book 'Advances in Electronic Materials' Knowledge Publication, ISBN- 978-81-948719-8-9.
- 4 R. Narzary, S. Ngadong. T. Chekke, **K. C. Handique** and U. Das, (2022) "Effect of Sodium Hydroxide (NaOH) on the size of nanostructured Tin Oxide (SnO₂) synthesized using Hydrothermal Method" in the book 'Advances in Electronic Materials' Knowledge Publication, ISBN- 978-81-948719-8-9.
- 5 **K.C. Handique**, R. Mahanta, (2023) "Synthesis and Characterisation of PVP capped ZnSe Quantum Dots" in the book 'SPECTRUM-A Hybrid Edited Book of Chemical, Mathematical and Physical Sciences' Grass Publication, ISBN: 978-81-965169-8-7.
- 6 R. Mahanta, **K.C. Handique** A Study on Structural and Optical Properties of PVA/(SnO₂ Al₂O₃) Nanocomposite Membrane for Green Optoelectronics, in the book 'SPECTRUM-A Hybrid Edited Book of Chemical, Mathematical and Physical Sciences' Grass Publication, ISBN: 978-81-965169-8-7.

Workshop Attended

1. Participated in the workshop on "**LATEX Documents 2019**" organized by the Department of Physics, Assam Don Bosco University from 29th to 30th March, 2019.
2. Participated at the "**Inter-University Accelerator Centre (IUAC) Acquaintance Workshop**" organized by Department of Physics, Rajiv Gandhi University, Doimukh, Arunachal Pradesh on 25th April, 2019.
3. Participated in "**One Day Awareness Workshop on Intellectual Property Rights(IPR)**" organized by Patent Information Centre under Arunachal Pradesh State
4. Council for Science and Technology (Department of Science and Technology), Govt. of Arunachal Pradesh in collaboration with Rajiv Gandhi University on 26th April, 2019.

Journal peer-reviewer

Springer, Elsevier and IOP Science

Academic responsibilities and experiences

1. Coordinator of **Nanomaterial Research Laboratory** at Department of Physics, Jengraimukh College.
2. Served as HoD, Physics, jengraimukh College from 2020 to 2023
3. Supervised 05 students in undergraduate level project work in Nanomaterial characterisation and Solar cell simulation.

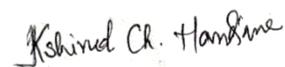
Professional Courses/ Programmes Attended

- 2022 Two - week interdisciplinary **refresher course** in “advanced research methodology”, Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, Teaching Learning Centre, Ramanujan College University of Delhi.
- 2022 One-week online **Faculty Development Programme** on “NATIONAL EDUCATION POLICY 2020” Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, Teaching Learning Centre, Ramanujan College University of Delhi.
- 2022 Online-one week **Faculty Development Programme** on “Soft Skills”. Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, Teaching Learning Centre, Ramanujan College University of Delhi.
- 2021 **FDP** on "Applications of Machine Learning". AICTE Training and Learning (ATAL) Academy, Rajiv Gandhi University.
- 2021 **Faculty Development Program** on fundamentals of Novel Materials, AICTE Training and Learning (ATAL) Academy, Tripura University.
- 2021 Advanced **FDP** on "**fundamentals of Novel Materials**" AICTE Training and Learning (ATAL) Academy, Tripura University.
- 2021 Four-Week **Induction/Orientation** Programme for “Faculty in Universities/Colleges/Institutes of Higher Education” Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching, Teaching Learning Centre, Ramanujan College University of Delhi.

Declaration

I hereby declare that the information in this curriculum vitae and the additional information furnished is correct and true to the best of my knowledge.

September 12, 2025
Majuli, Assam



Kshirud Chandra Handique