

Curriculum Vitae

Personal Details

Name **Ms. Joyanti Halder**

Sex and Marital Status Female, Single

Present address Department of Physics, IIT Kharagpur,
Kharagpur – 721302, West Bengal, India

Contact joyantiedu94@gmail.com,
joyanti.phy@iitkgp.ac.in



Academic Background

Program	Institute/College	Subject
Doctor of philosophy	Indian Institute of Technology Kharagpur	Electrochemistry
Master of Science (M.Sc)	Lady Brabourne College, under the University of Calcutta	Physics
Bachelor of Science (B.Sc.)	West Bengal State University	Physics (major), Chemistry, Mathematics
Higher Secondary	Basirhat Naihati N.C.M. Siksha Niketan	Science
Secondary	Basirhat Naihati N.C.M. Siksha Niketan	Science and Arts

Research Experience

- 09/07/2019 – present Ph.D. thesis under the supervision of Prof. Amreesh Chandra in the department of Physics, Indian Institute of Technology (IIT) Kharagpur, India
Title of the thesis is “*High performance nanostructured metal oxide-based supercapacitors starting from single metal oxides (NiO, Fe₂O₃) towards mixed ternary ferrites (Ni_{1-x}Co_xFe₂O₄).*”
- 10/05/2016- 2/04/2017 Project work for fulfillment of M.Sc. degree in physics at Lady Brabourne College entitled as “Study of phase behavior of 2-D Lennard Jones System” under the supervision of Dr. Srabani Chakrabarty nee Sarkar (Associate professor, Department of Physics, Lady Brabourne College, Kolkata).

Research Interest

Nanomaterial synthesis, Electrochemistry, Metal ion Batteries, Supercapacitors, Electrochemical Sensors, Energy Storage.

Publications and Book Chapter

14. **Joyanti Halder**, Puja De, Debabrata Mandal, and Amreesh Chandra; “Bricks of Co, Ni doped Fe₃O₄ as high performing pseudocapacitor electrode”, **Journal of Energy Storage**, 2023, 58, 106391.

13. **Joyanti Halder**, Sudipta Biswas, Ananya Chowdhury, Debabrata Mandal, Sakshi Kansal, Surbhi Priya, Puja De, Alok. K. Srivastava, Amreesh Chandra, “Magnetic Supercapacitors-Particle Morphology Have Significant Impact on the Electrochemical Performance”, **The Journal of Physical Chemistry C**, 2023, 127(30), 14623-14635.

12. **Joyanti Halder**, Puja De, Debabrata Mandal, Rahul R, Ashok Bera and Amreesh Chandra; “Synergistic contribution of redox additive electrolytes to significantly increase the performances of hybrid supercapacitors”, **ACS Applied Electronic Materials (Under Review)**, 2024, Manuscript ID: el-2024-00217c.

11. **Joyanti Halder**, Rahul R, Sakshi Kansal, Puja De, and Amreesh Chandra; “High performing in-situ grown FeVO₄@PANI composite for low-cost aqueous Al-ion battery”, (**Under submission**).

10. Puja De, Surbhi Priya, **Joyanti Halder**, Alok K. Srivastava, and Amreesh Chandra; “Highly Crystalline and Ordered Microporous Metal-Organic Framework for Aqueous Aluminum Ion Batteries and Hybrid Devices: Use of Redox Additives to Induce Significant Performance Enhancement”, **ACS Applied Materials and Interface (Under Review)**, 2024, Manuscript ID: am-2023-13755t.

9. Puja De, **Joyanti Halder**, Surbhi Priya, Alok Kumar Srivastava, and Amreesh Chandra; “Two-Dimensional V₂O₅ Nanosheets as an Advanced Cathode Material for Realizing Low-Cost Aqueous Aluminum-Ion Batteries”, **ACS Applied Energy Materials**, 2023, 6(2), 723-756.

8. **Joyanti Halder**, Puja De and Amreesh Chandra, “High performance in-situ grown FeVO₄@PANI composite as a potential cathode material for low-cost aqueous Al-ion battery”, **ACS applied Materials and Interface (Under submission)** 2023.

7. **Joyanti Halder**, Puja De, Debabrata Mandal and Amreesh Chandra, “High performance asymmetric Ni_{0.5}Co_{0.5}Fe₂O₄//GO supercapacitor with enhanced electrochemical performance employing K₃[Fe(CN)₆] and KI as redox additive electrolytes”, **Electrochimica Acta (Under Submission)** 2023.

6. Puja De, Lalit Bharti, **Joyanti Halder**, Surbhi Priya, Alok. K. Srivastava, Amreesh Chandra, “Electrochemically Activated Mn₃O₄ Nanoparticles as Higher Performing Electrode than MnO₂ for Al-

ion Batteries – An Insight into the Crystallographic Changes Caused by Al³⁺ Intercalation”, **Electrochimica Acta**, 2023, 469, 143248.

5. Surbhi Priya, **Joyanti Halder**, Debabrata Mandal, Ananya Chowdhury, Trilok Singh, and Amreesh Chandra; “Hierarchical SnO₂ nanostructures for potential VOC sensor”, **Journal of Materials Science**, 2021, 56, 9883-9893.

4. Ananya Chowdhury, Sudipta Biswas, Vikas Sharma, **Joyanti Halder**, Abyaya Dhar, Baranidharan Sundaram, Brajesh Dubey, Poornachandra Sekhar Burada, Amreesh Chandra; “High performance magnetic pseudocapacitors-Direct correlation between specific capacitance and diffusion coefficients”, **Electrochimica Acta**, 2021, 397, 139252.

3. Debabrata Mandal, **Joyanti Halder**, Puja De, Ananya Chowdhury, Sudipta Biswas, and Amreesh Chandra; “2D Flower-like Porous Nanostructures of Layered SnS₂ for High-Performance Supercapacitors: Correlating Theoretical and Experimental Studies”, **ACS Applied Energy Materials**, 2022, 5, 7735 – 7747.

2. Puja De, **Joyanti Halder**, Chinmayee Chowde Gowda, Sakshi Kansal, Surbhi Priya, Satvik Anshu, Ananya Chowdhury, Debabrata Mandal, Sudipta Biswas, Brajesh Kumar Dubey, and Amreesh Chandra; “Role of porosity and diffusion coefficient in porous electrode used in supercapacitors– Correlating theoretical and experimental studies”, **Electrochemical Science Advances**, 2023, 3, e2100159.

1. Sakshi Kansal, **Joyanti Halder**, Debabrata Mandal, R Rahul, Surbhi Priya, Puja De, Vikas Sharma, Alok Kumar Srivastava, Trilok Singh, and Amreesh Chandra; “High performing supercapacitors using Cr₂O₃ nanostructures with stable channels-theoretical and experimental insights”, **Materials Science and Engineering: B**, 2023, 293, 116438.

Published Book Chapter:

1. **Magneto-Electric Supercapacitors**, “*Handbook of Nanocomposite Supercapacitor Materials IV: Next-Generation Supercapacitors*”, 2023, **Springer International Publishing**, 265-294.

Conference and Presentation

7. **Joyanti Halder**, Puja De, Debabrata Mandal, and Amreesh Chandra; “Structural and electrochemical investigation of Co-doped NiFe₂O₄ for use in high-performance supercapacitors”, EMRS Spring Meeting 2023, May 29- June 2, Strasbourg, France. **(Poster Presentation)**

6. **Joyanti Halder**, Puja De, Debabrata Mandal, and Amreesh Chandra; “Brick like particles of Ni_{1-x}Co_xFe₂O₄ for use in high power pseudocapacitors”, 66th DAE Solid State Physics Symposium,

December 18-22, 2022, Birla Institute of Technology Mesra, Ranchi, Jharkhand, India. **(Poster Presentation)**

5. Joyanti Halder, Sudipta Biswas, Ananya Chowdhury and Amreesh Chandra; “Improvement of the specific capacitance of α -Fe₂O₃ hollow sphere under external magnetic field”, 9th Interdisciplinary Symposium on Materials Chemistry (ISMC-2022), December 7-10, DAE Convention Centre, Anushaktinagar, Mumbai. **(Poster Presentation)**

4. Joyanti Halder, and Amreesh Chandra; “Morphology dependent variation of the specific capacitance of NiO: Explanation using a simple theoretical model”, 1st International Conference on Supercaps & Batteries – 2022, March 28-30, Department of Physics, IIT Kharagpur, West Bengal, India. **(Poster Presentation)**

3. Joyanti Halder, and Amreesh Chandra, “Synergistic combination of metal oxides for improving the charge storage capability of magnetic supercapacitor”, 14th National Conference on Solid State Ionics (NCSSI-14) December 16-18, 2021, Department of Physics & Astrophysics, University of Delhi, Delhi-110 007. **(Oral Presentation)**

2. Joyanti Halder, and Amreesh Chandra, “Particle morphology dependent tuning of magnetic supercapacitors: Correlating with change in the diffusion behaviour of electrolyte ions”, International Conference on Energy and Advanced Materials (ICEAM)-2021, October 21-23, 2021, Department of Physics & Materials Science & Engineering, Jaypee Institute of Information Technology, Noida, Uttar Pradesh, India. **(Oral Presentation)**

1. Joyanti Halder, Sudipta Biswas, Ananya Chowdhury, and Amreesh Chandra, “Improved supercapacitor performance of α -Fe₂O₃ hollow sphere under external magnetic field: Correlating with the diffusion of electrolyte ions”, 65th DAE Solid State Physics Symposium, 15 – 19 December, 2021, Bhabha Atomic Research Centre, Mumbai, India. **(Poster Presentation)**

Academic Achievements

- ❖ Received “Best Woman Poster Presenter Award” in International Conference on Supercapacitors & Batteries-India 2022.
- ❖ Selected for "Innovation in Science Pursuit for Inspired Research (INSPIRE)” scholarship, 2012 (being among top 1% students).
- ❖ Qualified JEST 2019, and GATE 2017, 2018, 2019 exam in PHYSICS.
- ❖ Qualified CSIR-UGC NET JUNE 2019 in PHYSICS (UGC JRF, AIR - 95).

Teaching Experiences

June 2023 - December 2023: Teaching assistant in two *NPTEL (National Programme on Technology Enhanced Learning)* courses, (i) Physics of Functional Materials & Devices, (ii) Physics of Renewable Energy Systems.

January, 2020 – June, 2020: Teaching assistant in undergraduate experimental physics lab in Indian Institute of Technology (IIT) Kharagpur, India.

July, 2020 – July, 2021: Teaching assistant in undergraduate theoretical physics class of a 4-credit course, “Physics of waves” in Indian Institute of Technology (IIT) Kharagpur, India.

January, 2022 – June, 2022: Teaching assistant in undergraduate theoretical physics class of a 4-credit course, “Physics of waves” in Indian Institute of Technology (IIT) Kharagpur, India.

July, 2022 – present: Teaching assistant in undergraduate experimental physics lab in Indian Institute of Technology (IIT) Kharagpur, India.