






PROF. AMREESH CHANDRA

-  Department of Physics,
Indian Institute of Technology Kharagpur,
Kharagpur-721302, West Bengal, India
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PROFESSIONAL EXPERIENCE

Professor

Feb. 2020 – onwards

Department of Physics
Indian Institute of Technology,
Kharagpur, India

Associate Professor,

Aug. 2014 – Jan. 2020

Department of Physics
Indian Institute of Technology,
Kharagpur, India

Assistant Professor

Jan. 2009 – Aug. 2014

Department of Physics
Indian Institute of Technology,
Kharagpur, India

Research Officer,

2007 - 2009

Physical Science,
University of Surrey, Guildford,
United Kingdom

Max Planck Post-Doctoral Fellow,

2005 – 2006

Max Planck Institute for Polymer
Research, Mainz, Germany

Senior Research Fellow

2002 - 2005

School of Materials Science and Technology,
Institute of Technology, B.H.U., Varanasi,
India

EDUCATION DETAILS

1. Ph.D. (2004)

Major Area: Ferroelectric Ceramics

Title: Structural Phase Transitions in (PbCa)TiO₃
Ferroelectric Ceramics

Institute: School of Materials Science and Technology,
Indian Institute of Technology, BHU, Varanasi.

2. Master of Science (M.Sc.) Physics (1998)

Specialization: Electronics

Institute: Department of Physics, Faculty of Science,
Banaras Hindu University, Varanasi.

3. Bachelor of Science (B.Sc.) Physics Honors (1996)

(Additional Subjects: Mathematics and Statistics)

Institute: Department of Physics, Faculty of Science,
Banaras Hindu University, Varanasi.

4. Intermediate (Class XII) Science (1993)

St. John's School, D.L.W., Varanasi.

5. High School (Class X) Science (1991)

St. John's School, D.L.W., Varanasi.

RESEARCH INTERESTS AND EXPERIENCE

25 Years

Broad Area: Functional Nanomaterials for Energy Devices

Sub-areas: Confined and Hollow Nanoparticles of Metals Oxides and Metal Sulfides,

Energy Storage Devices - Supercapacitors, Na-ion and Al-ion Batteries

Electrochemical Devices - Water splitting, Catalysis and Gas Sensing.

Carbon Footprint and Credit Calculations using Life Cycle Assessment Analysis (LCA) studies

Mutiferroics and Ferroelectric Ceramics

Structural Phase Transition using X-ray and Neutron Diffraction

THESIS AND DISSERTATION SUPERVISED

Ph.D.'s: **13 completed** (+ 9 ongoing)

MTech's: **18 completed** (+ 4 ongoing)

M.Sc.: **23 completed** (+ 2 ongoing)

AWARDS/ RECOGNITIONS/ ACHIEVEMENTS

1.0. **"Silver Medal"** (2023), Society of Materials Chemistry, for the contribution in the field of materials science.

2.0. **ENDEAVOUR EXECUTIVE FELLOWSHIP AWARD**, *Government of Australia*, 2018.

3.0. **ALEXANDER VON HUMBOLDT CONNECT FELLOWSHIP**, *AvH Foundation (Germany)*, 2013

4.0. **IIT FACULTY – DAAD EXCHANGE FELLOWSHIP**, *DAAD (Germany)*, 2012.

5.0. **MAX PLANCK INDIA FELLOWSHIP AWARD**, *Max Planck Society (Germany)*, 2010.

6.0. **YOUNG SCIENTIST RESEARCH AWARD**, *Department of Atomic Energy (DAE), India*, 2010.

7.0. **YOUNG SCIENTIST AWARD**, *Materials Science, Indian Science Congress Association, India*, 2004.

8.0. **YOUNG SCIENTIST AWARD**, *International Conference on Electroactive Polymers: Materials and Devices, Dalhousie, India*, 2004.

CONTRIBUTION AND ASSOCIATION WITH NATIONAL AND INTERNATIONAL COMMITTEE

- 1) **Expert Committee Member**, PLI scheme for Advanced Chemistry Cell (ACC) Battery Storage, Ministry of Heavy Industries (2023)
- 2) **Selection Committee Member**, QUAD Fellowship (2022), (2024)
- 3) **Expert Panel Member** for Screening of the Letter of Intent (LoI) received against the DST call on Integrated Clean Energy Material Acceleration Platform (IC-MAP) in the area of Materials, Devices & Sensors. (2020)

SPONSORED/FUNDED/CONSULTANCY PROJECTS/ RESEARCH

AS PRINCIPAL INVESTIGATOR

- ✓ AI4CPS
- ✓ BatteryLife2
- ✓ Uneverse Mobility

1. **Functional and Flexible Polymer nanocomposites using Hierarchical nano-metal oxides for defence application**

Sponsoring Agency: DRDO (India) (2022-2025)

TOTAL GRANT: ~Rs. 79.60 Lakhs

2. **Hierarchically nanostructured energy materials for next generation Na-ion storage systems and their use in renewable energy systems.**

Sponsoring Agency: DST (India) (2017-2022)

TOTAL GRANT: ~Rs. 94.5 Lakhs

3. **Head, Max Planck Partner Group on Hybrid Nanostructures for alternative energy systems**

Sponsoring Agency: IGSTC (India) and MPG(Germany) (2014-19).

TOTAL GRANT: ~Rs. 1.5 CRORES

4. **Next Generation Supercapacitors with High Energy Storage Capacity**

Sponsoring Agency: SGIRG Scheme, IIT Kharagpur (2014-16)

TOTAL GRANT: Rs. 25 LAKHS

5. **Use of Nanomaterials in Alternative Energy Systems**
Sponsoring Agency: Indo-UK UKIERI (2012-2014)
TOTAL GRANT: *UK POUNDS* 40,000 (~Rs. 36.00 Lakhs)
6. **Polymer composites for energy Systems**
Sponsoring Agency: Max Planck Society, Germany (2010-13)
TOTAL GRANT: *EUROS* 12,000 (Rs. 8.00 Lakhs)
7. **Structural Phase Transition Studies in Multifunctional Ceramics**
Sponsoring Agency: DAE-BRNS, BARC, Mumbai, India. (2010-2013)
TOTAL GRANT: ~ Rs. 21 LAKHS
8. **Multifunctional Ceramics and Polymer Composites: Their Synthesis and Characterization**
Sponsoring Agency: ISIRD, IIT Kharagpur, India (2010-2013)
TOTAL GRANT: ~Rs. 5.0 LAKHS

[B]Sponsored/Funded Projects undertaken as Co- Principal Investigator

1. **Extensional rheometer for microscale samples**
Sponsoring Agency: DST (India) (2013-16),
Total Grant: ~RS. 44.00 Lakhs
2. **Fist Project – To strengthen the post graduate teaching and research facilities in the department**
Sponsoring Agency: DST (India) (2011-16),
Total Grant: ~ RS. 365.00 Lakhs
3. **Hybrid Sodium –ion cell/ supercapacitor packs for light electric vehicles,**
Sponsoring Agency: MHRD India:
Total Grant: ~318 Lakhs
4. **Centre of Excellence on Energy Aware Urban Infrastructure**
Sponsoring Agency: SERB (DST):
Total Grant: ~17.5 Crores

**AWARDS/
ACCOLADES ALONG
WITH MY RESEARCH
TEAM**

- 1) **Satvik Anshu** and **A. Chandra**, **Best Oral Presentation Award** at 8th, KIIT, Bhubaneswar, Orissa, India-2024.
- 2) **Lalit Bharti** and **A. Chandra**, **Best Poster Presentation Award** at 15th National Conference on Solid State Ionics (NCSSI-15), BHU, Varanasi, India-2023.
- 3) **Sakshi Kansal** and **A. Chandra**, **Best Oral Presentation Award** at 15th National Conference on Solid State Ionics (NCSSI-15), BHU, Varanasi, India-2023.
- 4) **Rahul R** and **A. Chandra**, **Best Poster Presentation Award** at 1st International Conference on Supercapacitors and Batteries, SUPERBATS - 2022, IIT Kharagpur, India-2022.
- 5) **Satvik Anshu** and **A. Chandra**, **Best Oral Presentation Award** at SUPERBATS - 2022, IIT Kharagpur, India-2022.
- 6) **Sakshi Kansal** and **A. Chandra**, **Best Oral Presentation Award**, SUPERBATS - 2022, IIT Kharagpur, India-2022.
- 7) **Puja De** and **A. Chandra**, **Suresh Chandra Memorial Award**, SUPERBATS - 2022, IIT Kharagpur, India-2022.
- 8) **Surbhi Priya** and **A. Chandra**, **Best Poster Award** at International Conference on Supercapacitors and Batteries IIT Kharagpur, India-2022.
- 9) **Puja De**; **Debabrata Mandal**; **Sudipta Biswas**; **A. Chandra**, **Best Poster Award** at DAE-SSPS 2021 Symposium held online from Dec. 15-19, 2021.
- 10) **Debabrata Mandal** and **A. Chandra**, **Young Scientist Award**, at 107th Indian Science Congress held at GKVK Campus, Bangalore, Karnataka, INDIA-2020.
- 11) **Vikas Sharma** and **A. Chandra**, **Best Oral Presentation**, ICONN-2019, SRM IST, INDIA-2019
- 12) **Surbhi Priya** and **A. Chandra**, **Best Poster Presentation Award**, at 5th International Conference on Nanoscience and Nanotechnology, SRM IST, INDIA-2019
- 13) **Vikas Sharma** and **A. Chandra**, **Young Scientist Award**, at 7th International Conference on Electroactive Polymers (ICEP-2019), Udaipur, INDIA-2019
- 14) **Prasenjit Haldar** and **A. Chandra**, **Best Poster Presentation Award**, at International conference on Nanotechnology: Ideas, Innovations, and Initiatives-

2017 (ICN:3I-2017), IIT Roorkee, INDIA-2017

15) Prasenjit Halder and **A. Chandra**, **Best Poster Award**, 12th National Conference on Solid State Ionics (NCSSI-12) organized by Department of Physics BITS Pilani, Pilani Campus, Dec. 2017

16) Vikas Sharma and **A. Chandra**, **Best Poster Presentation Award** International Symposium on Functional Materials (ISFM-2018), organized by IIT Kanpur, Punjab University and University of Illinois Chicago at Chandigarh, April 2018.

17) Vikas Sharma and **A. Chandra**, **Best Poster Presentation Award**, at International conference on Nanotechnology: Ideas, Innovations, and Initiatives-2017 (ICN:3I-2017), IIT Roorkee, INDIA-2017

18) Inderjeet Singh, Sayan Dey, Sumita Santra, and **A. Chandra**, **SURESH CHANDRA MEMORIAL AWARD FOR Best Poster Presentation Award**, 6th International Conference on Electroactive Polymers and Ceramics held at IIT Kharagpur in Feb. 2017

19) Vikas Sharma and **A. Chandra**, **Best Poster Presentation Award**, Research Scholars Day, School of Nanoscience and Nanotechnology, IIT Kharagpur, 2016

20) Sushanta Lenka and **A. Chandra**, 3rd position in **Poster Presentation**, at International conference on Nanotechnology: Ideas, Innovations, and Initiatives-2017 (ICN:3I-2017), IIT Roorkee, INDIA-2017

21) Inderjeet Singh and **A. Chandra**, **Best Poster Presentation Award**, 100th Indian National Science Congress Meeting, Kolkata, 2013.

22) A. Singh and **A. Chandra**, **Young Scientist Award**, 100th Indian National Science Congress Meeting, Kolkata, 2013

23) A. Singh and **A. Chandra**, **Best Poster Presentation Award**, 5th International Conference on Electroactive Polymers: Materials and Devices, BHU, Varanasi, Nov. 2012.

24) J. Khera and **A. Chandra** **Best Poster Presentation Award**, 4th International Conference on Electroactive Polymers: Materials and Devices, Surujkund, Nov. 2010.

POSITION OF RESPONSIBILITY

Departmental and Institute Responsibilities

1. Rector Nominee
2. President TGS
3. Purchase Committee
4. DAC
5. PG Committee
6. M Tech Lab Incharge
7. B Tech Lab Incharge
8. Faculty Adviser
9. Faculty Adviser M Tech
10. Hackathon
11. Student Election
12. TedX
13. Vice Chairman
14. DSC Member

INVITED AND PLENARY TALKS/ PODCAST

1. 8th International Conference on Electroactive Polymers, **Plenary talk**, 2024
2. Advanced Materials for Batteries, **Special Invited talk**, 2024
3. 15th National Conference on Solid State Ionics, **Plenary talk**, 2023
4. Battery Generation Podcast, 2023
5. Karlsruhe Institute of Technology, **Invited talk**, 2023
6. European Materials Research Society, **Invited talk**, 2023
7. 14th National Conference on Solid State Ionics, **Invited talk**, 2022
8. Electrochemistry for Industry Health and Environment, **Invited talk**, 2023
9. National Workshop on Material Chemistry, 2023
10. SUPERCAPS & BATTERIES, **Convenor**, 2022
11. 5th International Conference on Nanoscience and Nanotechnology, **Invited talk**, 2019
12. International Conference on Electroactive Polymer, **Invited talk**, 2019

13. 6th International Conference on Functional Electroceramics and Polymers, **Convenor**, 2017
14. Materials Design and Modelling, **Convenor**, 2016
15. International Conference on 21st Century Energy Needs - Materials, Systems and Applications, **Member, Organizing Committee**, 2016
16. Photonics, **Member, Organizing Committee**, 2014
17. 6th National Conference on Solid State Ionics (NCSSI), **Convenor**, 2013
18. 6th India-Singapore Joint Physics Symposium, **Organizing Secretary**, 2013
19. International conference on Theoretical and Applied Physics (IC TAP), **Organizing Secretary**, 2011

PATENTS & PUBLICATIONS

Patents (04):

- 1) Bubble wrapping for protecting supercapacitors from external vibrations S. Biswas, D. Mandal, A. Chowdhury, V. Sharma, A. Chandra (2022).
- 2) Metal organic framework-based cathode materials for low-cost aqueous novel aluminum-ion batteries. P. De, J. Halder, D. Mandal, S. Priya, S. Kansal, S. Anshu, A. Chandra (2022)
- 3) Use of sodium iron phosphate (NaFePO₄) as battery material for e-cycle. S. Priya, S. Biswas, A. Chowdhury, D. Mandal, P. De, J. Halder, S. Kansal, S. Anshu, A. Chandra (2022)
- 4)

Journal Publications (129)

h-factor: 29

Citations: 2972

- 129) Marigold-like MoS₂@MOF-derived N-doped carbon as a stable and High-capacity anode material for sodium-ion batteries. S. Priya, R. Ravindran, P. De, D. Mandal, S. Mahato, S. Kansal, A. Chandra, **ACS Applied Energy Materials**, 7, 594-603 (2024).
- 128) Zinc stannate oxide perovskite nanomaterial based electrochemical detection of ammonia. P. Singh, D. Mandal, A. Chandra, T. Singh, **Sensors and Actuators A: Physical**, 366, 114955 (2024).
- 127) Hollow nanostructures of ternary Ce_{1-x}Cu_xO₂ for volatile organic compound sensing. D. Mandal, S. Priya, A. Chowdhury, A. K. Srivastava, A. Chandra, **ACS Applied Nano Materials**, 7 (1), 476-486 (2024).
- 126) Highly fluorescent graphene quantum dots as “turn off-on” nanosensor for detecting toxic metal ions to organic pollutant. D. Mandal, P. De, S. Khatun, A. N. Gupta, A. Chandra, **International Journal of Environmental Science and Technology**, 21 (2), 1637-1648 (2024).
- 125) Electrochemically activated Mn₃O₄ nanoparticles as higher performing electrode than MnO₂ for Al-ion batteries—An insight into the crystallographic changes caused by Al³⁺ intercalation. P. De, L. Bharti, J. Halder, S. Priya, A. Chandra, **Electrochimica Acta** 469, 143248 (2023).
- 124) Dimensionality effects of g-C₃N₄ from wettability to solar light assisted self-cleaning and electrocatalytic oxygen evolution reaction. S. K. Kuila, S. K. Guchhait, D. Mandal, P. Kumbhakar, A. Chandra, C. S. Tiwary, T. K. Kundu, **Chemosphere** 333, 138951 (2023).
- 123) Magnetic behavior of two-dimensional manganese telluride. C. C. Gowda, R. Tromer, P. Pandey, D. Chandravanshi, A. Chandra, K. Chattopadhyay, D. S. Galvao, C. S. Tiwary, **2D Materials**, 10 (4), 045006 (2023).
- 122) Magnetic supercapacitors-particle morphology have significant impact on the electrochemical performance. J. Halder, S. Biswas, A. Chowdhury, D. Mandal, S. Kansal, S. Priya, P. De, A. K. Srivastava, A. Chandra, **The Journal of Physical Chemistry C**, 127 (30), 14623-14635 (2023).
- 121) Hydrothermally grown SnS₂/Si nanowire core-shell heterostructure photodetector with excellent optoelectronic performances. S. Das, S. Pal, K. Larsson, D. Mandal, S. Giri, P. Banerji, A. Chandra, R. Basori, **Applied Surface Science**, 624, 157094 (2023).
- 120) Enhanced optoelectronic performance of silicon nanowire/SnS₂ core-shell heterostructure with defect passivation in SnS₂ by uv treatment. S. Das, S. Pal, D.

Mandal, P. Banerji, A. Chandra, R. Basori, *IEEE Transactions on Electron Devices*, 70(8), 4008-4013 (2023).

119) Superior-catalytic performance of Ni-Co Layered double hydroxide nanosheets for the reduction of p-nitrophenol. S. Kansal, P. Singh, S. Biswas, A. Chowdhury, D. Mandal, S. Priya, T. Singh, A. Chandra, *International Journal of Hydrogen Energy*. 48 (56), 21372-21382 (2023).

118) Electrochemical performance of K⁺ intercalated MnO₂ nano-cauliflowers and their Na-ion-based pseudocapacitors. A. Chowdhury, R. Shukla, K. Bhattacharyya, A. K. Tyagi, A. Chandra, V. Grover, *Materials Science and Engineering B*, 295, 116581-116592 (2023).

117) High performing supercapacitors using Cr₂O₃ nanostructures with stable channels-theoretical and experimental insights. S. Kansal, J. Halder, D. Mandal, R. Rahul, S. Priya, P. De, V. Sharma, A. K. Srivastava, T. Singh, A. Chandra, *Materials Science and Engineering B*, 293 116437 (2023).

116) Tuning Na₂Ti₃O₇ nanostructures for tailoring high-performance Na-ion supercapacitors. P. De, D. Mandal, S. Biswas, A. Kumar, S. Priya, B. K. Dubey, A. K. Srivastava, A. Chandra, *Energy & Fuels*, 37 (7), 5595-5606 (2023).

115) 2D flakes of Au decorated SnO₂ nanoparticles as electrode material for high performing Supercapacitor. S. Anshu, S. Priya, D. Mandal, R. Rahul, T. Singh, A. Chandra, *Journal of Physics D: Applied Physics*, 56 (20), 205501(2023).

114) Magneto-Electric supercapacitors. A. Chowdhury, S. Biswas, A. Dhar, J. Halder, D. Mandal, P. S. Burada, A. Chandra, *Handbook of Nanocomposite Supercapacitor Materials IV: Next-Generation Supercapacitors*, 331, (2023).

113) Bricks of Co, Ni doped Fe₃O₄ as high performing pseudocapacitor electrode. J. Halder, P. De, D. Mandal, A. Chandra, *Journal of Energy Storage*, 58, 106391 (2023).

112) X-ray photoelectron spectra, conductivity, and oxygen permeation characteristics of (Ba_{0.5}Sr_{0.5})(Fe_{1-x}Ce_x) O_{3-δ} (x= 0–1.0) perovskites. S. Chauhan, A. Chandra, S. K. Jaiswal, *Materials Chemistry and Physics*, 297, 127408 (2023).

111) Two-Dimensional V₂O₅ Nanosheets as an Advanced Cathode Material for Realizing Low-Cost Aqueous Aluminum-Ion Batteries. P. De, J. Halder, S. Priya, A. K. Srivastava, A. Chandra, *ACS Applied Energy Materials* 6 (2), 753–762 (2023).

110) Utilization of DNA and 2D Metal Oxide interaction for optical biosensor. P. Kumbhakar, I. D. Jana, S. Basu, S. Mandal, S. Banerjee, S. Roy, C. C. Gowda, A. Chakraborty, A. Pramanik, P. Lahiri, B. Lahiri, A. Chandra, P. Kumbhakar, A. Mondal, P. K. Maiti, C. S. Tiwary. *Physical Chemistry Chemical Physics*, 25, 17143-17153 (2023).

109) Time dependent exfoliation study of MoS₂ for its use as cathode material in high performing hybrid supercapacitors. S. Priya, D. Mandal, A. Chowdhury, S. Kansal, A. Chandra *Nanoscale Advances*, 5, 1172-1182 (2023).

108) Other applications of halide perovskites. S. Porwal, D. Kumar, S. Ghosh, S. Kansal, S. Priya, A. Chandra, T. Singh, *Low-Dimensional Halide Perovskites*, 301-333 (2023).

107) Green Synthesis of Sr²⁺ doped multiferroic BiFeO₃ nanoceramics using Aloe vera biotemplates and their characterizations. S. K. Mandal, P. Kiran, P. S. Rao, A. Chandra, *Journal of Alloys and Compounds*, 922, 166107, 1 (2022).

106) Perovskite Solar Cells: Assessment of the Materials, Efficiency, and Stability. B. Boro, S. Porwal, D. Kumar, S. Mishra, S. Ghosh, S. Kansal, A. Chandra, T. Singh, *Catalysis Research*, 2 (4), 1-48 (2022)

105) Carbon material produced by hydrothermal carbonisation of food waste as an electrode material for supercapacitor application: A circular economy approach. S Venna, H. B. Sharma, D. Mandal, H. P. Reddy, S. Chowdhury, A. Chandra, B. K. Dubey, *Waste Management & Research*, 40 (10), 1514-1526 (2022).

104) Understanding the electrocatalysis OER and ORR activity of ultrathin spinel Mn₃O₄. C. C. Gowda, A. Mathur, A. Parui, P. Kumbhakar, P. Pandey, S. Sharma, A. Chandra, A. K. Singh, A. Halder, C. S. Tiwary, *Journal of Industrial and Engineering Chemistry*, 113, 153-160 (2022).

103) Integrated energy generation and storage systems for low power device applications. S. Kansal, S. Priya, S. Porwal, A. Chandra, T. Singh, *Energy Storage*, e413 (2022).

102) Nano Ni_{1-x}Co_xO system: Composition dependent phase evolution and electrochemical behaviour. S. Banerjee, A Chowdhury, A. Chandra, V.

- Grover. *Materials Chemistry and Physics*, 286, 126202 (2022).
- 101) 2D Flower-like Porous Nanostructures of Layered SnS₂ for High-Performance Supercapacitors: Correlating Theoretical and Experimental Studies. D. Mandal, J. Halder, P. De, A. Chowdhury, S. Biswas, A. Chandra, *ACS Applied Energy Materials*, 5(6), 7735-7747 (2022).
- 100) Structure–property correlation in (1-y) Bi_{0.9}Ca_{0.1}FeO_{3-(y)}PbTiO₃(0.0 < y < 1.0) solid solutions. P. Tirupathi, S. K. Mandal, A. Chandra, *Journal of Electroceramics*, 48(4), 183-197 (2022).
- 99) Facile strategy of using conductive additive supported NaMnPO₄ nanoparticles for delivering high performance Na-ion supercapacitors. A. Chowdhury, S. Biswas, D. Mandal, A. Chandra, *Journal of Alloys and Compounds*, 163733 (2022).
- 98) High-performance, nitrogen-doped, carbon-nanotube-based electrochemical sensor for vitamin D3 detection. H. Bora, D. Mandal, A. Chandra, *ACS Applied Bio Materials* 5 (4), 1721-1730 (2022).
- 97) Redox mediator induced electrochemical reactions at the electrode-electrolyte interface: Making sodium-ion supercapacitors a competitive technology. A. Chowdhury, S. Biswas, T. Singh, A. Chandra, *Electrochemical Science Advances* 2 (1), e2100030, 3, (2022).
- 96) Graphene decorated LiMn₂O₄ Electrode Material for hybrid type energy storage devices. D. Mandal, L. Bharti, S. Biswas, A. Chandra, *Energy Storage*, e373 (2022).
- 95) Pseudo 2-dimensional nanostructures of metal oxides for high-performance supercapacitors. D. Mandal, S. Biswas, A. Chowdhury, A. Chandra, *Materials Advances*, 3 (14), 5987-5999 (2022).
- 94) Role of porosity and diffusion coefficient in porous electrode used in supercapacitors – Correlating theoretical and experimental studies. P. De, J. Halder, C. C. Gowda, S. Kansal, S. Priya, S. Anshu, A. Chowdhury, D. Mandal, S. Biswas, B. K. Dubey, A. Chandra, *Electrochemical Science Advances* 1, 1-15 (2022).
- 93) Stable Na-ion supercapacitor under non-ambient conditions using maricite-NaMnPO₄ nanoparticles. A. Chowdhury, S. Biswas, A. Dhar, P. S. Burada, A. Chandra, *Journal of Power Sources* 516, 230679 (2021).
- 92) Emerging two-dimensional tellurides. S. Siddique, C. C. Gowda, S. Demiss, R. Tromer, S. Paul, K. K. Sadasivuni, E. F. Olu, A. Chandra, V. Kochat, D. S. Galvão, P. Kumbhakar, R. Mishra, P. M. Ajayan, C. S. Tiwary, *Materials Today* 51, 402-426 (2021).
- 91) High performance magnetic pseudocapacitors-Direct correlation between specific capacitance and diffusion coefficients. A. Chowdhury, S. Biswas, V. Sharma, J. Halder, A. Dhar, B. Sundaram, B. K. Dubey and A. Chandra. *Electrochimica Acta* 397, 139252 (2021).
- 90) Anomalous structural behavior and antiferroelectricity in BiGdO₃: Detailed temperature and high-pressure study. R. Jana, A. Dutta, P. Saha, K. Mandal, B. Ghosh, A. Chandra, I. Das, G. D. Mukherjee, *Journal of Physics: Condensed Matter* 33, 495403 (2021).
- 89) Exploration of gold colloidal beyond trillion times dilution. C. S. Tiwary, P. Kumbhakar, V. Kumaravel, A. Pramanik, R. Chaudhary, S. Prasanth, J. Tripathi, A. Chandra, H. Tiwary, S. Singh *Chem Rxiv*, (2021).
- 88) Hierarchical SnO₂ nanostructures for potential VOC sensor. S. Priya, J. Halder, D. Mandal, A. Chowdhury, T. Singh, A. Chandra, *Journal of Materials Science*, 56 (16), 9883-9893 (2021).
- 87) Emerging 2D metal oxides and their applications. P. Kumbhakar, C. C. Gowda, P. L. Mahapatra, M. Mukherjee, KD Malviya, M. Chaker, A. Chandra, B. Lahiri, P. M. Ajayan, D. Jariwala, A. Singh, C. S. Tiwary, *Materials Today* 45, 142-168 (2021).
- 86) Scalable synthesis of atomically thin gallium telluride nanosheets for supercapacitor applications. S. Siddique, C. C. Gowda, R. Tromer, S. Demiss, A. R. S. Gautam, O. E. Femi, P. Kumbhakar, D. S. Galvao, A. Chandra, C. S. Tiwary. *ACS Applied Nano Materials* 4 (5), 4829-4838 (2021).
- 85) Convert waste petroleum coke to multi-heteroatom self-doped graphene and its application as supercapacitors. D. Mandal, P. L. Mahapatra, R. Kumari, P. Kumbhakar, A. Biswas, B. Lahiri, A. Chandra, C. S. Tewary. *Emergent Materials* 4 (2), 531-544 (2021).
- 84) Hierarchical NaFePO₄ nanostructures in combination with an optimized

- carbon-based electrode to achieve advanced aqueous Na-ion supercapacitors. S. Biswas, D. Mandal, T. Singh, A. Chandra, *RSC Advances* 11 (48), 30031-30039 (2021).
- 83) External vibrations can destroy the specific capacitance of supercapacitors—from experimental proof to theoretical explanations. S. Biswas, V. Sharma, T. Singh, A. Chandra, *Journal of Materials Chemistry*, A 9 (10), 6460-6468 (2021).
- 82) Theoretical model for magnetic supercapacitors—From the electrode material to electrolyte ion dependence. A. Chowdhury, A. Dhar, S. Biswas, V. Sharma, P. S. Burada, A. Chandra, *The Journal of Physical Chemistry*, C124 (49), 26613-26624 (2020).
- 81) Hierarchical cage-frame type nanostructure of CeO₂ for bio sensing applications: from glucose to protein detection. D. Mandal, S. Biswas, A. Chowdhury, D. De, C. S. Tiwary, A. N. Gupta, T. Singh, A. Chandra. *Nanotechnology*, 32 (2), 025504 (2020).
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- 79) Controlling reaction kinetics of layered zinc vanadate having brucite-like Zn–O layers supported by pyrovanadate pillars for use in supercapacitors. A. Chowdhury, R. Shukla, V. Sharma, S. Neogy, A. Chandra, V. Grover, A. K. Tyagi, *Journal of Alloys and Compounds*, 829, 154479 (2020).
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