Brief Biodata

Name: Dr. Bhanu Pratap Singh

Designation:	Chief Scientist & Professor AcSIR
DP No. and Name:	4.03: Advanced Carbon Products and Metrology
DU No. and Name:	4: Advanced Materials and Devices Metrology
Email:	bps@nplindia.org
Date of Joining CSIR-NPL:	13-08-2004
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Research Area/ Interest

Carbon Nanomaterials
Carbon Nanotubes
Graphene
Polymer Nanocomposites
Energy Storage
EMI Shielding
Ballistic Protection
Flexible Thermoelectrics

Educational Qualifications

Degree	Subject	University/ Institute	Year
PhD	Polymer Science &Technology	IIT Delhi	2014
M.Tech	Chemical Engineering	IIT Kanpur	2004
B. Tech	Chemical Engineering	Lucknow University/ Institute of Engineering and Technology, Lucknow	2002

Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
Scientist B (Junior Scientist)	CSIR-National Physical Laboratory, New Delhi	13-08-2004	12-08-2007	R&D on Advanced Carbon Products
Scientist C (Scientist)	CSIR-National Physical Laboratory, New Delhi	13-08-2007	12-08-2011	R&D on Advanced Carbon Products
Scientist EI (Senior Scientist)	CSIR-National Physical Laboratory, New Delhi	13-08-2011	12-08-2014	R&D on Advanced Carbon Products
Principal Scientist	CSIR-National Physical Laboratory, New Delhi	13-08-2014	12-08-2018	R&D on Advanced Carbon Products
Senior Principal Scientist	CSIR-National Physical Laboratory, New Delhi	13-08-2018	12-08-2024	R&D on Advanced Carbon Products
Chief Scientist	CSIR-National Physical Laboratory, New Delhi	13-08-2024	Till Date	R&D on Advanced Carbon Products

No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Papers in Conferences	Books	Total
157	10	107	02- Book 14- Book Chapters	290

Selected Publications

1. Sangita Tripathy, Gaurav Singh Chauhan, Jeevan Jyoti, Sushant Sharma, Sanjay R Dhakate, **Bhanu Pratap Singh*,** Viscoelastic and thermal properties of unzipped multiwalled carbon nanotubes reinforced polyamide-6 composites Diamond and Related Materials, 151, Article No. 111766, 2025

2. Manoj Sehrawat, Vasundhara Singh, Mamta Rani, Chahek Kalra, Sony Bharadwaj, Rashmi Rani, Aarti Bisht, **Bhanu Pratap Singh*,** Nano-Welded Carbon Nanotube Sponges for Efficient Oil Spill Remediation Journal of Cleaner Production, 467, Article No. 142841, 2024

3. Rashmi Rani, Manoj Sehrawat, Ajay Kumar Verma, Mamta Rani, Bhasker Gahtori, Pankaj Kumar, Sanjay R Dhakate, **Bhanu Pratap Singh*,** Surfactant-Mediated Control of Polyethylenimine Dopant for Enhanced Thermoelectric Performance of Carbon Nanotube Buckypaper for Varied Device Configurations, ACS Applied Energy Materials, 7(16), 6996-7005, 2024

4. Manoj Sehrawat, Mamta Rani, Sushant Sharma, Sony Bharadwaj, Brian G Falzon, **Bhanu Pratap Singh*,** Floating catalyst chemical vapour deposition (FCCVD) for direct spinning of CNT aerogel: A review, Carbon, 219, 118747, 2024

5. Mamta Rani, Ananya Aggarwal, Manoj Sehrawat, Sony Bharadwaj, Rashmi Rani, Gaurav Singh Chauhan, **Bhanu Pratap Singh***, Enhancing Structural Integrity and Adsorption Performance of Carbon Nanotube Buckypaper for Water Remediation through Innovative Densification StrategySurfaces and Interfaces, 51, Article No 104636, 2024

6. Mamta Rani, Manoj Sehrawat, Sushant Sharma, Sony Bharadwaj, Gaurav Singh Chauhan, SR Dhakate, **Bhanu Pratap Singh*,** Carbon nanotube-based soft body armor: Advancements, integration strategies, and future prospects, Diamond and Related Materials, 118, Article No. 111446, 2024

7. S Bharadwaj, TK Gupta, GS Chauhan, M Sehrawat, A Kumar, SR Dhakate, **B.P. Singh***, Long length MWCNT/TPU Composite Materials for Stretchable and Wearable Strain Sensors, Sensors and Actuators A: Physical, 357, Article No. 114364, 2023

8. Mamta Rani, Manoj Sehrawat, Sushant Sharma, **Bhanu Pratap Singh***, Recent advancement and challenges in multifunctional carbon nanotube buckypaper and its composites for energy storage and conversion applications, Journal of Energy Storage, 73, Article No. 109063, 2023

9. Mamta Rani, Manoj Sehrawat, Rashmi Rani, Bhasker Gahtori, **B.P. Singh***, Tailoring the physical characteristics of buckypaper via controlling the surfactant concentration Surfaces and Interfaces, 37, Article Number. 102713, 2023

10. Pallvi Dariyal, **Bhanu Pratap Singh***, Gaurav Singh Chauhan, Manoj Sehrawat, Sushant Sharma, Ashok Kumar, Sanjay Ranganth Dhakate , Aerosol based synthesis of highly conducting carbon nanotube macro assemblies by novel mist assisted precursor purging system, Journal of Alloys and Compounds , 925, Article No 166634, 2022

11. Pallvi Dariyal, **Bhanu Pratap Singh*,** Gaurav Singh Chauhan, S.R. Dhakate, Localized Liquid Zones Assisted Highly Crystalline Single Wall Carbon Nanotube Sheets: Implications for Conducting Shields in Coaxial Cables, ACS Applied Nano Materials, 5(8),11964–11972, 2022

12. M. Sehrawat, M. Rani, Pallvi Dariyal, S. Bharadwaj, S.R. Dhakate and **B. P. Singh***, Highly Conducting CNT Aerogel Synthesized via Inert FC-CVD Technique: A Step towards Greener Approach, Reaction Chemistry & Engineering, 7, 1921-1930, 2022

13. Shailesh K. Yadav, S.R. Dhakate, **Bhanu Pratap Singh ***, Carbon nanotube incorporated

eucalyptus derived activated carbon-based novel adsorbent for efficient removal of methylene blue and eosin yellow dyes, Bioresource Technology,344, Article No. 126231, 2022

14. Sushant Sharma, Ishu Rawal, S.R. Dhakate, **B.P. Singh***, Synergistic Bridging Effects of Graphene Oxide and Carbon Nanotube on Mechanical Properties of Aramid Fiber Reinforced Polycarbonate Composite Tape, Composite Science and Technology, 199, 108370, 2020

15. Sushant Sharma, S.R. Dhakate, A. Majumdar, **B.P. Singh***, Improved static and dynamic mechanical properties of multiscale bucky paper interleaved Kevlar fiber composites, Carbon, 152, 631-642, 2019

16. Sushant Sharma, Vipin Kumar, Abhishek K Pathak, Tomohiro Yokozeki, Shailesh Kumar Yadav, Vidya Nand Singh, S.R. Dhakate, **Bhanu Pratap Singh*,** Design of MWCNT bucky paper reinforced PANI–DBSA–DVB composites with superior electrical and mechanical properties, Journal of Materials Chemistry C, 6(45), 12396-12406, 2018

17. Jeevan Jyoti, S.R.Dhakate, **Bhanu Pratap Singh***,Phase transition and anomalous rheological properties of graphene oxide-carbon nanotube acrylonitrile butadiene styrene hybrid composites, Composites Part B,154,337-350 , 2018

18. Sushant Sharma, Abhishek Pathak, Vidya Nand Singh, Satish Teotia, S. R. Dhakate, **B. P. Singh***, Excellent Mechanical Properties of Long Length Multiwalled Carbon Nanotube Bridged Kevlar Fabric, Carbon,137,104-11, 2018

19. Sushant Sharma, **Bhanu Pratap Singh***, Sampat Singh Chauhan, Jeevan Jyoti, Abhishek Kr. Arya, S.R.Dhakate, Vipin Kumar, Tomohiro Yokozeki Enhanced Thermomechanical and Electrical Properties of Multiwalled Carbon Nanotube Paper Reinforced Epoxy Laminar Composites, Composites Part A, 104, 129-138,2018

20. Indu Elizabeth, **Bhanu Pratap Singh*,**Thoyikkottu K..Bijoy, Venkata Rami Reddy, Gunasekaran Karthikeyan, Vidya Nand Singh, Sanjay R. Dhakate, Palanichamy Murugan, Sukumaran Gopukumar, In-situ Conversion of Multiwalled Carbon Nanotubes to Graphene Nanosheets: An Increasing Capacity Anode for Li Ion Batteries, Electrochimica Acta, 231, 255-263,2017

21. I. Elizabeth, A.K. Nair, **B.P. Singh,** S Gopukumar, Multifunctional Ni-NiO-CNT composite as high performing free standing anode for Li ion batteries and advanced electro catalyst for oxygen evolution reaction, Electrochimica Acta 230, 98-105, 2017

22. I. Elizabeth, **B.P. Singh**, S. Trikha, S. Gopukumar, Bio-derived hierarchically macro-meso-micro porous carbon anode for lithium/sodium ion batteries, Journal of Power Sources, 329, 412-421,2016

23. J. Jyoti, **B.P. Singh***, AK Arya, SR Dhakate, Dynamic mechanical properties of multiwall carbon nanotube reinforced ABS composites and their correlation with entanglement density, adhesion, reinforcement and C factor, RSC Advances, 6 , 3997-4006,2016

24. B. P. Singh*, D. K. Saket, A. P. Singh, Santwana Pati, T. K. Gupta, V. N. Singh, S. R. Dhakate, S. K. Dhawan, R. K. Kotnala and R. B. Mathur, Microwave shielding properties of Co/Ni attached to single walled carbon nanotubes,Journal of Materials Chemistry A,3,13203-13209,2015

25. Jeevan Jyoti, Surita Basu, **B.P Singh***, S.R Dhakate Superior mechanical and electrical properties of multiwall carbon nanotube reinforced acrylonitrile butadiene styrene high performance composites, Composites Part B, 83, 58-65, 2015

26. Ravi Gupta, **B. P. Singh***, V.N. Singh, T. K Gupta, R. B. Mathur Origin of radial breathing mode in multiwall carbon nanotubes synthesized by catalytic chemical vapor deposition, Carbon, 66,724-726, 2014

27. R. Kamaliya, **B.P. Singh*,** B.K. Gupta, V.N. Singh, T.K. Gupta, R Gupta, P Kumar, R. B.Mathur, Large scale production of three dimensional carbon nanotube pillared graphene network for bi-functional optical properties, Carbon, 78, 147-155, 2014

28.T.K. Gupta, **B.P.Singh***, V.N Singh, Satish Teotia, A.P. Singh, Indu Elizabeth, S.R Dhakate, S.K. Dhawan,R.B.Mathur, MnO_2 decorated graphene nanoribbons with superior permittivity and excellent microwave shielding properties, Journal of Materials Chemistry A, 2, 4256-4263, 2014

29. B.P. Singh*, Kamal Saini, Veena Choudhary, Satish Teotia, Shailaja Pande, P. Saini, R.B. Mathur, Effect of length of carbon nanotubes on electromagnetic interference shielding and mechanical properties of their reinforced epoxy composites, Journal of Nanoparticle Research, 16, Article No. 2161,2014

30. T.K. Gupta, **B.P. Singh**, RB Mathur, SR Dhakate, Multi-walled carbon nanotube–graphene–polyaniline multiphase nanocomposite with superior electromagnetic shielding effectiveness, Nanoscale 6 (2), 842-851, 2014

31. T.K. Gupta, **B.P Singh*,** S.R. Dhakate, V.N. Singh, R.B. Mathur, Improved Nanoindentation and Microwave Shielding Properties of Modified MWCNT Reinforced Polyurethane Composites, Journal of Materials Chemistry A, 1, 9138-9149, 2013

32. B. P. Singh*, Prasanta, Veena Choudhary, Parveen Saini, Shailaja Pande, V. N. Singh, R. B. Mathur, Enhanced microwave shielding and mechanical properties of high loading MWCNT–epoxy composites, Journal of Nanoparticle Research, 15, Article No. 1554, 2013

Patents

1. A process for the simultaneous growth of single-walled and multi-walled carbon nanotubes
   Indian Patent No.- 27219, dated 21/03/2016
   US Patent No. US7955663, dated 07/06/2011
   R.B.Mathur, C.Lal, T.L.Dhami, **B.P.Singh**, A.K.Gupta, and J.C. Ghawana

2. Light weight high electromagnetic interference (EMI) shielding material based on carbon nanotubes reinforced polymer composites
   Indian Patent No. 424358, dated 07-03-23.
   B.P.Singh, Parveen Garg, Shailaja Pande, R.B.Mathur, Parveen Saini and S.K.Dhawan

3. Carbon nanotubes-metal nanocomposites as flexible, free standing, binder free high performance anode for li–ion battery
   US Patent No. US 10,003,075, dated 19/06/2018,
   Indian Patent No. 341611, dated 15/07/2020
   P. H. Maheshwari, Indu Elizabeth, **B.P. Singh**, Chanchal Gupta, R.B.Mathur, S. Gopukumar

4. A new approach for the development of high strength carbon fiber/ carbon nanotubes reinforced polymer nanocomposites
   US Patent No. 10400074, dated 03.09.2019,
   Indian patent No- 482344, Dated 14/12/23
   B.P. Singh, Satish Teotia, S.R. Dhakate

Current Activities

(Not more than 100 words)

- Studies on Chirality control synthesis of SWCNTs by floating catalytic chemical vapour deposition (FC-CVD)
- Synthesis of meter scale Carbon nanotube yarn/sheet by FC-CVD
- Meter scale production of Carbon nanotube based flexible papers
- Carbon nanotube based light weight ballistic composites
- Carbon nanotube based light weight structural composites
- Carbon nanotube based flexible thermoelectric materials
- Carbon nanotube based flexible energy storage materials
- Carbon fiber polymer composites for Sports Applications

Honour(s)/Award(s)/ Fellowship(s)

1. **Raman Research Fellowship 2023-24** from Council of Scientific and Industrial Research for Visiting the Aalto University, Finland
2. **BD Bangur Award 2023** from The Indian Carbon Society
3. **NRDC- National Meritorious Invention Award** 2018 from National Research Development Corporation
4. **IEI–Young Engineer Award** for the Year 2017 in Metallurgical & Materials Engineering by the Institution of Engineers
5. **CSIR-Young Scientist Award** for the Year 2015 in Engineering Sciences
6. **HEAM Young Scientist Award** for the Year 2014 given by Indian Association of Hydrogen Energy and Advanced Materials
7. Listed in top 2% Scientists by Stanford University list for the year 2024,2023,2022,2021
8. Listed in Best Material Scientist from Researchers.com for the year 2024,2023,2022

Contributions to AcSIR

- Professor, Faculty of Engineering Sciences, Academy of Scientific and Innovative Research (AcSIR)
- Course Coordinator - Engineering Materials
- Course Coordinator – Materials Processing and Characterization
- Course Coordinator – Materials Metrology
- Senate Member of Academy of Scientific and Innovative Research (AcSIR) from Sept 2017 to Sept 2019
- Finance Committee member of Academy of Scientific and Innovative Research (AcSIR) from 28-12-2017.
- Supervised – 8 PhD and Under Supervision – 06 Students

Membership of Professional Societies/ Institutions

1. Joint Secretary of The Indian Carbon Society
2. Executive Council Member of Electron Microscopy Society of India-North Zone
3. Life Member of Metrology Society of India
4. Life Member of Materials Research Society of India
5. Life Member of The Society for Polymer Science, India
6. Life Member of Vigyan Bharti

Any other Information

(Not more than 100 words)

- Total Citations – 10900+, h-index-56, i-10 index-129
  As per Google scholar data
  https://scholar.google.co.in/citations?hl=en&user=NPS0rEQAAAAJ&view_op=list_works
- Technology/Know How Licensed
  Technology Name: Indigenous MWCNTs Synthesis by CVD and Development of Flexible MWCNTs Paper Therefrom
  Company Name: DDEV Plastik Daman
  Licensed date: 24-06-2024
- Academic Editor of Journal of Nanomaterials (Since 2014)
- International editorial advisory board member of Journal of Environmental Nanotechnology
- Member of BIS of Primary Cells & Batteries Sectional Committee, ETD10 (Since June 2021)