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Dr. Sukanta De

Assistant professor

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Date of Birth: 04 December 1978

Nationality: Indian

Gender : Male

Marital Status: Married

EMPLOYMENT DETAILS

- **Assistant Professor,** Department of Physics, Presidency University. May 2013 – present.
- **Ramanujan Fellow,** Department of Physics, Presidency University. October 2012-October 2017
- **Postdoctoral Fellow,** Department of Physics and CRANN, Trinity College Dublin, December 2006 – August 2012.

EDUCATION

2001- 2006 PhD, Indian Association for the Cultivation of Science, Jadavpur.

1999 – 2001 MSc in Physics, Calcutta University.

1996 - 1999 BSc in Physics, Calcutta University.

AWARDS

- Ramanujan Fellowship Dec 2011, DST, India.
- The Innovation Award 2010, CRANN, Trinity College Dublin
- National Eligibility Test' 2001 conducted by Council of Scientific and Industrial Research and University Grant Commission, Govt. of India.
- Graduates Aptitudes Test for Engineers 2001 conducted by Indian Institute of Technology.

PROFESSIONAL EXPERIENCE

Research: 17 years (22 years including PhD work)

Teaching: 11 years (UG and PG)

TEACHING:

Last 11 years I am teaching both theoretical and laboratory courses in post graduate and undergraduate level at Presidency University. So far I taught following courses

PG Courses:

1. Condensed Matter Physics (Special course: basic of liquid crystal and nonmaterial's)
2. Physics of Nanostructure Materials (Elective course)
3. General Lab
4. Condensed Mater Physics Lab

UG Courses:

1. Optics
2. Lab (Major course:3rd and 4th Semester)
3. Electricity and Magnetism (ED course)
4. Wave Optics (ED and GE course)
5. Lab (ED Course)
6. Physics of Materials (GenEd Course)
7. Modern Experimental and Theoretical Techniques (Skill Enhancement Course)
8. Mechanics and relativity (Minor Course)

RESEARCH

My research focuses on the large scale production of 2D materials for applications in flexible photo detector and in energy storage devices. During post doc I have worked on Fabrication of thin Transparent flexible and conducting (TCF) films from different nanostructure materials, such as single walled carbon nanotubes, Metallic nanowires, Graphene and their composites. At present I am working on nano composite based supercapacitors for energy storage applications. Also studying the impact of nano plastics and oxide nanomaterials on global biodiversity and ecosystem health.

PhD Student:

Sl. No	Name	Thesis Title	Status
1	Shibsankar Dutta	2D Nanomaterials and their Hybrids as Supercapacitor Electrodes for Energy Storage Applications	Completed , 2020 http://hdl.handle.net/10603/298651

2	Mrinmoy Chakraborty	Metal Oxide-Graphene oxide nano-composites thin film for optoelectronic applications	Ongoing
3	Nashiruddin Ahammed	Two Dimensional Bismuth Oxyhalide Based Hybrid Materials as Supercapacitor Electrode for Energy Storage Applications.	Ongoing
4	Suvamay Pramanik	"Energy Storage Device from Natural Biomass derived Carbon and their Nanocomposites for Sustainable Development towards Future."	Ongoing

Project Completed:

Sl. No.	Agency	Title of the Project(s)	Period	Amount in Lakh	Status
1.	SERB (DST)	Nanostructure materials and their hybrids/composites as super capacitor for energy storage and sensor applications	16/10/2012 - 15/10/2017	84.45	Completed
2.	SERB (DST)	2-D nanomaterials for flexible photo detector	16/10/2014 – 15/10/2017	24.12	Completed
3	UGC-DAE CSR, Kolkata	Transition Metal Oxychloride Nano-Sheets based Supercapacitor	01/06/2019 – 31/05/2022	15.30	Completed

List of Publications:

A. *Peer reviewed Journal*

1. "Combined impact of elevated temperature and zinc oxide nanoparticles on physiological stress and recovery responses of Scylla serrata", Sritama Baag, Nashiruddin Ahammed, Sukanta De, Sumit Mandal; **Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology** 275 (2024) 109764.

2. "Integrated application of morphological, anatomical, biochemical and physico-chemical methods to identify superior, lignocellulosic grass feedstocks for bioenergy purposes", T. Rahaman, S. Biswas, S. Ghorai, S. Bera, S. Dey, S. Guha, D. Maity, S. De, J. Ganguly, M. Das; **Renewable and Sustainable Energy Reviews** 187 (2023) 113738.

3. "Enhanced Electrochemical Performance of BiOCl Nanoflower-RGO Based Supercapacitor in the Presence of Redox Additive Electrolyte", S Dutta, S Pal, N Ahammed, S Sahoo, S Chatterjee, S De; ECS Journal of Solid State Science and Technology 12 (2023) 091002**.**

4. **"**High doses of nano-polystyrene aggravate the oxidative stress, DNA damage, and the cell death in onions" S. Maity , R. Guchhait , S. De , and K. Pramanick, ***Environmental Pollution*** 316 (2023)120611.

5. "Toxicological impacts of nanopolystyrene on zebrafish oocyte with insight into the mechanism of action: An expression-based analysis", A. Chatterjee , S. Maity , S. Banerjee , S. Dutta , M. Adhikari , R. Guchhait , C. Biswas , S. De , K. Pramanick; - ***Science of The Total Environment*** 830 (2022) 154796.

6. "A bichromophoric organic-inorganic semiconductor nanocomposite: device ready broad spectral response light-harvesting material with enhanced photoresponse" S Goswami, A Dey, S Ghosh, S Das, A Dutta, S Dutta, S De, K Dutta; **Colloids and Surfaces A: Physicochemical and Engineering Aspects** 597(2020) 124707.

7. "Light-weight flexible solid-state supercapacitor based on highly crystalline 2D BiOCl nanoplates/ MWCNT nanocomposites," Shibsankar Dutta, Shreyasi Pal, Debopriya Sikder and *Sukanta De*; ***Journal of Alloys and Compounds*** *820 (2020) 153115.*

8. "Cytogenotoxic potential of a hazardousmaterial, polystyrene microparticles on Allium cepa L". Sukhendu Maity, Ankit Chatterjee, Rajkumar Guchhait, *Sukanta De*, KousikPramanicka; **Journal of Hazardous Materials** 385 (2020) 121560.

9. "Mixed solvent exfoliated transition metal oxides nanosheets based flexible solid state supercapacitor devices endowed with high energy density". Shibsankar Dutta, Shreyasi Pal and *Sukanta De*; **New J. Chem.** 43 (2019) 12385-12395.

10. "Engineering of ZnO/rGO nanocomposite photocatalyst towards rapid degradation of toxic dyes". Sujoy Kumar Mandal, Kajari Dutta, Saptarshi Pal, Sumit Mandal, Avigyan Naskar, Pabitra Kumar Pal, T.S. Bhattacharya, Achintya Singha, Rezaul Saikh, *Sukanta De*, Debnarayan Jana; *Mater. Chem. Phys.* 223 (2019) 456-465.

11. "Magnetic field induced electrochemical performance enhancement in reduced graphene oxide anchored Fe3O4 nanoparticle hybrid based supercapacitor". Shreyasi Pal,Sumit Majumder, Shibsankar Dutta, Sangam Banerjee,Biswarup Satpati, and *Sukanta De*, ***J. Phys. D: Appl. Phys***. 51(2018) 375501.

12. "Development of an effective electrochemical platform for highly sensitive DNA detection using MoS2 - polyaniline nanocomposites". Shibsankar Dutta, Ankan Dutta Chowdhury, Sangita Biswas, Enoch Y. Park, Nidhi Agnihotri, Amitabha De, *Sukanta De*; ***Biochemical Engineering Journal*** 140 (2018) 130–139

13. "Efficient Flexible White-Light Photodetectors Based On BiFeO3 Nanoparticles". Suchanda Mondal, Kajari Dutta, Shibsankar Dutta, Debnarayan Jana, Adam Kelly, *Sukanta De;* ***ACS Appl. Nano Mater.,*** *1* (2018), 625.

14. "Hydrothermally Synthesized $BiVO_4$ –Reduced Graphene Oxide Nanocomposite as a High Performance Supercapacitor Electrode with Excellent Cycle Stability." Shibsankar Dutta, Shreyasi Pal and *Sukanta De*; ***New J. Chem.*** 42 (2018) 10161.

15. "Highly efficient photocatalytic activity of CuO quantum dot decorated rGO nanocomposites" Shibsankar Dutta, Kajari Das, Kaushik Chakrabarti, D. Jana, S. K. De and Sukanta De; ***J Phys. D: Appl. Phys.*** 49 (2016) 315107.

16. "Thermoelectric behaviour of organic thin film nanocomposites", G. P. Moriarty, *S De*, P. J King, U Khan, M Via, J.A. King, J. N. Coleman and J. C. Grunlan; **J. Poly. Sc. Part B: Poly. Phys.** 51 (2013) 119-123.

17. "The dependence of the optoelectrical properties of silver nanowire networks on nanowire length and diameter." Sophie Sorel, Philip E. Lyons, *Sukanta De*, Janet C Dickerson and J N Coleman; **Nanotechnology** 23 (2012) 185201.

18. "Percolation Effects in Supercapacitors with Thin, Transparent Carbon Nanotube Electrodes", Paul J King, Thomas M Higgins, *Sukanta De*, Norbert Nicoloso and Jonathan N Coleman; **ACS Nano** 6 (2012) 1732 - 1741**.**

19. "High Performance Transparent Conductors from Networks of Gold Nanowires", Philip E Lyons, *Sukanta De*, Jamil Elias, Matthias Schamel, Laetitia Philippe, Allen T Bellew, John J. Boland and Jonathan N. Coleman; **J. Phys. Chem. Lett.** 2 (2011) 3058 – 3062.

20. "The effects of percolation in nanostructured transparent conductors", *Sukanta De* and J N Coleman, **MRS Bulletin** 36 (2011) 774. *Invited review article***.**

21. "Large-Scale Exfoliation of Inorganic Layered Compounds in Aqueous Surfactant Solutions", Ronan J Smith, Paul J King, Mustafa Lotya, Christian Wirtz, Umar Khan, *Sukanta De*, Arlene O'Neill, Georg S Duesberg, Jaime C Grunlan, Gregory Moriarty, Jun Chen, Jiazhao Wang, Andrew Minett, Valeria Nicolosi, and Jonathan N Coleman; **Adv. Mater**. 23 (2011) 3944 - 3948.

22. "Transparent Conducting films from $NbSe_3$ Nanowires" , *Sukanta De*, C S Boland, Paul J King, M Lotya, U Patel, Z L Xiao and J N Coleman; **Nanotechnology** 22 (2011) 285202.

23. "Two-dimensional nano-sheets produced by liquid exfoliation of layered materials" Jonathan N Coleman, Mustafa Lotya, Arlene O'Neill, Shane D Bergin, Paul J King, Umar Khan, Karen Young, Alexandre Gaucher, *Sukanta De*, Ronan J Smith, Igor V Shvets, Sunil K Arora, George Stanton, Hye-Young Kim, Kangho Lee, Gyu Tae Kim, Georg S Duesberg, Toby Hallam, John J Boland, Jing Jing Wang, John F Donegan, Jaime C Grunlan, Gregory Moriarty, Aleksey Shmeliov, Rebecca J Nicholls, James M Perkins, Eleanor M. Grieveson, Koenraad Theuwissen, David W. McComb, Peter D. Nellist and Valeria Nicolosi; ***Science*** 331 (2011) 568 - 571**.**

24. "Size effects and the problem with percolation in nano-structured transparent conductors", *Sukanta De*, Paul J King, Umar Khan and Jonathan N Coleman; ***ACS Nano*** 4 (2010) 7064 – 7072.
25. "Improvement of Transparent Conducting Nanotube films by additions of small quantities of Graphene", Paul J King, Umar Khan, Mustafa Lotya, *Sukanta De*, and Jonathan N Coleman; ***ACS Nano*** 4 (2010) 4238 – 4246.

26. "High-Concentration, Surfactant Stabilized Graphene Dispersions", Mustafa Lotya, Paul J King, Umar Khan, *Sukanta De*, and Jonathan N Coleman; ***ACS Nano*** 4 (2010) 3155 – 3162.

27. "Are There Fundamental Limitations on the Sheet Resistance and Transmittance of Thin Graphene Films?", *Sukanta De*, and Jonathan N Coleman; ***ACS Nano*** 4 (2010) 2713 – 2720.

28. "High concentration solvent-exfoliation of defect-free graphene", Umar Khan, Arlene O'Neill, Mustafa Lotya, *Sukanta De*, and Jonathan N Coleman; ***Small*** 6 (2010) 864-871.

29. "Flexible, transparent, conducting films of randomly stacked graphene from surfactant-stabilised, oxide - free graphene dispersions", *Sukanta De*, Paul King, Mustafa Lotya, Arlene O'Neill, Evelyn M Doherty, Yenny Hernandez, Georg S Duesberg and Jonathan N Coleman; ***Small*** 6 (2010) 458-464.

30. "Connectivity in single walled carbon nanotube networks", Peter N. Nirmalraj, Philip E Lyons, *Sukanta De*, Jonathan N Coleman, John J Boland; ***Nano Letters*** 9 (2009) 3890 – 3895.

31. "Silver nanowire networks as flexible, transparent, conducting films: Extremely high DC to optical conductivity ratios", *Sukanta De*, Thomas M Higgins, Philip E Lyons, Evelyn M Doherty, Peter N. Nirmalraj, Werner J Blau, John J Boland and Jonathan N Coleman; ***ACS Nano*** 3 (2009) 1767-1774**.**

32. "The spatial uniformity and electromechanical stability of transparent, conductive films of single walled nanotubes", Evelyn M. Doherty**,** *Sukanta De***,** Philip E. Lyons, Aleksey Shmelov, Peter N. Nirmalraj, Vittorio Scardaci, Jerome Joimel, Werner J. Blau, John J. Boland and Jonathan N. Coleman; ***Carbon*** 47 (**2009**) 2466-2473**.**

33. **"**Development of transparent, conducting composites by surface infiltration of nanotubes into commercial polymer films", Ian O'Connor**,** *Sukanta De***,** Jonathan N. Coleman and Yurii K. Gun'ko; ***Carbon 47*** (2009) 1983-1988.

34. "Liquid Phase Production of Graphene by Exfoliation of Graphite in Surfactant/Water Solutions", Mustafa Lotya, Yenny Hernandez, Paul J. King, Ronan J. Smith, Valeria Nicolosi, Lisa S. Karlsson, Fiona M. Blighe, *Sukanta De*, Zhiming Wang, I. T. McGovern, Georg S. Duesberg and Jonathan N. Coleman; ***J. Am. Chem. Soc.*** 131 (2009) 3611–3620

35. "Transparent, Flexible, and Highly Conductive Thin Films Based on Polymer−Nanotube Composites", *Sukanta De*, Philip E. Lyons, Sophie Sorel, Evelyn M. Doherty, Paul J. King, Werner J. Blau, Peter N. Nirmalraj, John J. Boland, Vittorio Scardaci, Jerome Joimel and Jonathan N. Coleman; ***ACS Nano*** 3 (2009) 714-720

36. "High-yield production of graphene by liquid-phase exfoliation of graphite", Yenny Hernandez, Valeria Nicolosi, Mustafa Lotya, Fiona M. Blighe, Zhenyu Sun, *Sukanta De*, I. T. McGovern, Brendan Holland, Michele Byrne, Yurii K. Gun'Ko, John J. Boland, Peter Niraj, Georg Duesberg, Satheesh Krishnamurthy, Robbie Goodhue, John Hutchison, Vittorio Scardaci, Andrea C. Ferrari, Jonathan N. Coleman, ***Nature Nanotechnology*** 3 (2008) 563.

37. "On the factors controlling the mechanical properties of nanotube films", Fiona M Blighe, Philip E Lyons, *Sukanta De*, Werner J Blau, Jonathan N Coleman; ***Carbon,*** **46** (2008**) 41-47.**

38. "The relationship between network morphology and conductivity in nanotube films", Philip E. Lyons, *Sukanta De*, Fiona Blighe, Valeria Nicolosi, Luiz Felipe C. Pereira, Mauro S. Ferreira, and Jonathan N. Coleman; ***J. Appl. Phys.*** 104 (2008) 044302.

39. "Electrical transport and optical properties of vanadyl phosphate—polyaniline nanocomposites" *Sukanta De*, Arup Dey and S.K. De; ***J. Phys. Chem. Solids*** 68 (2007) 66-72.

40. "Optical and electrical characterizations of self-assembled CdS nanorods— polyaniline composites", Kousik Dutta, *Sukanta De* and S. K. De; ***J. Appl. Phys.*** 101 (2007) 093711.

41. "Characterization and electrical properties of vanadyl phosphate-polypyrrole nanocomposites", *Sukanta De*, Arup Dey and S.K. De; ***J. Phys. D: Appl. Phys.*** 39 (2006) 500-505.

42. "Giant dielectric constant in titania nanoparticles embedded in conducting polymer matrix", Ashis Dey, *Sukanta De*, A. De And S. K. De; ***Journal of Nanoscience and Nanotechnology*** 6 (2006) 1427-1436.

43. "Characterization and transport properties of intercalated polypyrrole-vanadium pentoxide xerogel nanocomposite", *Sukanta De*, Ashis Dey and S.K. De; ***Solid State Communications*** 137 (2006) 662-667.

44. "Large polaron tunneling and anomalous dielectric response in complex layered systems", *Sukanta De*, Arup Dey and S.K. De; ***J. Appl. Phys.*** 100 (2006) 024105.

45. "Proton and electron conduction in polymer intercalated vanadium pentoxide xerogel", *Sukanta De*, Ashis Dey and S.K. De; ***Solid State Ionics*** 177 (2006) 245-252.

46. "Mixed protonic-electronic conduction and dielectric response in layered vanadyl phosphate nanocomposites", *Sukanta De*, Arup Dey and S.K. De; ***J. Chem. Phys.*** 125 (2006) 224704.

47. "Humidity effect on electrical properties of layered α-zirconium phosphate", *Sukanta De*, and S.K. De; ***Solid State Communications*** 134 (2005) 553-557.

48. "Charge transport mechanism of vanadium pentoxide xerogel-polyaniline nanocomposite", *Sukanta De*, Ashis Dey and S.K. De; ***European Physical Journal B*** 46 (2005) 355-361.

49. "Transport and dielectric properties of α-zirconium phosphate-polyaniline composite", *Sukanta De*, A. De, Ajay Das, and S.K. De; ***Mater. Chem. Phys.*** 91 (2005) 477-483.

50. "Characterization and dielectric properties of polyaniline-TiO2 nanocomposites", Ashis Dey, *Sukanta De*, A. De And S. K. De; ***Nanotechnology*** 15 (2004) 1277- 1283.

B. *Conference Proceedings:*

1. "A facile hydrothermal approach to synthesize rGO/BiVO4 photocatalysts for visible light induced degradation of RhB dye". *Shreyasi Pal, Shibsankar Dutta and Sukanta De*; **AIP Conference Proceedings** 1953, 030205 (2018). ISSN: 48438

2. "Few-layered MnO2/SWCNT hybrid in-plane supercapacitor with high energy density". *Shibsankar Dutta, Shreyashi Pal and Sukanta De;* **AIP Conference Proceedings** 1953, 030145 (2018). ISSN: 48438

3. "One-dimensional α-MoO3 nanorods for high energy density pseudocapacitor." *Shibsankar Dutta, Shreyashi Pal and Sukanta De;* **AIP Conference Proceedings** 1942, 140086 (2018). ISSN: 48438

4. "Synthesis of MoS2/rGO nanosheets hybrid materials for enhanced visible light assisted photocatalytic activity." *Shreyasi Pal, Shibsankar Dutta and Sukanta De*; **AIP Conference Proceedings** 1942, 050129 (2018). ISSN: 48438

5. "MoS2 Nanosheet/rGO Hybrid: An Electrode Material for High Performance Thin Film Supercapacitor", *Shibsankar Dutta and Sukanta De,* **Materials Today: Proceedings** 5(2018) 9771-9775.

6. "Few layered MoO3 nano sheets-SWCNT composite thin film as supercapacitor electrode," *Shibsankar Dutta, Jasim Akther and Sukanta De,* **AIP Conference Proceedings** 1832, 050113 (2017). ISSN: 48438

7. "Synthesis of rGO@ZnS nanocomposites for visible light assisted high photocatalytic performance." *S Dutta, Shreyasi Pal, Subrata Mondal and Sukanta De;* ***Invertis J. Renew. Energy*** *7 (2017)64-69.* ISSN: 2231-3419

8. "Few layered vanadyl phosphate nano sheets-MWCNT hybrid as an electrode material for supercapacitor Application", *Shibsankar Dutta and Sukanta De*. **AIP Conference Proceedings** 1728, 020479 (2016). ISSN: 48438

9. "High performance Supercapacitor based on vanadyl phosphate and Graphene composite" , Shibsankar Dutta, Hasim Ali, Montu Modak, Sukanta De , Proceedings of UGC sponsored National Level Seminar On Recent Advances in Materials Science (ISBN: 978-81-928110-9-3), Department of Industrial Chemistry Ramakirshna Mission Vidyamandir Belur Math, Howrah, 2016, Page 150-154. ISBN: 978-81-928110-9-3

Other Professional Activities

Supervision:

Project Student: 21 (UG and PG)

Editorial Board:

Review Editor on the Editorial Board of Interdisciplinary Physics, Frontier in Physics.

Reviewer:

I have reviewed manuscript from high impact journals like, Journal of Materials Chemistry, Chemistry of Materials, ACS Nano, Chemical Communications, Applied Physics Letters, Applied Physics A, ACS Applied Materials & Interfaces.

Industrial experience:

Almost six years I have worked in industrial project collaboration with Hewlett Packard. In this project my role was to conduct research, supervise PhD and project students and also planning the future work to meet the industry needs and report to PI as well as to HP.