CURRICULUM VITAE

Dr. Sourav Kanti Jana (PhD)
Senior Project Officer
DST Unit of Nanoscience and Thematic Unit of Excellence,
Pradeep Research Group, Department of Chemistry,
Indian Institute of Technology Madras,
Chennai -600036,
Tamil Nadu, India
Email: skj_ec@yahoo.co.in
Mobile: +91-8250218245 / 7501272685
Web: www.souravjana.com

Researcher identifiers:

Personal Details

Date of Birth:	16^{th} April, 1981
Sex:	Male
Nationality:	Indian
Marital Status:	Married (having one girl child of 9 years age)
Present address:	DST Unit of Nanoscience and Thematic Unit of Excellence, Pradeep Research Group, HSB 148, Department of Chemistry, IIT Madras, Chennai-600036, Tamil Nadu, India
Permanent address:	Sikha Bhawan, C/O Lt. Tushar Kanti Jana Vill. Henria (Atmaramchak), Post: Henria, Khejuri Dist. Purba Medinipore, Pin: 721430, West Bengal, India

Academic qualifications

- **Ph. D (2012), Materials Science, University of Milano Bicocca, Italy**
  Thesis title: “Light harvesting methods in photovoltaic devices with some superficial treatments”

- **Master of Technology (2008), Material Engineering, Jadavpur University, India**
  Thesis title: “Studies on Electrochemical Deposition and Surface Modification of Nanocrystalline – Nanoporous ZnO Thin films for Gas Sensor Applications”.

- **Master of Science (2003), Electronic Science, Jadavpur University, India**
  Thesis title: “Simulation Studies of Log amplifier based Lineariser of Thermocouples”

- **Bachelor of Science (2001), Electronics, Vidyasagar University, India**

- **Graduate Aptitude Test in Engineering (GATE)’ 2005, Electronics and Communication Engineering, India**

Professional Training & Courses

- **Microsoft Power BI Certified (2023)** from **Skill Nation, India**
- **Advanced Microsoft Excel, SQL, Tableau** (perusing)
- ***"Power Electronics Devices and Applications",*** **Advanced Training Institute for Electronics and Process Instrumentation, Ministry of Labour, Directorate General of Employment & Training, Govt. of India**, Ramanthapur, Hyderabad -500013

  Duration: Two Weeks

Professional Skills

(i) Business Intelligence

- **Data Visualization**: By using Power BI, I can develop, from simple bar charts and pie charts to more complex visualizations like tree maps, heat maps, and custom visuals of any data set.
- **Interactive Reports:** I can create interactive reports with drill-through and drill-down capabilities. This lets viewers explore data at varying levels of granularity.
- **Dashboard Creation**: I can create a summarized view of your most important metrics and data on a single dashboard. These dashboards are interactive and can be shared with others.
- **Data Transformation and Cleansing**: Using Power Query, I can connect to data, transform it, and prepare it for analysis. This includes operations like filtering, sorting, and creating calculated columns.
- **Publishing and Sharing**: I can share the dashboard with others, both within and outside the organization, using Power BI Service.
- **Q&A Feature**: I can make the dashboard interactive so that users can ask natural language questions and get answers in the form of visuals or reports, making data exploration even easier.

(ii) Scientific Research

- Carried out several scientific projects in Material Science and Nanotechnology.
- Experienced in making nanomaterials using various methods.
- Experienced in UV-Vis, Reflection spectroscopy, Photoluminescence spectroscopy, and NT MDT atomic force microscopy.
- Proficient in various photovoltaic characterization methods, including Themo Oriel Solar simulator, spectral response, and EQE measurement systems.
- Nanomaterial-based device design and fabrication.
- Over 11 years of experience in modern electrochemistry and electrochemical technology.
- Scientific data analysis and data representation in Origin and Microsoft Excel.
- Scientific paper and patent filing.
- PowerPoint presentation in front of the research community and industrial professionals.
- Coordinated two international webinars on Interdisciplinary science (iC^2IS- 2022 and 2023).

(iii) Product development

- Experienced with development of water sensor technology and desalination technology. I made tiny sensors that detect harmful metals like arsenic, chromium, and manganese in the environment.
- Product design and development.
- I built an Android potentiostat for electrochemistry and sensors.
- Hands-on experience on Arduino microcontroller, and Arduino IDE coding.

Research Experiences

Sl. No.	Duration	Designation, Organization and Project Title
1	7th January'2015 – 13th December'2016	**Senior Project Officer** DST Unit of Nanoscience and Thematic Unit of Excellence, Department of Chemistry, IIT Madras, India **Projects**: (i) "*Development of Portable Electrochemical Arsenic Sensor for Community-Scale*" (ii) "*Development of smart phone controlled low-cost potentiostat for electrochemical applications"*
2	7th January 2015 – 13th December 2016	**Research Scientist (Senior Post Doctoral Fellow),** Chemical Science Division, Indian Institute of Science Education & Research (IISER), Kolkata, India **Project Title**: *"Development of electrochemical energy generation and storage device using chalcogenide 2d materials"*
3	May 2012 – 6th January 2015	**Post Doctoral Fellow,** Surface Physics and Material Science Division, Saha Institute of Nuclear Physics, Kolkata, India. **Project Title**: *"Study the Physical and Electrochemical Property of Nanostructured Materials"*

Professional Experiences as a Co-supervisor in Scientific Research

Duration	Role as Co-supervisor
15th May'2023 – 15th July'2023	**Co**-supervised and trained BS-MS student of IISER Pune at Pradeep Research Group **Project title**: *Electro crystallization of metal nanocluster*
1st June 2022 – 28th July'2022	**Co-**supervised and trained BS-MS student of IISER TVM at Pradeep Research Group **Project title**: *Toxic metal ions sensing using a homemade handheld potentiostat*

14th December'2016 - till date	Supervised research projects of several Ph.D. students of Pradeep Research Group. **Project Title**: (i) *"Highly-sensitive* As^{3+} *detection using electrodeposited nanostructured MnOx and phase evolution of the active material during sensing"* (ii) *"Generation of alternative energy using 2D* MoS_2*"* (iii) *"Capacitive deionization techniques for water desalination"* (iv) *"Development of chemical and humidity sensors"* (v) *"Application of metal nanoclusters"*
April 2012 - May 2012	**Assistant guide** of summer M. Sc project students (IIT Bombay), Surface Physics Division, Saha Institute of Nuclear Physics, Kolkata. **Title of the project**: "*Wet chemical synthesis of doped nanocrystals*".
September 2012 – July 2013	**Assistant guide** of an M.Tech project student of **NIT Agartala**, India. Surface Physics Division, Saha Institute of Nuclear Physics, Kolkata **Title of the project:** "*Study of Gold nanoparticles sensitized* TiO_2 *based photoelectrochemical cell"*
September 2012 – July 2013	**Assistant guide** of an M.Tech project student of **NIT Durgapur**, India. Surface Physics Division, Saha Institute of Nuclear Physics, Kolkata **Title of the project:** "*Optical and magnetic property of core-shell nanoparticle"*
August 2012 – September 2013	**Demonstrator of Post M.Sc. (first year Ph. D.) students' laboratory** **Project title:** *Contact angle measurement of surface modified Si surface*
June 2014 - August 2014	**Assistant guide** of a summer project student, Surface Physics Division, Saha Institute of Nuclear Physics, Kolkata. **Title of the project**: "*Synthesis and microscopical study of order porous polymer film*".

Research Projects Handled

(1) Present position: <u>Senior Project Officer</u>

Organization: DST Unit of Nanoscience and Thematic Unit of Excellence, Pradeep Research group, Department of Chemistry, IIT Madras, Chennai, Tamil Nadu, India

Project Title: (i) "*Development of Portable Electrochemical Arsenic Sensor for Community Scale*"
(ii) **"***Development of smart phone controlled low-cost potentiostat for electrochemical applications"*

Brief description of the project: (i) Current process for measuring arsenic (***As***) contamination in drinking water in the field is only semi-quantitative and time-consuming because there is no handheld device. Moreover, research has progressed on ***As*** sensor-based anodic stripping voltammetry (ASV) which is not specific. Sensitivity and interference are issues in developing an effective arsenic sensor. Therefore, there is a need for an improved measuring system such as a specific amperometric device like a commercially available glucose monitor that is rapid, affordable, accurate, and easy to use. In addition, the operating voltage for the stripping-based sensor is high. Hence, developing an amperometric sensor with high selectivity in field water samples at a low operating voltage is the key innovation. Ideally, it has to be connected to a smartphone. In this project, we have developed an electrochemical sensor based on reduced graphene oxide for highly selective arsenic detection with a Limit of Detection (LOD) (≤ 10 ppb). We have demonstrated the electrochemical detection of ***As*** in real-field water. Also, we immobilized arsenite oxidase on a graphene electrode in order to understand direct electron transfer (DET) in view of selective arsenic sensing. At present, we are working on the development of a prototype using this optimized rGO electrode.
Duration: 14th December 2016 to December 2020

(ii) In this project, I have been working to develop a pocket-size potentiostat (PSTAT) for several electrochemical applications. This potentiostat will be operated through a mobile application via Bluetooth connection. Basic electrochemical measurements like cyclic voltammetry (CV), chronoamperometry (CA), and linear sweep voltammetry (LSV) can be performed. This PSTAT will be energized through mobile power. We have achieved the current resolution of the PSTAT to several microamperes. Presently, I am involved in modifying the electronic circuit to get a current resolution in the range of nanoampere.

Duration: 1st January 2021 to the date of application

<u>Post-doctoral experiences</u>

(2) Research Scientist (Senior Post Doctoral Fellow)

- **Organization**: Chemical Science Division, Indian Institute of Science Education & Research (IISER), Kolkata, India

Project Title: *"Development of electrochemical energy generation and storage using chalcogenide 2d and graphene materials"*

Brief description of the project: Main objectives of this project were:

- To develop the synthetic methods to prepare MoS_2 with large interlayer spacing and evaluate their electrochemical charge storage application.
- Formation of graphene and graphene oxide junctions and their interfacial electrochemical property by electrochemical impedance spectroscopy (EIS) technique.
- Fabrication and characterization of the supercapacitor device using this thin film material.
- In addition, we have studied TiO2-based electrocatalysts for the electrochemical reduction of CO_2 in ambient conditions.

Duration: 7th January' 2015 – 13th December' 2016

(3) Post-Doctoral Fellow

- **Organization**: Surface Physics and Material Science Division, Saha Institute of Nuclear Physics (SINP), Kolkata, India.

- **Project Title**: *"Study the Physical and Electrochemical Properties of Nanostructured Materials"*

Brief description of the project: Main objectives of this project were:

- Design and fabrication of metal nanocluster incorporated in oxide nanostructure by means of cyclic voltammetry and study their supercapacitor application.

- Improvement of photo-electrochemical water splitting efficiency by surface modification of TiO_2 -based nanostructure material.

- Moreover, we have studied the optical property of surface-modified oxide nanostructures,

Duration: 2nd May' 2012 – 6th January'2015

(A) Ph. D thesis title: "*Light harvesting methods in photovoltaic devices with some superficial treatments*"

Photovoltaics (PV) are fast emerging as an attractive renewable energy technology due to concerns of global warming, pollution and scarcity of fossil fuels supplies. However to compete in, the global energy market, solar cells need to be cheaper and more energy efficient. Silicon is the favorite semiconductor used in solar photovoltaic cells because it is abandoned in nature, and this technology is a well-established technology and nontoxic. According to the Shockley-Queisser model, the theoretical efficiency limit for a single junction solar cell with an optimal absorber band gap of 1.1 eV is 31%. A large portion of the 69% energy loss can be ascribed to thermalization-related losses. Thermalization occurs when the solar converter absorbs photons with energy much higher than the energy gap: in this case, the generated charge carriers relax in the short time it takes them to reach the edge of the conduction and valence bands, respectively, and the remaining energy is turned into heat in the device. The incident solar spectrum can be modified to exploit the high-energy region better, and this is expected to increase the efficiency of single junction cells. A possible approach to modifying the high energy side of the solar spectrum is down-shifting. In this process, one low-energy photon is created by one high-energy photon absorbed into a proper molecular system emitting around the maximum quantum efficiency value of the photovoltaic (PV) device. So far the cost of wafer-based silicon PV is high. Also $Cu(In,Ga)Se_2$ thin film cells play an important role in low-cost PV, but the efficiency of the cost-reduced cells is lower compared to wafer-based cells. So light trapping into photovoltaic cells is a great issue in order to increase the carrier generation inside the active layer of both bulk as well as thin film cells without disturbing their fabrication technology. There are many light harvesting methods; among them, Surface Plasmon method using metal nanoparticles and the spectrum downshifting method using nanocrystals are discussed here.

(i) Study the surface Plasmon scattering effect on wafer based Si as well as $Cu(In,Ga)Se_2$ thin film solar cell using metal nanoparticles (silver and gold)prepared by colloidal synthesis.

Metal nanoparticles (NPs) support surface plasmon when light is incident on them, which causes the scattered light into the underlying substrate. This process is realized on standard silicon solar cells. The feasible photocurrent enhancement due to light scattering by NPs was examined using spectral response and I-V measurements. Relative increases in the total delivered power under simulated solar irradiation were observed for cells both with and without antireflection coating using both silver and gold nanoparticles. The relative enhancement of External Quantum Efficiency (EQE) derived from the spectral response measurements was observed for both the silicon cells. The better results obtained from both spectral response and I-V measurements were recognized in the case of cells without antireflection coating. The results from I-V measurements under Air Mass 1.5 irradiation on the cells (without antireflection coating) correspond to a clear increase of the short circuit current due to both silver (relative increase of 7.5%) and gold (relative increase of 6.1%) nanoparticles. Also, a relative enhancement (1.5%) of short circuit current was ascribed in the cells (with antireflection coating). A possible enhancement of external quantum efficiency in the red wavelength region where these cells already have a poor spectral response was achieved by deploying this method on $Cu(In,Ga)Se_2$ based thin film solar cells.

(ii) Study the spectral down-shifting method on Si solar cells using Mn doped ZnS quantum dots synthesized using wet chemical synthesis.

UV response (below 400 nm) of Si solar cells can be improved by spectral down shifting method using luminescent Mn doped ZnS nanocrystals. Downshifting of photons on the Si solar cell is realized by the absorption and emission property of the doped nanocrystals. Both band gap and emission intensity of ZnS can be tuned by doping concentration of Mn. Different photoluminescence emission intensity is ascribed due to changes in crystal field strength with different doping concentrations of ZnS nanocrystals. Also, shift of the maximum intense emission wavelength of different samples is observed. The design of efficient down-shifters suitable for different PV devices requires the correct choice of the luminescent species (luminescence wavelength and intensity) in order to fit the optical features of both Si and CuInGaSe thin-film solar cells. We reported first time the downshifting property of doped ZnS nanocrystals on PV cells to enhance their performance. Relative enhancement of EQE has been attributed to the UV region due to a lower concentration of nanocrystals. An enhancement of EQE for both monocrystalline silicon $Cu(In,Ga)Se_2$ solar cells is 6%, and 17% observed respectively. So the down-shifting action of ZnS:Mn nanocrystals was proven, showing that this approach would be promising to improve the performance of single junction PV devices.

(B) Project (Master of Technology): "***Studies on Electrochemical Deposition and Surface Modification of Nanocrystalline – Nanoporous ZnO Thin films for Gas Sensor Applications"***

The functional characteristics of the Planar and MIM (metal-insulator-metal) sensors using electrochemically grown nanocrystalline-nanoporous ZnO thin films and surface modified by dipping in an aqueous solution of $PdCl_2$ were investigated for methane as well as hydrogen sensing. It was found that the operating temperature was substantially reduced to 70ºC and 100ºC respectively for the two different configurations for methane and to 50ºC for hydrogen. A high-purity Zn was anodized to produce ZnO thin films using Zn foil as an anode, a Pt cathode, a calomel as a reference electrode and 0.3M oxalic acid electrolyte. Pd-Ag (26%) was used as the catalytic metal contact to ZnO to fabricate a planar and a MIM configuration. The sensors were studied in presence of 1% methane in nitrogen and in synthetic air in separate experiments. In the case of methane sensing the response of the order of ~ 48, a response time of ~ 4.5 s and a recovery time of ~ 22.7 s were obtained for the planar structures while the MIM structures showed a response of the order of ~ 32, a response time ~2.7 s and a recovery time of ~ 16 s. In the case of hydrogen sensing, a response of the order of ~ 65, a response time of ~ 2.2 s and a recovery time of ~ 21.8 s were obtained for planar structures while the MIM structures showed a response of the order of ~ 62, a response time ~1.8 s and a recovery time of ~ 14 s. Both the sensors were stable respectively in presence of 1% methane as well as in 1% hydrogen in nitrogen and synthetic air as carrier gases.

(C) ***Project (Master of Science): "Simulation Studies of Log amplifier based Lineariser of Thermocouples"***

This work was based on a new analog linearization circuit for thermocouple temperature sensors. The proposed circuit employs the linearizing action inherent in logarithmic operation, as well as the ratiometric property of op-amp based logarithmic amplifier compensated against variation in ambient temperature. Numerical and PSPICE simulation studies were carried out using the standard data for T, J and G type thermocouples.

Research Interest

(a) Fabrication of nanostructured thin film electrodes by physical and chemical methods for potential applications

- (i) Fabrication of low cost and highly efficient electrodes for capacitive desalination technology
- (ii) Development of electrochemical sensors for water contaminants
- (iii) Development of thin film and nanostructure-based chemical sensors for food quality monitoring

(b) Development of capacitive deionization technology using low-cost electrodes

- (i) Synthesis of low-cost electrode materials at an affordable cost
- (ii) Development of a PV-driven water kiosk with CDI

(c) Understanding the surface and interfacial property through impedance spectroscopy

(d) Development of energy storage devices (supercapacitor, Li-ion battery)

- (i) Synthesis of different composite materials based on metal oxides, graphene, carbon nanotube, chalcogenide materials, and Mxene for supercapacitor and battery applications.

Aim:

- Enhance the charge storage capacity
- Reduce the internal resistance to enhance the power delivery capacity
- Reduce the contact resistance between the current collector and active material
- Use conductive binders to enhance the life cycle of the active electrode material

(d) Fabrication of solar cell devices and development of light harvesting methods of existing solar cells

- (i) Study of the highly luminescent nanocrystals, dye, and rare earth organic complexes for spectral conversion in order to improve better performance of standard Si solar cells.
- (ii) Solar energy materials and thin film solar cells based on CIGS or CIS materials.
- (iii) Electrochemical synthesis, characterization, and applications of low band gap semiconductors for photoelectrochemical device applications.

Expertise on Experimental Techniques

- Thermal evaporation technique
- RF sputtering unit.
- Spin coater

- Electrochemical setup (Princeton Applied Research, CHI 660, Biologic, Palmsense)
- Impedance spectroscopy
- Conventional annealing setup.
- Handling capabilities with different polymer & co-polymer (like: PMMA, PDDA, PVA & EVA) for thin film preparation
- Spectral response system
- Thermo oriel solar simulator
- Ultra-violet/Visible Spectroscopy (UV/Vis).
- Photoluminescence setup
- Atomic force microscope (NT-MDT)
- Contact angle measurement
- Raman spectroscopy

Talk Delivered

- Final project talk of M. Tech at Jadavpur University, India in 2008
- Renewal talk of Ph.D. at University of Milano-Bicocca, Milano, Italy in 2009
- Renewal talk of Ph.D. at University of Milano-Bicocca, Milano, Italy in 2010
- Final year talk of Ph.D. at University of Milano-Bicocca, Milano, Italy in 2011
- Post-Doctoral talk at Saha Institute of Nuclear Physics, Kolkata, India in 2012
- Invited talk at Indian Institute of Science Education and Research Kolkata, India 2014
- Invited talk at DST Unit of Nanoscience and Thematic Unit of Excellence, Department of Chemistry, IIT Madras, Chennai, India, November'2016
- Invited talk presented in ICMST conference held in St. Thomas College, Pala, Kottyam, June' 2016 , "Intercalated MoS_2 for AC line filtering application"

Publications in Journals

Journal papers

Total citations**: 540,** h-index**: 14,** i10-index**: 20**
(https://scholar.google.co.in/citations?user=VDynLc8AAAAJ&hl=en)

1) *"Vertically Aligned Nanoplates of Atomically Precise Co_6S_8 Cluster for Practical Arsenic Sensing",* A. Jose, A. Jana, T. Gupte, A. S. Nair, K. Unni, A. Nagar, A. R. Kini, B. K. Spoorthi, **S. K. Jana**, B. Pathak, and T. Pradeep, **ACS Materials Lett**. 2023, 5, 3, 893–899.

2) *"Toward Continuous Breath Monitoring on a Mobile Phone Using a Frugal Conducting Cloth-Based Smart Mask",* P. Srikrishnarka, R. M. Dasi, **S. K. Jana**, T. Ahuja, J. S. Kumar, A. Nagar, A. R. Kini, B. George, and T. Pradeep, **ACS Omega ,** 2022, 7, 47, 42926–42938.

3) *"Ion-Exchanging Graphenic Nanochannels for Macroscopic Osmotic Energy Harvesting",* A. Nagar, Md R. Islam, K. Joshua, T. Gupte,; **S. K. Jana**, S. Manna, T. Thomas, T. Pradeep, **ACS Sustainable Chemistry and Engineering,** 2022, 10, 46, 15082–15093.

4) *"A Selective and Practical Graphene-based Arsenite Sensor at 10 ppb"*, **S. K Jana**, K. Chaudhari, Md R. Islam, G. Natarajan, T. Ahuja, A. Som, G. Paramasivam, A Raghavendra, C. Sudhakar, T. Pradeep, A**CS Appl. Nano Mater.** 2022, 5, 8, 11876–11888

5) "Industrial Utilization of Capacitive Deionization Technology for the Removal of Fluoride and Toxic Metal Ions ($As^{3+}/^{5+}$ and Pb^{2+}*)",* Md. R. Islam, S. S. Gupta, **S. K. Jana,** T. Pradeep, **Global Challenges**, 2022, 6, 2100129.

6) *"2D-Molybdenum Disulfide-Derived Ion Source for Mass Spectrometry"* P. Basuri, **S. K. Jana**, B. Mondal, T. Ahuja, K. Unni, Md R. Islam, S. Das, J. Chakrabarti, T. Pradeep**, ACS Nano,** 2021, 15, 5023–5031. *This article is appeared in* ***C &En*** *News,* *https://cen.acs.org/analytical-chemistry/mass-spectrometry/Ionization-source-mass-spectrometry-needs/99/i7*

7) *"A covalently integrated reduced graphene oxide-ion exchange resin electrode for efficient capacitive deionization*", Md R. Islam, S. Sen Gupta, **S. K. Jana**, P. Srikrishnarka, B. Mondal, S. Chennu, T. Ahuja, A. Chakraborty, T. Pradeep*, **Advanced Materials Interfaces,** 2021, 8, 2001998.

8) *"Microdroplet impact-induced spray ionization mass spectrometry (MISI MS) for online reaction monitoring and bacteria discrimination"*, P. Basuri, S. Das, S. K. Jenifer, **S. K. Jana**, Thalappil Pradeep, **Journal of the American Society for Mass Spectrometry**, 2021, 32, 355-363.

9) *"Arsenic toxicity: Carbonate's Counteraction Revealed"*, S. J. Ravindran, S. K Jenifer, J. Balasubramanyam, **S. K. Jana**, S, Krishnakumar, S. Elchuri, L. Philip, T. Pradeep, **ACS Sustainable Chemistry & Engineering**, 2020, 8, 5067-5075.

10) "*Ionic liquid intercalated metallic* MoS_2 *as a superior electrode for energy storage applications***",** H. R. Inta, T. Biswas, S. Ghosh, R. Kumar, **S. K. Jana**, V. Mahalingam, **ChemNanoMat**, 2020, 6 (4), 685-695.

11) *"Enhancing the sensitivity of point-of-use electrochemical microfluidic sensors by ion concentration polarisation – A case study on arsenic",* V. Subramanian, S. Lee, S. Jena, **S. K. Jana**, D. Ray, S. J. Kim, T. Pradeep, **Sensors and Actuators B: Chemical**, 2020**,** 304, 127340-8.

12) *"In-situ Monitoring of Electrochemical Reactions Through CNTs-assisted Paper Cell Mass Spectrometry",* R. Narayan†, P. Basuri†, **S. K. Jana**, A. Mahendranath, S. Bose, T. Pradeep, **Analyst,** 2019, 144, 5404-5412**.**

13) *"Highly-sensitive* As^{3+} *detection using electrodeposited nanostructured* MnO_x *and phase evolution of the active material during sensing",* T. Gupte†, **S. K. Jana†**, J. Mohanty, P. Srikrishnarka, S. Mukherjee, T. Ahuja, C. Sudhakar, T. Thomas, T. Pradeep, **ACS Applied Materials & Interfaces,** 2019**,** 11**,** 28154-28163.

14) *"Surface-Treated Nanofibers as High Current Yielding Breath Humidity Sensors for Wearable Electronics", S. A. Iyengar†, P. Srikrishnarka†,* **S. K. Jana**, M. R. Islam, T. Ahuja, J. S. Mohanty, and T. Pradeep, **ACS Appl. Electron. Mater.** 2019, 1, 951−960.

15) *"Electrospray deposition-induced ambient phase transition in copper sulphide nanostructures",* A. Jana**, S. K. Jana**, D. Sarkar, T. Ahuja, P. Basuri, B. Mondal, S. Bose, J. Ghosh and T. Pradeep, **Journal Materials Chemistry A**, *2019, 7 6387.* ***(This article is part of the themed collection: 2019 Journal of Materials Chemistry A HOT Papers)***

16) *"An alternative electron transfer process for selective detection of glucose in blood serum",* B. Saha, **S. K. Jana***, S. Majumder, S. Banerjee, **Sensors and Actuators B: Chemical**, ***2019,*** *283, 116-123.*

17) *"Holey MoS_2 Nanosheets with Photocatalytic Metal Rich Edges by Ambient Electrospray Deposition for Solar Water Disinfection",* D. Sarkar, B. Mondal, A. Som, Swathi J. R., **S. K. Jana,** C. K. Manju, T. Pradeep, **Global Challenges (Wiley)** ***2018***, *2, 1800052 (2-8). (This article was considered as* ***Front Cover Page*** *of the journal)*

18) *"Rectification and amplification of ionic current in graphene/graphene oxide junction: An electrochemical diode and transistor"***, S. K. Jana***, S. Banerjee, S. Bayan, H. R. Inta, and V. Mahalingam, **J. Phys. Chem. C**, **2018**, 122 (21), pp 11378–11384. Highlighted in **Nature India,** ***https://www.nature.com/articles/nindia.2018.124***

19) *"Ligand sensitized strong luminescence from Eu^{3+}-doped $LiYF_4$ nanocrystals: A photon downshifting strategy to improve the Si solar cell efficiency",* T. Samanta, **S. K. Jana,** Athma E. P, V. Mahalingam, **Dalton Transaction**, ***2017****, 46,9646-9653.*

20) *"Selective Growth of Co-electrodeposited Mn_2O_3-Au Spherical Composite Network towards Enhanced Non-enzymatic Hydrogen Peroxide Sensing",* B. Saha, **S. K. Jana***, S. Majumder, B. Satpati and S. Banerjee*, **Electrochimica Acta,** ***Vol. 174, 853-863,*** 2015.

21) *"Fluorescence resonance energy transfer and surface plasmon resonance induced enhanced photoluminescence and photoconductivity property of Au-TiO_2 metal-semiconductor nanocomposite",* S. Majumder[†], **S. K. Jana[†]***, K. Bagani, B. Satpati, S. Kumar, and S. Banerjee, **Optical Materials ,** Vol. 40 (2015) 97-101**.**

22) *"Structural and electrochemical analysis of a novel co-electrodeposited Mn_2O_3–Au nanocomposite thin film",* ***S. K. Jana****, *B. Saha, B. Satpati, S. Banerjee,* **Dalton Transactions,** *Vol.44 (2015),* 9158-9169.

23) *"Enhancement of photoluminescence emission and anomalous photoconductivity properties of Fe 3 O 4@ SiO 2 core–shell microspheres"*, **S. K Jana***, S. Majumder, S. Mishra, S. Banerjee**, RSC Advances,** Vol. *5 (2015), 37729-37736.*

24) *"Enhancement of supercapacitance property of electrochemically deposited MnO_2 thin films grown in acidic medium"* **S. K. Jana***, V. P. Rao and S. Banerjee, **Chemical Physics Letters,** Vol. 593 (2014) 160-164.

25) *"Enhanced photoelectrochemical property of gold nanoparticle sensitized TiO_2 nanotube: A crucial investigation at electrode-electrolyte interface"*, **S. K. Jana***, T. Majumder and S. Banerjee, **Journal of Electroanalytical Chemistry,** 727 (2014) 99–103.

26) *"Optimized luminescence properties of Mn doped ZnS nanoparticles for photovoltaic applications"*, A. Le. Donne[†]**, S. K. Jana**[†], S. Banerjee, S. Basu, and S. Binetti, **Journal of Applied Physics,** Vol. 113: 014903-5 (2013)

27) *"Enhancement of silicon solar cell performances due to light trapping by colloidal metal nanoparticles",* **S. K. Jana**, A. L. Donne and S. Binetti, **Journal of Physics and Chemistry of Solids,** Vol. 73(2): 143-147, (2012)

28) *"Low temperature Methane Sensing by Electrochemically Grown Pd modified Zinc Oxide"*, P.K Basu, **S. K. Jana**, H. Saha and S. Basu, **Sensors and Actuators B**, Vol. 135: 81–88, (2008).

29) *"Low-temperature hydrogen gas sensors based on electrochemically deposited and surface modified nanoporous ZnO thin films",* P. K. Basu, **S. K. Jana**, M. K. Mitra, H. Saha and S. Basu, **Sensor Letters**, **American Scientific Publishers (ASP)**, Vol. 6(5): 699-704, (2008).

30) *"Schottky Junction Methane Sensors Using Electrochemically Grown Nanocrystalline-Nanoporous ZnO Thin Films"* P. K. Basu, N. Saha, **S. K. Jana**, H. Saha, A. Lloyd Spetz, and S. Basu, **Research article Hindawi Publishing Corporation, Journal of Sensors**, Vol. 2009, (2009).

31) *"A Log Amplifier Based Linearization Scheme for Thermocouples"*, Nikhil Mondal, A. Abudhahir, **S. K. Jana**, Sugata Munshi and D. P. Bhattacharya**, Sensors & Transducers Journal**, Vol. 100: 1-10, (2009).

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34) *"Study of Electrochemical Reduced Graphene Oxide and MnO_2 Heterostructure for Supercapacitor Application"*, **S. K. Jana**, V. P. Rao and S. Banerjee, **AIP Conf. Proc.**, 1512, 516 (2013).

35) *"Enhancement of Photoelectrochemical Properties of TiO_2 Nanotube Loaded With Gold Nanoparticles",* **S. K. Jana**, T. Majumder, S. Majumder and S. Banerjee, **AIP Conf. Proc.,** 1536, 109 (2013).

*N.B. †Authors have same contribution and * author is serving as corresponding author*

Conference proceedings

1) "*Impedance spectroscopy probed electrochemical measurements on MoS_2 nanosheets for superior AC line filtering application*", **S. K. Jana,** M. Chatti, H. R. Inta, V. Mahalingam, Oral presentation in ICMST'16, 5-8th June, 2016, Pala, Kerala, India.

2) "*3D dendritic α-Fe_2O_3 nano-architectures: Synthesis and its application on electrochemical non-enzymatic H_2O_2 sensing",* Sumit Majumder, Barnamala Saha, Subhrajyoti Dey, Kousik Bagani, Mayukh Kumar Roy, **Sourav Kanti Jana**, Sanjay Kumar, Sangam Banerjee, Proceedings of the **59th DAE Solid State Physics Symposium 2014,** IIT Bombay.

3) *"Electrodeposited nanostructured MnO2 for non-enzymatic hydrogen peroxide sensing",* Barnamala Saha, **Sourav Kanti Jana,** Sangam Banerjee, Proceedings of the **59th DAE Solid State Physics Symposium 2014,** VIT University.

4) "*UV assisted catalytic effect of electrochemically anodized TiO_2 nanotube for hydrogen generation*", **S. K. Jana** and S. Banerjee, Abstract presentation in International Conference on Electron Microscopy and XXXIV Annual Meeting of the Electron Microscope Society of India (**EMSI**), July 3 - 5, **2013**, Kolkata, INDIA.

5) *"Study of electrodeposited MnO_2 for hydrogen peroxide sensor"*, B. Saha, N. Jain, **S. K. Jana** and S. Banerjee, Abstract presentation in International Conference on Electron Microscopy and XXXIV Annual Meeting of the Electron Microscope Society of India (**EMSI**), July 3 - 5, **2013**, Kolkata, INDIA.

6) *"Study of Electrochemical Reduced Graphene Oxide and MnO_2 Heterostructure for Supercapacitor Application"*, **S. K. Jana**, V. P. Rao and S. Banerjee, DAE SSPS: 3-7 December 2012, IIT Mumbai, India.

7) *"Enhancement of Photoelectrochemical Properties of TiO_2 Nanotube Loaded With Gold Nanoparticles"*, **S. K. Jana**, T. Majumder, S. Majumder and S. Banerjee, Recent trends in Advance Materials (**RAM'2013):** 1-2 February 2013, Bikaner Rajasthan**,** India.

8) "*Low Temperature Methane Detection Using Chemically Modified Nanoporous ZnO Thin Film Sensors*", S. Basu**, S. K. Jana**, P. K. Basu and H. Saha, 12th International Meeting on Chemical Sensors (IMCS 12), 13-16 July, 2008: Columbus, OH, USA.

Patent Filed / Application

(i) "An Integrated CDI Electrode" , *T. Pradeep, R. Islam, S. Sen Gupta, P. Srikrishnarka,* ***S. K. Jana*****,** **US Patent** US20200331778A1, 22nd October, 2020.

(ii) "Method for Generating Different Phases of Copper Sulphide Nanostructures using Electrospray Deposition (ESD) under Ambient Conditions**",** *T. Pradeep, A. Jana,* ***S. K. Jana****, D. Sarkar,* Patent no.IN2019/41032379 filed on 9th August'2019, Date of grant: 5th May, 2022

(iii) "A point-of-care (POC) amperometric device for selective arsenic sensing", *T. Pradeep,* ***S. K. Jana****, K. Chaudhari, R. Islam,* Publication no. WO/2021/245689 Application no. PCT/IN2021/050496.

(iv) "A method of ionization on a 2D-nanostructured surface", *T. Pradeep, P. Basuri,* ***S. K. Jana,*** *B. Mondal, February 02, 2021*, Application No.: 202141004464., Date of grant: 3rd December, 2021.

(v) "Method of fabricating a conducting cloth based breath humidity sensor and applications thereof", *T. Pradeep, B. George, P. Srikrishnarka, R. M. Dashi,* ***S. K. Jana***. Application No. 202241008331, Date of Filing: 17/02/2022

Work experiences in sponsored research projects

I have been working as a Senior Project Officer of DST Unit of Nanosciences and Thematic Unit of Excellence, Department of Chemistry, IITM from December'2016 to till now. I have been responsible for the execution and management of several national and international projects.
Details of the same are given below.

Sl. No.	Project Title	Name of the Collaborating Scientist and Institute	Sponsoring Agency	Budget in lakh (INR)	Status
1	Development of a novel combined arsenic filtration/monitoring system for community	Dr. David Sarphie, Bio Nano Consulting, United Kingdom	GITA, India	80	Completed

	scale water supplies				
2	Development of capacitive deionization technology for the extraction of germanium and selenium: Two elements of strategic relevance	N/A	Ministry of Mines	65	Completed

School / Workshop attendance

(i) European summer school, "***Physics Chemistry of Advanced Materials for Energetics***", Milano Italy, September, 2009

Fellowships / Awards / Recognition

(i) National Talent Search Test qualified in Secondary class, 29th March 1995

(ii) National Scholarship of Govt. of India for post graduate study, 30th July 2002

(iii) Graduate Aptitude Test in Engineering (GATE) scholarship from All India Council of Technical Education (AICTE), 2006-2008, Govt. of India

(iv) CORIMOV fellowship for Ph. D, University of Milano Bicocca, Milano, Italy

(v) Institute Fellowship of Saha Institute of Nuclear Physics (SINP), India for Post Doctoral position, May' 2012 – 6th January 2015

(vi) Institute Fellowship of Indian Institute of Science Education and Research Kolkata, Year: 2015

(vii) **Outstanding reviewer of Journal of Alloys and Compounds (Elsevier), July 2017**

(viii) **Outstanding reviewer of Materials Letters (Elsevier), November, 2016**

(ix) **Recognized reviewer of Journal of Power Sources (Elsevier)**

(x) **Recognized reviewer for ACS Publications reviewing activity**

Reviewer/Member of Professional Bodies

- Nanoscale (RSC)
- ACS Applied Materials and Interfaces(ACS)
- Journal of Physical Chemistry C (ACS)
- Physical Chemistry Chemical Physics (RSC)
- Journal of Power Sources (Elsevier)
- Materials Letter (Elsevier)

- Journal of Alloys and Compounds (Elsevier)
- Materials Research Express (IOP)
- Member of American Chemical Society

List of Referees

1. **Prof. T. Pradeep**
   HSB 148,
   DST Unit of Nanoscience and Thematic Unit of Excellence
   Department of Chemistry
   IIT Madras, Chennai- 600036
   Tamilnadu, India
   e-mail: pradeep@iitm.ac.in
   (+91) 44- 2257 5938
   home page: http://www.dstuns.iitm.ac.in/pradeep-research-group.php#

2. **Prof. Simona Binetti**
   Department of Material Science
   University of Milano Bicocca
   Via. R. Cozzi 53
   Milano Italy
   Phone (+39) 02 6448 5177
   Fax (+39) 02 6448 5400
   Home page: http://www2.mater.unimib.it/utenti/cfs/binetti.htm

3. **Prof. Sangam Banerjee**
   Surface Physics and Material Science Division
   Saha Institute of Nuclear Physics
   1/AF Bidhannagar,
   Kolkata 700064, India
   e-mail: sangam.banerjee@saha.ac.in
   (+91) 33 2337 5345-49 (Extn: 3322)

4. **Prof. Venkataramanan Mahalingam**
   Department of chemical Science
   Indian Institute of Science Education and Research Kolkata
   Mohanpur, Nadia
   Pin. 741246
   Home page: http://mvenkat.weebly.com/
   Email: mvenkat@iiserkol.ac.in

Signature

Sourav Kanti Jana