

FACTILTY ACADEMIC PROFILE/CV



Anupam Karmakar [Ph.D. (Engg.), M.Tech., B.Tech., B. Sc. (Phy-H)]

Professor and Chairperson [UGBOS (Electronics)]

Department of Electronic Science

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Specialization: Semiconductor Nano-Science & Nano-Technology, Sensors, Microwave Systems, Circuits & Devices, and Antennas

Academic Qualifications:

- **Ph. D. (Engg.)** (2004) in Electronics & Telecommunication Engineering, Jadavpur University, Kolkata, India.
- **M. Tech.** (1990) in Radiophysics and Electronics, University of Calcutta, Kolkata, India.
- **B. Tech.** (1988) in Radiophysics and Electronics, University of Calcutta, Kolkata, India.
- **B. Sc.** (1985) in Physics (Honours), University of Calcutta, Kolkata, India.

Positions held/holding:

- **Professor (June 2010 – continuing)**, Department of Electronic Science, University of Calcutta, India.
- **Associate Professor (August 2006 – June 2010)**, Department of Electronic Science, University of Calcutta, India.
- **Reader (August 2003 – July 2006)**, Department of Electronic Science, University of Calcutta, India.
- **Senior Lecturer (May 1998 – July 2003)**, Department of Electronics and Communication Engineering, Kalyani Government Engineering College, West Bengal, India.
- **Lecturer (November 1991 – April 1998)**, Department of Electronics Engineering, National Institute of Technology, Jamshedpur, India.
- **Head of the Department** of Electronic Science, University of Calcutta (**2011 – 13, 2015 – 17 & 2019 – 2021**).
- **Chairperson**, UGBOS (Electronics), University of Calcutta (**2015 – continuing**).
- **Member**, UGBOS (Electronics), University of Calcutta (**2004 – 2015**).
- **Member (Nominee of the University of Calcutta)**, Post Graduate Board of Studies in Electronic Science, Dinabandhu Andrews College (**2015 – 2019**).
- **Member (Nominee of the Vice-Chancellor, West Bengal State University)**, Post Graduate Board of Studies in Electronic Science, Acharya Prafulla Chandra College (**2015 – 2019**).
- **Secretary of the International Conference on Electronic and Photonic Materials, Devices and Systems – 2006 (EPMDS – 2006)** held on 4-6 January, 2006 at Kolkata organized by the Department of Electronic Science, University of Calcutta.

Research Interests: Semiconductor Nano-Science & Nano-Technology, Sensors

Research Guidance:

- Number of researchers awarded Ph. D. degree: **07**
- Number of researchers pursuing Ph. D.: **04**

List of Book/Book Chapter:

- A. Roy, D. Bhattacharya, C. Das, B. Nag Chowdhury, A. Karmakar and S. Chattopadhyay: "Voltammetric detection and controlled inhibition of decarboxylation of gallic acid (GA) in green tea using eugenol", *Emerging Electronic Devices, Circuits and Systems*, Springer, Singapore, pp. 181-190 (May 2023).
- D. Bhattacharya, A. Roy, C. Das, B. Nag Chowdhury, A. Karmakar and S. Chattopadhyay: "Comparative analysis of normal and anemic RBC by employing impedimetric and voltammetric studies", *Emerging Electronic Devices, Circuits and Systems*, Springer, Singapore, pp. 259-268 (May 2023).
- J. Sultana, S. Paul, **A. Karmakar**, S. Chattopadhyay: "Investigating the growth-time dependent comparative performance of vapour-liquid-solid (VLS) grown p-CuO/n-Si thin film hetero-junction solar cells", *Advances in Optical Science and Engineering*, Springer Proceedings in Physics, Chapter: Green Photonics: Applied Photovoltaics, Application of Solar Energy, Organic Photovoltaics, Springer, 194, pp. 157-164, (September 2017).
- S. Paul, J. Sultana, A. Banerjee, P. Singha, **A. Karmakar**, S. Chattopadhyay: "Electrical characterization of n-ZnO NW/p-CuO thin film hetero-junction solar cell Grown by chemical bath deposition and vapor liquid solid technique with varying reaction time", *Advances in Optical Science and Engineering*, Springer Proceedings in Physics, 194, pp. 165-171, (September 2017).
- R. Saha, A. Das, **A. Karmakar**, N. R. Saha, S. Chattopadhyay: "Investigation of oxygen vacancy induced resistive switching memory behavior in low-temperature grown n-ZnO/p-Si heterojunction diode", *Computational Science and Engineering*, Chapter: Heterojunction devices and circuits, Taylor & Francis, pp. 225-229, (October 2016).
- J. Sultana, S. Paul, **A. Karmakar**, S. Chattopadhyay: "Studying the comparative performance of p-CuO/n-Si thin film hetero-junction solar cells grown by chemical bath deposition and vapor liquid solid processes", *Computational Science and Engineering*, Chapter: Heterojunction devices and circuits, Taylor and Francis, pp. 221-225 (October 2016).

Extramural Research Grant:

- **Principal Investigator** of the SERB, DST, GoI sponsored project: "Point-of-Care electronic diagnosis of anemic diseases by employing impedimetric techniques" (21/05/2019 – 20/11/2022).
- **Co-Investigator** of the SERB, DST, GoI sponsored project: "Device design and optimization of complementary tunnel FETs for low-power applications and their variability study" (18/09/2013 – 30/11/2016).

- **Co-Investigator** of the DST, GoI sponsored project: “Study and modeling of tunnel field-effect transistor” (17/07/2009 – 12/01/2013).
- **Principal Investigator** of the UGC, GoI sponsored project: “Device design and modeling of sub-45nm Schottky-barrier MOSFETs” (01/02/2010 – 31/01/2013).

List of Honours/Awards:

- **National Scholarship**, Ministry of Education and Culture, Govt. of India (1980) on the basis of Madhyamik Pariksha (Secondary Examination) 1980.
- **National Scholarship** continued on the basis of Higher Secondary Examination 1982.
- **National Scholarship** continued on the basis of B. Sc. (Honours) Examination 1985.

Membership in Scientific Bodies:

- Life member of ISTE
- Life member of IACS

Editor/or Editorial Board Member etc.:

- **Jointly edited** Proceedings of the International Conference on Electronic and Photonic Materials, Devices and System (EPMDS-2006, January 4-6, 2006) organized by the Dept. of Electronic Science, University of Calcutta, Kolkata, India, published by the University of Calcutta Press.

Journal Papers:

- R. Saha, S. Chakrabarti, **A. Karmakar** and S. Chattopadhyay: “Investigation of Yttrium (Y)-doped ZnO (Y:ZnO)-Ga₂O₃core-shell nanowire/Si vertical heterojunctions for high performance self-biased wideband photodetectors”, *Journal of Materials Science: Materials in Electronics*, 34(8): 759 (March 2023).
- A. Roy, C. Das, B. Nag Chowdhury, D. Bhattacharya, **A. Karmakar** and S. Chattopadhyay: “Investigating the impact of eugenol on the suppression of gallic acid oxidation by employing cyclic voltammetry”, *Research Square*, DOI: 10.21203/rs.3.rs-2594084/v1 (20 February 2023).
- S. Mandal, C. Das, S. Sikdar, B. Nag Chowdhury, P. Singha, A. Banerjee, **A. Karmakar** and Sanatan Chattopadhyay: “Development of substrate engineered Si-⟨111⟩/[100] patterned features by anisotropic wet etching with Pt/Pt₃Si mask”, *Materials Chemistry and Physics*, Vol. 291, 126783 (November 2022)
- R. Saha, S. Chakrabarti, **A. Karmakar** and S. Chattopadhyay: “Yttrium (Y) doped ZnO nanowire/p-Si heterojunction devices for efficient self-powered UV-sensing applications”, *Vacuum*, Vol. 202, 111214 (August 2022).
- A. Roy, C. Das, B. Nag Chowdhury, D. Bhattacharya, **A. Karmakar** and S. Chattopadhyay: “Investigating the impact of Eugenol on the suppression of gallic acid oxidation by employing cyclic voltammetry”, *SSRN Electronic Journal*, (January 2022).
- S. Paul, J. Sultana, N. R. Saha, G. Dalapati, **A. Karmakar** and S. Chattopadhyay: “Impact of seed layer annealing on the optoelectronic properties of double-step CBD grown n-ZnO nanowires/p-Si heterojunctions”, *Optik*, 228, p. 166141 (February 2021).

- S. Chakraborty, R. Saha, **A. Karmakar** and S. Chattopadhyay: "Fabrication and characterization of zinc oxide nanowire based two-electrode capacitive biosensors on flexible substrates for estimating glucose content in a sample", *Electroanalysis*, 33(5) (January 2021).
- C. Das, B. Nag Chowdhury, S. Chakraborty, S. Sikdar, R. Saha, A. Mukherjee, **A. Karmakar** and S. Chattopadhyay: "A diagrammatic approach of impedimetric phase angle-modulus sensing for identification and quantification of various polar and nonpolar/ionic adulterants in milk", *LWT- Food Science and Technology* 136, p. 110347 (October 2020).
- S. Chakraborty, S. Das, C. Das, S. Chandra, K. Das Sharma, **A. Karmakar** and S. Chattopadhyay: "On-chip estimation of hematocrit level for diagnosing anemic conditions by impedimetric techniques", *Biomedical Microdevices*, 22, p. 38 (20 May 2020).
- R. Saha, **A. Karmakar** and S. Chattopadhyay: "Enhanced self-powered ultraviolet photo response of ZnO nanowires/p-Si heterojunction by selective in-situ Ga doping", *Optical Materials*, 105, p. 109928 (July 2020).
- S. Chakraborty, C. Das, K. Ghoshal, M. Bhattacharyya, **A. Karmakar**, S. Chattopadhyay: "Low frequency Impedimetric cell counting: analytical modeling and measurements", *IRBM*, 41(1), pp. 23-30 (February 2020).
- J. Sultana, S. Paul, R. Saha, S. Sikdar, **A. Karmakar** and S. Chattopadhyay: "Optical and electronic properties of chemical bath deposited p-CuO and n-ZnO nanowires on silicon substrates: p-CuO/n-ZnO nanowires solar cells with high open-circuit voltage and short-circuit current", *Thin Solid Films*, 699, p. 137861 (15 February 2020).
- R. Saha, S. Sikdar, B. N. Chowdhury, **A. Karmakar**, and S. Chattopadhyay: "Catalyst-modified vapor-liquid-solid (VLS) growth of single crystalline β -Gallium Oxide (Ga₂O₃) thin film on Si-substrate", *Superlattices and Microstructures*, 136, p. 106316 (23 October 2019).
- C. Das, S. Chakraborty, N. K. Bera, D. Chattopadhyay, **A. Karmakar** and S. Chattopadhyay: "Quantitative estimation of soda ash as an adulterant in aqueous sucrose solution by employing electrical impedance and capacitance spectroscopy", *Measurement*, 148, p. 106937 (12 August 2019).
- J. Sultana, A. Bhattacharya, **A. Karmakar**, G. K. Dalapati and S. Chattopadhyay: "Graphene-nanoparticle incorporated responsivity tuning of p-CuO/n-Si-based heterojunction photodetectors", *Bulletin of Materials Science*, 42(4), p. 194 (14 June 2019).
- R. Saha, N. R. Saha, **A. Karmakar**, G. K. Dalapati, and S. Chattopadhyay: "Generation of oxygen interstitials with excess in situ Ga doping in chemical bath deposition process for the growth of p-type ZnO nanowires", *Journal of Materials Science: Materials in Electronics*, 30(9), pp. 8796-8804 (28 March 2019).

- C. Das, S. Chakraborty, N. K. Bera, K. Acharya, D. Chattopadhyay, **A. Karmakar** and S. Chattopadhyay: "Impedimetric approach for estimating the presence of metanil yellow in turmeric powder from tunable capacitance measurement", *Food Analytical Methods*, 12(4), pp. 1017-1027 (15 April 2019).
- J. Sultana, S. Paul, A. Karmakar, G. K. Dalapati and S. Chattopadhyay: "Optimizing the thermal annealing temperature: technological route for tuning the photo-detecting property of p-CuO thin films grown by chemical bath deposition method", *Journal of Materials Science: Materials in Electronics*, 29 (15), pp. 12878-12887 (1 June-2018)
- R. Saha, A. Das, **A. Karmakar** and S. Chattopadhyay: "Self-rectifying threshold resistive switching based non-volatile memory of CBD/CBD grown vertical n-ZnO nanowire/p-Si heterojunction diodes", *Advanced Materials Proceedings*, 3(4), pp. 298-303, (April 2018).
- A. Das, R. Saha, S. Guhathakurata, S. Pal, N. R. Saha, H. S. Dutta, **A. Karmakar** and S. Chattopadhyay: "Tuning of transport properties of the double-step chemical bath deposition grown zinc oxide (ZnO) nanowires by controlled annealing: An approach to generate p-type ZnO nanowires", *Thin Solid Films*, 649, pp. 129-135, (March 2018).
- S. Paul, J. Sultana, A. Bhattacharyya, **A. Karmakar** and S. Chattopadhyay: "Investigation of the comparative photovoltaic performance of n-ZnO nanowire/p-Si and n-ZnO nanowire/p-CuO heterojunctions grown by chemical bath deposition method", *Optik*, 164, pp. 745-752, (March-2018).
- C. Das, S. Chakraborty, K. Acharya, N. K. Bera, D. Chattopadhyay, **A. Karmakar** and S. Chattopadhyay: "FT-MIR supported Electrical Impedance Spectroscopy based study of sugar adulterated honeys from different floral origin", *Talanta*, 171, pp. 327-334, (May 2017).
- S. Chakraborty, C. Das, N. K. Bera, D. Chattopadhyay, **A. Karmakar** and S. Chattopadhyay: "Analytical modelling of electrical impedance based adulterant sensor for aqueous sucrose solutions", *Journal of Electroanalytical Chemistry*, 784, pp. 133-139, (January 2017).
- J. Sultana, S. Paul, **A. Karmakar** and S. Chattopadhyay: "Efficiency enhancement of p-CuO/n-Si heterojunction solar cells: Impact of annealing on the photovoltaic properties of Vapour-Liquid-Solid (VLS) grown ultra-thin CuO film", *Materials Today: Proceedings*, 4(14), pp. 12694-12697, (January 2017).
- S. Paul, J. Sultana, **A. Karmakar** and S. Chattopadhyay: "Effect of prolonged growth on the chemical bath deposited ZnO nanowires and consequent photovoltaic performance of n-ZnO NWs/p-CuO heterojunction solar cells", *Materials Today: Proceedings*, 4(14), pp. 12496-12499, (January 2017).
- J. Sultana, S. Paul, **A. Karmakar**, Ren Yi c, G. K. Dalapati and S. Chattopadhyay: "Chemical bath deposited (CBD) CuO thin films on n-silicon substrate for electronic and optical applications: Impact of growth time", *Applied Surface Science*, 418 (Part A), pp. 380-387, (October 2017).

- S. Chakraborty, **A. Karmakar** and S. Chattopadhyay: "Recent Advances in Lab-On-a-Chip [LOC] Impedimetric Biosensors Integrated with Digital Microfluidic System", *B.N. Seal Journal of Science*; VIII (1), (September 2016).
- S. Chakraborty, C. Das, **A. Karmakar** and S. Chattopadhyay: "Analyzing the quasi-oscillatory nature of electrical parameters with the concentration of sucrose in aqueous solution at room temperature", *Advanced Materials Proceedings*, 4(2), pp. 6-12, (August 2016).
- J. Sultana, A. Das, A. Das, N. R. Saha, **A. Karmakar** and S. Chattopadhyay: "Characterization of nano-powder grown ultra-thin film p-CuO/n-Si hetero-junctions by employing vapour-liquid-solid method for photovoltaic applications", *Thin Solid Films*, 612, pp. 331-336, (August 2016).
- S. Paul, A. Das, M. Palit, S. Bhunia, **A. Karmakar**, S. Chattopadhyay: "Investigation of the properties of single-step and double-step grown ZnO nanowires using chemical bath deposition technique", *Advanced Materials Letters*, 7(8), pp. 610-615, (August 2016).
- A. Das, A. Kushwaha, R. K. Sivasayan, S. Chakraborty, H. S. Dutta, **A. Karmakar** and S. Chattopadhyay, D. Chi, G. K. Dalapati: "Temperature-dependent electrical characteristics of CBD/CBD grown n-ZnO nanowire/p-Si heterojunction diodes", *Journal of Physics D: Applied Physics*, 49(14), (March 2016).
- S. Chakraborty, C. Das, **A. Karmakar** and S. Chattopadhyay: "Analyzing the quasi-oscillatory nature of electrical parameters with the concentration of sucrose in aqueous solution at room temperature", *Advanced Material Proceedings* 1(1), pp. 25-31 (2016).
- S. Chakraborty, C. Das, R. Saha, A. Das, N. K. Bera, D. Chattopadhyay, **A. Karmakar** and D. Chattopadhyay, and S. Chattopadhyay: "Investigating the quasioscillatory behavior of electrical parameters with the concentration of D-glucose in aqueous solution", *Journal of Electrical Bioimpedance*, 6, pp. 10-17, (2015).
- A. Das, M. Palit, S. Paul, B. Nag Chowdhury, H. S. Dutta, **A. Karmakar** and S. Chattopadhyay: "Investigation of the electrical switching and rectification characteristics of a single standalone n-type ZnO-nanowire/p-Si junction diode", *Applied Physics Letters*, 105, pp. 083106-1-4 (August 2014).
- S. Guin, A. Chattopadhyay, **A. Karmakar** and A. Mallik: "Impact of a Pocket Doping on the Device Performance of a Schottky Tunneling Field-Effect Transistor", *IEEE Trans. Electron Devices*, vol. 61, no. 7, pp. 2515-2522, (July 2014).
- A. Raha, M. K. Naskar, A. Paul, A. Chakraborty, **A. Karmakar**: "A genetic algorithm inspired load balancing protocol for congestion control in wireless sensor networks using trust based routing framework (GACCTR)", *International Journal of Computer Network and Information Security (IJCNIS)*, Vol. 5, No.9, pp. 9-20 (July 2013).
- A. Mallik, A. Chattopadhyay, S. Guin, and **A. Karmakar**: "Impact of a spacer-drain overlap on the characteristics of a silicon tunnel field-effect transistor based on vertical tunneling", *IEEE Trans. Electron Devices*, vol. 60, no. 3, pp. 935-943, (March 2013).

- A. Chakraborty, A. Raha, S. Maity, M. K. Naskar, **A. Karmakar**: “A fuzzy based trustworthy route selection method using LSRP in wireless sensor networks (FTRSP)”, *ACM DL*, pp. 413-419, (October 2012).
- B. Datta, A. Karmakar, M. K. Naskar: “Multiple access scheme for multi-symbol encapsulated orthogonal frequency division multiplexing”, *International Journal of Multimedia and Its Applications (IJMA)*, vol. 3, no. 4, pp. 133-142, (November 2011).
- S. Basu, J. Gope, **A. Karmakar**, K. S. Kumar, S. K. Sarkar, Subir Kumar Sarkar, “Influence of mixed oxide interfacial layer on the response characteristics of submicron AlGaAs practical MESFET”, *International Journal of Engineering Research and Industrial Application*, vol. 2, no. IV, pp. 173-184 (2009).
- S. K. Sarkar, A. K. De, **A. Karmakar**: “Influence of the non-equilibrium longitudinal optic phonons on the carrier transport in GaAs quantum wells under hot electron conditions”, *Journal of Technology*, vol. 37, no. 1, pp. 1-10 (2003).
- Subir Kumar Sarkar, **A. Karmakar** and A. K. Dey: “Influence of non-equilibrium LO phonons on high frequency performance of 1D hot electrons in quantum wires of polar semiconductor”, *Czech. J. Phys.* vol. 51, pp. 249-256 (2001).
- Subir Kumar Sarkar, **A. Karmakar** and A.K. Dey: “Magneto quantum effects on microwave and millimeterwave response on 2D hot electron in n-(Hg,Cd)Te QWs”, *Indian Journal of Physics*, 75A (3) pp.267-269(2001).
- **A. Karmakar**, A. K. De and Subir Kumar Sarkar: “Low temperature Galvanometric transport in GaN QWs for degenerate hot electron condition”, *Physics Teacher*, vol. 42, pp. 15-18 (2000).

Conference Papers:

- D. Bhattacharya, A. Roy, C. Das, B. Nag Chowdhury, A. Karmakar and S. Chattopadhyay: “Comparative analysis of normal and anemic RBC by employing impedimetric and voltammetric studies”, *Proceedings of International Symposium on Devices, Circuits and Systems (ISDCS2022)*, IEST-Shibpur, India (29-31 March 2022).
- A. Roy, D. Bhattacharya, C. Das, B. Nag Chowdhury, A. Karmakar and S. Chattopadhyay: “Voltammetric detection and controlled inhibition of decarboxylation of gallic acid (GA) in green tea using eugenol”, *Proceedings of International Symposium on Devices, Circuits and Systems (ISDCS2022)*, IEST-Shibpur, India (29-31 March 2022).
- D. Bhattacharya, S. Chakrabarti, A. Mukherjee, **A. Karmakar** and S. Chattopadhyay: “Design and simulation of an open EWOD based digital microfluidic device for droplet actuation using COMSOL”, *IWPSD2021*, IIT-Delhi, India (14-17 December 2021).
- A. Basak, S. Chakraborty, C. Das, A. Mukherjee, R. Saha, **A. Karmakar** and S. Chattopadhyay: “Electrically isolated buried electrode biosensor for detecting folic acid concentration”, *3rd International Symposium on Devices, Circuits and Systems, (ISDCS2020)*, IEST-Shibpur, India (4-6 March 2020).

- S. Mandal, S. Sikdar, R. Saha, **A. Karmakar** and S. Chattopadhyay: Investigating the impact of growth time on the electrical performance of vapour-liquid-solid (VLS) grown Ge/n-Si hetero-junction”, *3rd International Symposium on Devices, Circuits and Systems (ISDCS2020)*, IEST-Shibpur, India (4-6 March 2020).
- C. Das, S. Chakraborty, **A. Karmakar** and S. Chattopadhyay: “Comparative study for the impedimetric detection and quantification of adulterants in different bio-consumables”, *3rd International Symposium on Devices, Circuits and Systems (ISDCS2020)*, IEST-Shibpur, India (4-6 March 2020).
- S. Sikdar, B. Nag Chowdhury, **A. Karmakar** and S. Chattopadhyay: “Modeling of Si nanowire based vertical metal-oxide-semiconductor device for solar cell applications by employing NEGF formalism”, *International Seminar Cum Research Colloquium on MEMS based Sensors and Smart Nanostructured Devices (MSSND2019)*, Jadavpur University, India (27 December 2019).
- S. Chakraborty, C. Das, R. Saha, **A. Karmakar** and S. Chattopadhyay, A. Chatterjee, and M. Das: “Dielectric study of kidney stones by fabricating an MIS structure: Material analysis and challenges”, *International Seminar Cum Research Colloquium on MEMS based Sensors and Smart Nanostructured Devices (MSSND2019)*, Jadavpur University, India (27 December 2019).
- S. Chakraborty, C. Das, R. Saha, A. Mukherjee, **A. Karmakar** and S. Chattopadhyay: “Fabrication and characterization of zinc oxide nanowire based flexible devices for glucose sensing”, *International Workshop on the Physics of Semiconductor Devices (IWPSD2019)*, India (17-20 December 2019).
- S. Mandal, S. Dey, S. Sikdar, B. Nag Chowdhury, R. Saha, **A. Karmakar** and S. Chattopadhyay: “Parameter optimization in electron beam lithography for fabricating patterned nanostructures”, *XXth International Workshop on Physics of Semiconductor Devices (IWPSD2019)*, India (17-20 December 2019).
- A. Mukherjee, S. Chakraborty, C. Das, **A. Karmakar** and S. Chattopadhyay: “Study of optical and electrical characteristics of chemically extracted Lotus and Taro Bio-Wax for hydrophobic surface Engineering”, *International Conference on Opto-Electronics and Applied Optics (Optronix2019)*, UEM Kolkata, India (18-20 March 2019).
- R. Saha, **A. Karmakar** and S. Chattopadhyay: “Comparative investigation of Ga- and Sn-doped ZnO nanowires/p-Si heterojunctions for UV-photo sensing”, *International Symposium on Devices, Circuits and Systems (ISDCS2018)*, IEST (29-31 March 2018).
- S. Paul, J. Sultana, A. Sarkar, **A. Karmakar** and S. Chattopadhyay: “Chemical bath deposited nZnO nanostructures on p-Si substrate for photo-detecting applications: impact of annealing temperature”, *IEEE International Symposium on Devices, Circuits and Systems (ISDCS2018)*, IEST-Shibpur, India (29-31 March 2018).
- J. Sultana, S. Paul, S. Chowdhury, **A. Karmakar** and S. Chattopadhyay: “Film thickness dependent photovoltaic performance investigation of p-CuO/n-Si heterojunctions grown by chemical bath deposition process”, *IEEE International Symposium on Devices, Circuits and Systems (ISDCS2018)*, IEST-Shibpur, India (29-31 March 2018).

- C. Das, S. Chakraborty, **A. Karmakar**, and S. Chattopadhyay: “On-chip detection and quantification of soap as an adulterant in milk employing electrical impedance spectroscopy”, *IEEE International Symposium on Devices, Circuits and Systems (ISDCS 2018)*, IEST-Shibpur, India (29-31 March 2018).
- S. Chakraborty, C. Das, R. Saha, S. Das, R. Mishra, R. Mishra, **A. Karmakar**, and S. Chattopadhyay: “Bio-dielectric variation as a signature of shape alteration and lysis of human erythrocytes: an on-chip analysis”, *IEEE International Symposium on Devices, Circuits and Systems (ISDCS 2018)*, IEST-Shibpur, India (29-31 March 2018).
- A. Das, A. Mondal, H. S. Dutta, **A. Karmakar** and S. Chattopadhyay: “Enhancing the capability of Lock-In Amplifier to measure current-voltage characteristics of semiconductor devices”, *Second International Conference on Material Science (ICMS2017)*, Tripura University, India (16-18 February 2017).
- J. Sultana, S. Paul, A. Bhattacharya, **A. Karmakar** and S. Chattopadhyay: “Tuning the optical properties of p-CuO films by Graphene incorporation for superior p-CuO/n-Si heterojunction photo-detector performance, *IEEE Calcutta Conference (CALCON-2017)*, pp. 51-53, (2-3 December 2017).
- S. Paul, J. Sultana, A. Chakraborty, **A. Karmakar** and S. Chattopadhyay: “Thermal annealing of CBD-grown p-CuO/n-ZnO seeds and its impact on the performance of p-CuO/n-ZnO nanowire-based heterojunction photodetectors”, *IEEE Calcutta Conference (CALCON-2017)*, pp. 54-57, (2-3 December 2017).
- S. Chakraborty, C. Das, **A. Karmakar**, and S. Chattopadhyay: “Analyzing the quasio oscillatory nature of electrical parameters with the concentration of sucrose in aqueous solution at room temperature”, *International Conference on Materials Science & Technology (ICMST2016)*, University of Delhi, India (1-4 March 2016).
- A. Das, R. Saha, **A. Karmakar**, and S. Chattopadhyay, M. Palit, and H. S. Dutta: “Self-powered rapid binary UV photo switching with n-ZnO NW/p-Si photodiode”, *Proceeding of IEEE: International Conference on Microelectronics, Computing and Communications (MicroCom 2016)*, NIT-Durgapur, India (23-25 January 2016).
- S. Paul, A. Das, J. Sultana, **A. Karmakar** and S. Chattopadhyay and A. Bhattacharyya: “Performance investigation of n-ZnO nanowire/p-CuO thin film heterojunction solar cell grown by chemical bath deposition and vapour liquid solid technique”, *Proceeding of 6th International Conference on Computers and Devices for Communication (IEEE: CODEC2015)*, University of Calcutta, India (16-18 December 2015).
- A. Das, C. Das, R. Saha, **A. Karmakar**, S. Chattopadhyay, M. Plait, and H. S. Dutta: “Electrical characterization of n-ZnO nanowire/p-Si hetero-junction diode in presence of traps”, *Proceeding of 6th International Conference on Computers and Devices for Communication (IEEE: CODEC2015)*, University of Calcutta, India (16-18 December 2015).

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