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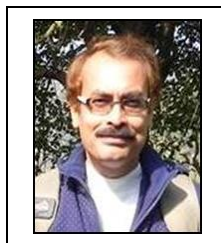


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# Brief Research Profile

## Utpal Deka



Dept. of Physics  
Manipal Institute of Technology Bengaluru  
Govindapura Village, Yelahanka,  
Bengaluru-560064, India

+91-8250592919, 8670395750  
Email : udeka1@rediffmail.com,  
: deka.utpal@gmail.com  
: deka.utpal@manipal.edu

Orcid: 0000-0003-0397-7223

Google Scholar: [scholar.google.com/citations?user=VvQpNgEAAA&hl=en](https://scholar.google.com/citations?user=VvQpNgEAAA&hl=en)

### Academic Qualifications:

1. Completed B.Sc. (Hons) in Physics in 1994 from Hindu College, Delhi University.
2. Completed M.Sc. in Physics, with Plasma and Space Physics in 1996 from Delhi University.
3. Got Ph.D. in Plasma Physics in 2005 Centre of Plasma Physics- Institute for Plasma Research for the Ph.D. Thesis titled “*Investigation of a few random problems on plasma sheath*”.
4. Did Post. Doc. Research in Plasma Physics from April 2003-Nov. 2003 from Centre of Plasma Physics- Institute for Plasma Research
5. Completed Certificate Course in Six Sigma Green Belt in 2014 from Indian Statistical Institute (SQC & OR)
6. Completed Online Course in Introduction to Quantum Computing from October -20 till May 21 from Qubit by Qubit: The Coding School, Los Angeles, USA

### Research Experience:

11.08.1998 – 30.11.2000: JRF in Institute for Advanced Study in Science & Technology, DST Institute, Guwahati, Assam  
01.12.2000 - 23.04.2003: JRF in Centre of Plasma Physics- Institute for Plasma, DAE Institute, Sonapur, Assam  
24.04.2003 -30.11.2003: Post Doc in Centre of Plasma Physics- Institute for Plasma Research, Sonapur, Assam

### Professional Experience:

01.01.2004 – 26.08.2004: Lecturer in Physics, St. Xavier’s Jr. Science College, Guwahati, Assam  
30.08.2004 - 02.03.2008: Lecturer (Asst. Prof. II) in Physics, Sikkim Manipal Institute of Technology, Sikkim  
03.03.2008 – 30.04.2009: Sr. Lecturer (Asst. Prof. I) in Physics, Sikkim Manipal Institute of Technology, Sikkim  
01.05.2009 - 09.03.2015: Reader and then Assoc. Prof in Physics, Sikkim Manipal Institute of Technology, Sikkim  
10.03.2015 – 31.10.2021: Addl. Professor in Physics, Sikkim Manipal Institute of Technology, Sikkim  
01.11.2021 – Till date: Addl. Professor in Physics, Manipal Institute of Technology, Bengaluru, Karnataka

### Administrative Experience:

01.02.2019 - Till date: Head of Department of Physics, Sikkim Manipal Institute of Technology, Sikkim.  
22.10.2020 - Till date: Coordinator, Institute IQAC Coordinator, Sikkim Manipal Institute of Technology, Sikkim.

### Awards and Honors:

1. Got **3rd PRIZE in POSTER PRESENTATION** in the First World Conference on Fracture and Damage Mechanics (FRACTURE – 2014) 9- 11 August, 2014 at Mahatma Gandhi University, Kottayam, Kerala, India.
2. Recipient of **3<sup>rd</sup> prize in the English Learning Workshop** conducted at SMIT by Sikkim Manipal University in December 2009.
3. Recipient of **Award for Exemplary Performance** from Sikkim Manipal University in November 2008.
4. Awarded “**Young Scientist Award**” under Fast Track Scheme for the young Scientist by DST, Govt. of India.
5. I was **one of the five invited research students** selected on the basis of overall performance in the SERC School held on the same subject in Kolkata to participate in a workshop on “*Plasma based particle accelerators*” held at Institute for Plasma Research, Gandhinagar in January 2004.
6. I was **selected to participate** in the SERC School on “*Plasma based particle accelerators*” held at SINP, Kolkata in February 2003.
7. I was awarded the **Plasma Science Society of India (PSSI) award** for the year 2000 to carry out interdisciplinary research work in the field of Plasma Physics.

8. I was again selected as a **JRF** in Centre of Plasma Physics, Dispur, Guwahati-781006, Assam.
9. Awarded **Junior Research Fellowship (JRF)** under DST, Govt. of India sponsored project titled “Development of Plasma Physics Division, IASST” at IASST, Guwahati.
10. I was also awarded **State Merit Scholarship** in 10+2.

### Major Research Areas/Projects:

Turbulent heating of Solar Corona, Effect of electron and plasma irradiation on perovskites manganites, Instabilities in semiconductor Quantum Plasma, Heat transmittance through the plasma sheath, Si Nanowire based Hybrid Solar Cells, Plasma simulation on the separatrix problem in Steady State Tokamak-1, Plasma surface interaction interaction, Electron inertial delay effect on Ion Acoustic wave and Debye sheath, Nonlinear Oscillations in the Glow Discharge plasma; Plasma presheath and sheath, Quantum Computation and Quantum Information Technology.

### Research Facility Establishments:

Worked as a member of the local committee for International Centre on Nanotechnology and Applied Adhesion to opened in SMIT Campus, installed a plasma generation unit to do some basic plasma experiments in plasma glow discharge. This facility is used for research and M.Sc. level experiments also, Surface modification of materials using glow discharge plasma, High vacuum Thermal Evaporation coating

### Teaching Experience:

- 30.08.2004– 26.08.2004: Taught Engineering Physics at H.S. level.  
 30.08.2004 - 31.05.2019: Taught Engineering Physics both Theory and Experiment at B.Tech.  
 30.08.2004 - 31.10.2021: Teaching M.Sc. (Physics) both Theory and Experiment at M.Sc. level.  
 Subjects taught: Quantum Mechanics, Statistical Mechanics, Solid State Physics, Computational Physics, C-Programming and General Physics Lab, Computational Physics Lab in various semesters in these years.  
 01.11.2021 - Till Date: Teaching B.Tech. (Engg Physics) both Theory and Experiment and offered Open Elective on Quantum Computing.

### Sponsored Research Projects:

1. **Departmental Infrastructure Upgradation project**, “Upgradation of Infrastructural Facilities in the Department of Physics, SMIT”, Co-Investigator funded by D.S.T., Govt. of India under **FIST, Level-I** to Dept. of Physics, SMIT. 2006
2. **Simulation Research project** to “Investigate the flaring of the magnetic field lines near the divertor plates in fusion devices for redistributing the heat load”, **PI:** Dr. U. Deka, Co.I, Dr. V. K. Sayal from SMIT and Dr. S. Depande, Dr. R. Srinivasan from IPR funded by BRFSST-India (Completed) file no: NFP/04/2007-14, Project Ref. No. NFP/TH&SIM/03  
 Area of Research: Simulation in Fusion Research.
3. **Theoretical Research project** to “Investigation of Propagation of Ion Acoustic Wave in Plasma Sheath and Presheath”, **PI:** Dr. U. Deka, funded by DST, Govt. of India file no: SR/FTP/PS-69/2007 (Completed)  
 Area of Research: Theoretical and Computational Plasma Physics.
4. **Experimental Project:** “Graphene Back Surface Field Based Low Cost Silicon Nanowire Hybrid Solar Cell”. **PI:** Dr. U. Deka, **CoPI:** Dr. B. Pd. Swain (Reference SMU/ENDOW/2016-17/292/002) Funded under Dr. Ramdas Pai and Mrs. Vasanthi Pai Endowment Fund
5. **Experimental Project:**” Synthesis and Characterization of Semiconductor Oxide Nanostructures for Photovoltaic Applications. **PI:** Dr. S. Das, **CoPI:** Dr. U. Deka (Reference 6100/SMIT/R&D/Project/12/2020) dated 20/07/2020 Funded under T.M.A. Pai University Research Fund

### Memorandum of Understanding (MoUs) with Research Institutes/Universities:

1. Collaborative research work for Lightning Detection System established at SMIT by National Remote Sensing Centre, Hyderabad under joint research work and collaborative work between Physics Dept, SMIT and NRSC, Hyderabad through MoU.

### Thesis/Dissertation Supervisor:

## Thesis Guidance for Ph.D.:

### Completed:

1. “Effect of Electron Beam and Plasma Irradiation on the Structural, Electrical and Thermal Properties of Perovskite Manganites”. Pronita Chettri (Regn. No. 201610013) (**Awarded Nov 2021**)
2. “Fabrication and Characterization of Silicon Nanowire Hybrid Solar Cell” Rabina Bhujel (**Awarded March 2021**)

### Pursuing:

1. “Instabilities in semiconductor quantum plasma in presence of Electric and Magnetic fields” Krishna Sharma (Regn. No. 202010001) (Ongoing; Registered in 2019) (CSIR-UGC/GATE/DST INSPIRE Fellow)
2. “The Study of compressibility of MHD Waves in perspective of turbulence heating of solar coronal”, Mr. Bivek Pradhan (Registered in 2021)
3. “Study of the effect of electron and plasma irradiation on the morphological and magnetic phase of perovskite manganites” Proposed Ph.D. topic for Nopu Ongay Bhutia CSIR-UGC JRF (Registered in 2021)
4. “Investigation of the effect of electron beam irradiation on the structural, electrical, and thermal properties of some doped and composite rare earth-based perovskite manganites” Pragati Pradhan (registration under process joined in March 2022)

## M.Sc. dissertation Guidance:

Guided 31 M.Sc. dissertations projects.

## Editorial Board Members:

- (a) Member of Editorial Board of International Journal of Physics,
- (b) Editorial Board of Oriental Science,
- (c) Member of Editorial Board of Research Journal of Physical and Applied Sciences,
- (d) Member of Advisory Board for *Educon Global Pvt. Ltd.*, ([www.educonglobal.com](http://www.educonglobal.com)).

## Reviewer of research paper and Thesis:

- (a) Reviewer of PhD/M.Tech. Thesis of different Universities/Institutes/IIT.
- (b) Reviewed research papers in the area of plasma physics for International Journals like IEEE Trans on Plasma Science, European Physics Letter, Chaos, Journal of Applied Physics, Journal of Oceanography and Marine Science (JOMS), Plasma Sc. and Technol., Canadian Jnl. of Phys., Global Jnl. Inc. (USA), Int. Jnl. of Phys., Chinese Journal of Physics, Physics of Plasma, Results in Physics, Physical Sciences Research International, Universal Journal of Physics, Review of Scientific Instruments, etc.
- (c) Reviewed book on Engineering Physics from the Tata-McGraw Hill Publisher.

## Editor/Author of Books:

- (a) Editor of the Book “Proceedings of the 6<sup>th</sup> PSSI Plasma Scholars Colloquium 24-26 August, 2018” (ISBN: 978-93-86947-68-0).
- (b) I am a co-author of the Physics Module prepared as a part of the “Sikkim School Teacher’s Training Program in Science”, published by Ministry of HRD, Govt. of Sikkim and Ministry of HRD, Govt of India, Dec. 2010.
- (c) Author of B.Tech Engineering Laboratory Manual in collaboration with few other faculty members of the department.
- (d) Author of M.Sc. Laboratory Manual in collaboration with few other faculty members of the department.

## Papers published in National/International Journals:

- 1) “Oxygen plasma-induced enhancement of structural, electrical properties, and thermopower of  $\text{La}_{0.5}\text{Sr}_{0.5}\text{MnO}_3$ ”, Pronita Chettri, Arun Sarma G.S. Okram, Ashok Rao, Utpal Deka Applied Physics A: Material Science and Processing 128 (2022) 821 (1-10) **SCI IF: 2.584, Q2**
- 2) “Athermal GES-based solar plasma stability with sphero-logabarotropic special effects”, P. K. Karmakar, U. Deka, European Physics Letter (accepted available online June 2022, [doi.org/10.1209/0295-5075/ac7c32](https://doi.org/10.1209/0295-5075/ac7c32)) **SCI IF: 1.958**
- 3) Bhujel, R., Rai, S., Deka, U., Biswas, J., Swain, B.P. *Silicon Nanowires: A Magic Material for Hybrid Solar Cells*. In: Swain, B.P. (eds) *Advances in Nanostructured Materials*. Materials Horizons: From Nature to Nanomaterials. Springer, Singapore. March 2022, pp 21-36 [https://doi.org/10.1007/978-981-16-8391-6\\_2](https://doi.org/10.1007/978-981-16-8391-6_2) (**Book Chapter**)
- 4) “Low Pressure Air Plasma Induced Modification of Structural and Electrical Properties of  $\text{Gd}_{1-x}\text{Sr}_x\text{MnO}_3$  Manganites”, P. Chettri, B. S. Nagaraja, A. Rao and U. Deka Radiat. Eff. Defects in Solids, **176**:11-12, (2021) 1092-1106, doi: 10.1080/10420150.2021.2003364 **SCI IF 1.141**

- 5) “Comprehensive Review on Various Instabilities in Semiconductor Quantum Plasma”, Krishna Sharma, and Utpal Deka, Brazilian J. Phys. Sept 2021 doi.org/10.1007/s13538-021-00991-8 (SCI IF 1.326)
- 6) “Morphological and Electrical characterization of SiNWs synthesized by Electroless Metal Assisted Chemical Etching Method”, Rabina Bhujel, Sadhna Rai, U. Deka, Joydeep Biswas, Bibhu Prasad Swain accepted for publication in Journal of Nano and Electronics Physics Vol. 13 No 2, 02003 (2021). (SCI IF: 0.642) [https://doi.org/10.21272/jnep.13\(2\).02003](https://doi.org/10.21272/jnep.13(2).02003)
- 7) “Bandgap engineering of PEDOT:PSS/rGO a hole transport layer for SiNWs hybrid solar cells. R. Bhujel, S. Rai, J. Biswas, U. Deka, B.Swain, Bull Mater Sci, 44 71 (2021) (SCI IF 1.783) doi.org/10.1007/s12034-021-02376-8
- 8) “Synthesis and characterization of graphene sheet decorated with silver nanoparticles”, R. Bhujel, S. Rai, Z. Mustafa, G. Sarkar, U. Deka, J. Biswas, B.P. Swain, AIP Proc. Adv. Mater. Eng. Technol. 2291 (2020) 040002. doi:10.1063/5.0024234. (SCI IF 0.40)
- 9) Iron Oxide/Reduced Graphene Oxide Composites for the Sensing of Toxic Chemicals, R. Bhujel, S. Rai, U. Deka, J. Biswas, B.P. Swain in the book “Nanostructured Materials and their Applications” Edited by B. P. Swain, Springer, Singapore, 2021 pg 99-113. doi:10.1007/978-981-15-8307-0\_5. (Book Chapter) (Scopus Indexed) ISBN: 978-981-15-8306-3
- 10) Fabrication and Characterization of SiNWs/Polymer Nanocomposite Heterojunction for Photovoltaic Device Applications, Rabina Bhujel, Sadhna Rai, U. Deka, Joydeep Biswas, Gautam Sarkar, Bibhu Prasad Swain. Mater. Today Proc. 39 (2021) 1852-1855. doi:10.1016/j.matpr.2020.07.528. (SCI IF 1.24)
- 11) “Dark and photocurrent response of porous Si/GO-PANI and Si/rGO-PANI heterojunctions for photovoltaics applications”, S. Rai, R. Bhujel, J. Biswas, U. Deka, B.P. Swain, Mater. Today Proc. 39 (2021) 1848-1851. doi:10.1016/j.matpr.2020.07.373. (SCI IF 1.24)
- 12) “Estimation of crystallite size and strain of electron beam irradiated samples of Nd<sub>0.5</sub>Sr<sub>0.5</sub>MnO<sub>3</sub> manganites through XRD analysis” P. Chettri, U. Deka and A. Rao, AIP Conference Proceedings 2273, 050046 (2020); <https://doi.org/10.1063/5.0024304> (Scopus Indexed) IF 0.40
- 13) “Synthesis and characterization of graphene sheet decorated with silver nanoparticles”, Rabina Bhujel, Sadhna Rai, Zeeshan Mustafa, Gautam Sarkar, Utpal Deka, Joydeep Biswas, and Bibhu P. Swain, AIP Conference Proceedings 2273, 040002 (2020); <https://doi.org/10.1063/5.0024234> (Scopus Indexed) IF 0.40
- 14) “Plasma augmented structural and electrical properties of half doped neodymium strontium manganites” P. Chettri, A. Sarma, G. Okram, A. Rao and U. Deka, Phys. Scr. 95 (2020) 115810 (10pp) (SCI IF 2.595)
- 15) “Effect of high energy electron beam irradiation on the structural properties, electrical resistivity and thermopower of La<sub>0.5</sub>Sr<sub>0.5</sub>MnO<sub>3</sub> manganites” Pronita Chettri, Utpal Deka, Ashok Rao, Nagaraja K.K., G.S. Okram, Vikas Chandra Petwal, Vijay Pal Verma, Jishnu Dwivedi Physica B: Condensed Matter 585 412119 (2020). (SCI IF 2.436)
- 16) “Capacitive and Sensing Responses of Biomass Derived Silver Decorated Graphene”, Rabina Bhujel, Sadhna Rai, Utpal Deka, Joydeep Biswas, Bibhu Swain, Sci. Rep. (Nature) 9, 19725 (2019)1–14. doi:10.1038/s41598-019-56178-4. (SCI IF 4.379)
- 17) “Electrochemical, bonding network and electrical properties of reduced graphene oxide-Fe<sub>2</sub>O<sub>3</sub> nanocomposite for supercapacitor electrodes applications”, Rabina Bhujel, Sadhna Rai, Utpal Deka, Bibhu P. Swain, Journal of Alloys and Compounds 792 (2019) 250-259. (SCI IF 5.316)
- 18) Investigation of the effect of electron beam irradiation on the structural and transport properties of half doped Nd<sub>0.5</sub>Sr<sub>0.5</sub>MnO<sub>3</sub> manganites, Pronita Chettri, Utpal Deka, Ashok Rao, G.S. Okram, Vikash Chandra Petwal, Vijay Pal Verma, Jishnu Dwivedi, Riya Thomas, B.S. Nagaraja, Physica B: Condensed Matter 560 220–227 (2019). (SCI IF 2.436)
- 19) “Electrical Properties of Plasma Irradiated Silicon Nanowires for Photovoltaics Applications, Proc.”, R. Bhujel, S. Rai, U. Deka, B.P. Swain, 2018 IEEE Electron Devices Kolkata Conference (EDKCON), 2018, pp. 481-484, doi: 10.1109/EDKCON.2018.8770486 (Web of Science)
- 20) Effects of low pressure plasma irradiation on electrical resistivity of perovskite oxide Eu<sub>1-x</sub>Sr<sub>x</sub>MnO<sub>3</sub>, U. Deka and A. Rao, IOP Conference Series: Materials Science and Engineering 377 012173 (2018); doi:10.1088/1757-899X/377/1/012173 (IF 0.51) (Scopus Indexed)
- 21) “Electrical, thermal and magnetic studies on 7.5MeV electron beam irradiated PrCoO<sub>3</sub> polycrystalline samples”, Benedict Christopher, AshokRao, Utpal Deka, Shyam Prasad K, G.S.Okram, Ganesh Sanjeev, Vikash Chandra Petwal, Vijay Pal Verma, Jishnu Dwivedi, Physica B: Condensed Matter 540 26-32 (2018). (SCI IF 2.436)
- 22) “Quantum Streaming Instabilities in Multi-component Plasma with Dust Particles”, U Deka, K Choudhury, PK Karmakar, Advances in Smart Grid and Renewable Energy, Book Series Chapter : Lecture Notes in Electrical Engineering 645-658, Editors: Prof. Dr. Sabyasachi SenGupta, Dr. Ahmed F. Zobaa, Prof. Dr. Karma Sonam Sherpa, Prof. Akash Kumar Bhoi, Publisher: Springer Singapore, Print ISBN: 978-981-10-4285-0, [https://doi.org/10.1007/978-981-10-4286-7\\_64](https://doi.org/10.1007/978-981-10-4286-7_64) 2018. (Web of Science)
- 23) “Kinetic Instability of the Ion Acoustic Mode in Permeating Plasma of Electron–Positron and Ion”, U Deka, K Shah, Advances in Smart Grid and Renewable Energy, Book Series Chapter: Lecture Notes in Electrical



Engineering 695-707, Editors: Prof. Dr. Sabyasachi SenGupta, Dr. Ahmed F. Zobaa, Prof. Dr. Karma Sonam Sherpa, Prof. Akash Kumar Bhoi, Publisher: Springer Singapore, Print ISBN: 978-981-10-4285-0. [https://doi.org/10.1007/978-981-10-4286-7\\_69](https://doi.org/10.1007/978-981-10-4286-7_69). 2018 (**Web of Science**)

- 24) “*Stochastic and Vibrational Resonances in a Uni-junction Transistor Relaxation Oscillator*”, A. Mahata, M Nurujjaman, U Deka, arXiv preprint arXiv:1704.01002, 2017
- 25) “*Multi-scale dynamics in externally excited glow discharge plasma*”, Utpal Deka, Ashok Rao, and Md. Nurujjaman, Phys. Scr. **90** 125602 (2015). (**SCI IF 2.595**)
- 26) “*High Temperature Superconductors REBa<sub>2</sub>Cu<sub>3</sub>O<sub>7</sub> (RE=Y, Gd and Eu) For Possible Thermo-electric Applications*”, Ashok Rao, Geetha M, Manjunath S.O., Benedict Christopher J, Utpal Deka, Review of Applied Physics (RAP) **4**, 11-16 (2015).
- 27) “*Stability Analysis of the Polytropic Stellar Wind*”, P. K. Karmakar, M. Gohain and U. Deka Canadian Jnl. of Phys. **93** 1-6 (2015) doi:10.1139/cjp-2013-0744. (**SCI IF 1.240**)
- 28) “*Electron Inertia Induce Nonlinear Acoustic Modes Near the Transonic Region in a Multispecies Plasma*”, Utpal Deka, Nayan Kamal Bhattacharyya, Prem Das Chettri, Int. Jnl. of Innovative Res. in Sci., Engg. and Tech., **3**, 12094, (2014).
- 29) “*Modification of Hunsdiecker Reaction using TBATB as the brominating agent*”, Nayan Kamal Bhattacharyya, Poulami Banerjee, Indranirekha Saikia, Biswajit Saha, Subhajit Saha and Utpal Deka, International Journal of Scientific Research (IJSR), **3**, 38-39, (2014).
- 30) “*Copper sulphate as an efficient catalyst for protection of hydroxyl groups using acetyl chloride*”, Nayan Kamal Bhattacharyya, Biswajit Saha, Subhajit Saha, Indranirekha Saikia, Poulami Banerjee, Sangeeta Jha and Utpal Deka ISSN 0974-3111 Volume 6, Number 1 (2014), pp. 47-53. International Journal of Chemistry and Applications.
- 31) “*Modification of Electrical Properties of Metallic Thin Film By Plasma Irradiation*”, Utpal Deka, Nayan Kamal Bhattacharyya, International Journal of Engineering Research & Technology (IJERT), **3**, 752-757, 2014.
- 32) “*A Modified Iterative Method for Finding the Real Roots of a Polynomial*”, U. Deka, R. Prasad and A. N. Kafley, J. of Mod. Meth. in Numer. Math. **3** (2012) 45-52.
- 33) “*Measurement of plasma parameters using digital image processing technique*”, Abhisek Kodal, Soham Majumder and Utpal Deka, In the proceedings of Int. J. Comp. Appl., (Sept 2011) 22-27.
- 34) “*Effect of electron inertial delay on Debye sheath formation*”, U. Deka and C. B. Dwivedi, Brazilian Jnl. of Physics, **40** 3 (2010) 33. (**SCI 1.326**)
- 35) “*Experimental investigation into the effect of Adhesion Properties of High Performance Polymer Modified by Atmospheric Pressure Plasma and Low Pressure Plasma: A comparative Study*” by S. Jha, S. Bhowmik, N. Bhatnagar, N. K. Bhattacharya, U. Deka, H. M. S. Iqbal, R. Benedictus; *J Appl Polym Sci.* **118** (2010) 173. (**SCI IF 2.653**)
- 36) “*Response to “Comment on ‘Graphical analysis of electron inertia induced acoustic instability’” [Phys. Plasmas 13, 104701 (2006)]*” by P. K. Karmakar, U. Deka and C. B. Dwivedi, Phys. Plasmas **13** (2006) 104702. (**SCI IF 2.023**)
- 37) “*Propagation of ion acoustic wave in presheath region of plasma sheath system*” by U. Deka, C. B. Dwivedi and H. Ramachandran Phys. Scr. **73** (2006) 87–97. (**SCI IF 2.595**)
- 38) “*Graphical analysis of electron inertia induced acoustic instability*” P. K. Karmakar, U. Deka and C. B. Dwivedi, Phys of Plasmas **12** (2005) 032105. (**SCI IF 2.023**)
- 39) “*Sheath equivalent circuit model for transient sheath dynamics*” U. Deka, Ram Prakash, A. Sarma and C. B. Dwivedi, Jpn. J. Appl. Phys. **43** (2004) 2704. (**SCI ) IF 1.480**)
- 40) “*Electron inertial delay effect on acoustic soliton behavior in transonic region*”, U. Deka, A. Sarma, Ram Prakash, P. K. Karmakar and C. B. Dwivedi, Phys. Scr. **69** (2004) 303. (**SCI IF 2.595**)
- 41) “*Sheath equivalent electrical model for equilibrium Child sheath description*”, C. B. Dwivedi, U. Deka and A. Sarma, Phys. Scr. **69** (2004) 108. (**SCI IF 2.595**)
- 42) “*Unified Model for Collective Oscillations of An Assymmetric Positive Space Charge Sheath*”, Ram Prakash, A. Sarma, C. B. Dwivedi, U. Deka, B. Singha, S. Bujarbarua and J. C. Upadhyaya, Indian J. Pure & Appl. Phys. **40** (2002) 24. (**SCI IF 0.653**)

#### Papers published in National/ International Conferences:

- 1) “Investigation on low temperature photoluminescence properties of GO-ZnO composite for UV detection application” Sanat Kr. Das, Bibek Chettri, Pronita Chettri, Utpal Deka, Vivekananda Mukherjee, Bikash Sharma, Materials Today: Proceedings, **58**, Part 2, 2022, pp. 758-760, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2022.02.534>., **SCI IF: 1.24**
- 2) “Effect of plasma sheath with secondary electron emission on the TiAN chemical bond formation in titanium dental implantation”, Bivek Pradhan and Utpal Deka, in Materials Today: Proceedings, Volume 58, Part 2, 2022, pp. 656-659, ISSN 2214-7853, <https://doi.org/10.1016/j.matpr.2022.02.082>., **SCI IF: 1.24**

- 3) “*Instabilities in Quantum Semiconductor Plasma: A Review*”, Krishna Sharma and Utpal Deka, accepted for presentation in International Conference on Advances on Plasma Science and Technology, Sri Shakthi Institute of Engineering and Technology, Coimbatore, India (27-29, May 2021)
- 4) “*Morphological and Electrical Characterization of SiNWs Synthesized by Electroless Metal Assisted Chemical Etching Method*” Rabina Bhujel, Sadhna Rai, Utpal Deka, Joydeep Biswas, Bibhu Prasad Swain presented in International Conference on Multifunctional Materials (ICMN2020) December 28-30, 2020 Manipal University Jaipur, Jaipur, Rajasthan, India
- 5) “*Role of plasma sheath in the energy management during plasma surface modification of polymer*” Bivek Pradhan and Utpal Deka, presented in Plasma Colloquium, KIIT, Bhubaneswar, 8, Oct 2020
- 6) “*Electrical Properties of Plasma Irradiated Silicon Nanowires for Photovoltaics Applications*”, Rabina Bhujel, Sadhna Rai, Utpal Deka, Bibhu Prasad Swain, 2018 IEEE Electron Devices Kolkata Conference (EDKCON), Kolkata, India, 2018, pp. 481-484, doi: 10.1109/EDKCON.2018.8770486, IEEE Xplore, July 2019 pg 481-484.
- 7) “*Influence of Plasma Irradiation on the Electrical Resistivity and Structural Parameters of  $\text{Sm}_{1-x}\text{Sr}_x\text{MnO}_3$  manganites ( $0.2 \leq x \leq 0.5$ )*” P. Chettri, A. Rao, B.S. Nagaraja, U. Deka, published for 6<sup>th</sup> PSSI Plasma Scholars Colloquium 24-26 August, 2018.
- 8) “*Molecular Dynamics Simulation of Plasma Interactions With Macromolecules*”, Abhinav Kumar and Utpal Deka, accepted for 6<sup>th</sup> PSSI Plasma Scholars Colloquium 24-26 August, 2018.
- 9) “*Effect of Low Pressure Plasma irradiation on Electrical Properties of Silicon Nanowires for Photovoltaics applications*”, Rabina Bhujel, Ugen Choppel Lepcha, Utpal Deka and Bibhu Prasad Swain, accepted for 6<sup>th</sup> PSSI Plasma Scholars Colloquium 24-26 August, 2018.
- 10) *Study of Electrical Resistivity Behavior of  $\text{Gd}_{1-x}\text{Sr}_x\text{MnO}_3$  due to Low Pressure Plasma Irradiation*, P. Chettri, U. Deka and A. Rao, Manipal Students Research Colloquium, 15-16, March, 2018, SMIT, India.
- 11) “*Effects of low pressure plasma irradiation on electrical resistivity of perovskite oxide  $\text{Eu}_{1-x}\text{Sr}_x\text{MnO}_3$* ”, U. Deka and A.Rao, 1st International Conference on Mechanical, Materials and Renewable Energy (ICMRE-2017) 08th -10th Dec 2017 SMIT, India.
- 12) *Quantum streaming instabilities in multicomponent plasma with dust particle*, U. Deka, K. Choudhury and P.K. Karmakar, 1st Springer International Conference on Emerging Trends and Advances in Electrical Engineering and Renewable Energy (ETAERE-2016) 17-18 December, 2016 SMIT India.
- 13) “*Kinetic instability of the ion acoustic mode in permeating plasma of electron-positron and ion*”, U. Deka, K. Shah, 1st Springer International Conference on Emerging Trends and Advances in Electrical Engineering and Renewable Energy (ETAERE-2016) 17-18 December, 2016 SMIT India.
- 14) “*Low Pressure Plasma Surface Modification Of Surgical Suture For Inhibition Of Bacterial Growth*”, Utpal Deka, First World Conference on Fracture and Damage Mechanics (FRACTURE – 2014) 9- 11 August, 2014 at Mahatma Gandhi University, Kottayam, Kerala, India. (**INVITED TALK**) and also got **3rd PRIZE in POSTER PRESENTATION**.
- 15) “*Time Series Analysis Of Externally Excited Noises In Low Pressure Glow Discharge Plasma*”, Utpal Deka, Ashok Rao, Hemant Sharma, Lha Tshering and Md. Nurujjaman, Oral presentation in *Minamata International Symposium ON Environment And Energy Technology (MISSION 2013)*, 4-6 December, 2013, Kumamoto, Japan.
- 16) *Study of Magnetically Excited nonlinear modes in low-pressure plasmas using nonlinear dynamics techniques: Application to Magnetospheric plasmas*. Utpal Deka, ISRO-RESPOND Conference from, 8-9 Feb 2013 at Physical Research Laboratory, Ahmedabad, India.
- 17) “*Measurement of plasma parameters using digital image processing technique*”, Abhisek Kodal, Soham Majumder and Utpal Deka presented in the International Symposium On Devices MEMS Intelligent Systems and Communication held at SMIT, Sikkim, India from 12<sup>th</sup> – 14<sup>th</sup> April 2011.
- 18) “*Observations of Nonlinear Oscillations in Glow Discharge Air Plasma*”, Rajiv Prasad, Utpal Deka, in the Proceedings of 25<sup>th</sup> National Symposium on Plasma Science & Technology, held from 8<sup>th</sup> -11<sup>th</sup> Dec 2010 at IASST, Guwahati, Assam, India.
- 19) “*Effect of Glow Discharge Plasma on Bacterial Growth on Surgical Suture*”, Yam Prasad, Umesh Dhakal, Dipendra Gurung and Utpal Deka, in the Proceedings of 25<sup>th</sup> National Symposium on Plasma Science & Technology, held from 8<sup>th</sup> -11<sup>th</sup> Dec 2010 at IASST, Guwahati, Assam, India.
- 20) “*Digital Image Processing Technique as a Diagnostic for Atomic Processes in Plasmas*”, Soham Majumdar, Abhishek Kodal and Utpal Deka, in the Proceedings of 25<sup>th</sup> National Symposium on Plasma Science & Technology, held from 8<sup>th</sup> -11<sup>th</sup> Dec 2010 at IASST, Guwahati, Assam, India. (**ORAL**)
- 21) “*Theoretical study of quantum tunneling in plasma immersed substrate and its modification in bonding properties*”, Arjun Pradhan, Rumi Deb Deka and Utpal Deka, in the Proceedings of 2<sup>nd</sup> Indo-Swiss Bonding International Symposium (ISB-2010) held from 11<sup>th</sup> -13<sup>th</sup> Feb 2010 at SMIT, Sikkim, India.
- 22) “*Comparative Studies of Adhesion Properties of High Performance Polymer Modified by Atmospheric Pressure Plasma and Low Pressure Plasma*” H. M. S. Iqbal, M. I. Faraz, N. K. Bhattacharya, U. Deka, S. Jha and S. Bhowmik, published in E. Schindel-Bidinelli (Ed.) Proceedings of Swiss Bonding 2009, pp (1-8). Bulachi (25<sup>th</sup> SWISSBONDING International Congress,) May 11-13, 2009 at Rapperswill, Switzerland.

- 23) “Laser Technology: Its application in biosciences”, U. Deka, Presented as an **invited talk** in National Seminar on Biosciences: Its present trend, held on 10-11<sup>th</sup> Feb, 2006 at Sonapat, Haryana, India.
- 24) “Wave turbulence model approach for equilibrium plasma-sheath description”, U. Deka and C. B. Dwivedi Presented in the 18<sup>th</sup> National Symposium on Plasma Science & Technology, Ranchi, India, 2003 (**Oral**).
- 25) “Effect of finite but weak electron inertia delay on plasma sheath formation”, J. J. Nakarmi, D. S. Air, U. Deka and C. B. Dwivedi, Presented in the 18<sup>th</sup> National Symposium on Plasma Science & Technology, Ranchi, India, 2003.
- 26) “Graphical analysis of electron inertia induced acoustic instability” P. K. Karmakar, U. Deka and C. B. Dwivedi, Presented in the 18<sup>th</sup> National Symposium on Plasma Science & Technology, Ranchi, India, 2003.
- 27) “Futuristic scope of non-intrusive diagnostics for basic and applied research in plasma sheath experiments”, A. Sarma, Ram Prakash, U. Deka, and C. B. Dwivedi, Presented in 18<sup>th</sup> the National Symposium on Plasma Science & Technology, Ranchi, India, 2003.
- 28) “Development of double plasma device for basic investigation of sheath physics”, Ram Prakash, A. Sarma, R. K. Das, B. K. Saikia, U. Deka, S. Bujarbarua and C. B. Dwivedi, Presented in the 16<sup>th</sup> National Symposium on Plasma Science & Technology, Guwahati, India, 2001.
- 29) “An analytical Model for Time Varying Plasma Immersion Ion Implantation Current”, U. Deka, Ram Prakash, A. Sarma and C. B. Dwivedi, Presented in 16<sup>th</sup> the National Symposium on Plasma Science & Technology, Guwahati, India, 2001.
- 30) “Propagation of ion-acoustic waves in a collisional presheath”, U. Deka, C. B. Dwivedi and H. Ramachandran, Presented in the 16<sup>th</sup> National Symposium on Plasma Science & Technology, CPP, Guwahati, India, 2001 (**Oral**).
- 31) “Electron inertial delay effect on acoustic soliton behavior in transonic region”, U. Deka, Ram Prakash and C. B. Dwivedi, Presented in the 16<sup>th</sup> National Symposium on Plasma Science & Technology, CPP, Guwahati, India, 2001.
- 32) “Propagation of ion acoustic wave in a presheath” U. Deka, C. B. Dwivedi and H. Ramachandran, Presented in the 15<sup>th</sup> National Symposium on Plasma Science & Technology, SINP, Kolkata, India, 2000.
- 33) “Diode-like Circuit Model for Positive Ion-rich Plasma SheathI”, Ram Prakash, A. Saram, C. B. Dwivedi and U. Deka Presented in the 15<sup>th</sup> National Symposium on Plasma Science & Technology, SINP, Kolkata, India, 2000.
- 34) “Comprehensible physical model for the positive space region”, A. Sarma, C. B. Dwivedi, Ram Prakash, U. Deka and B. Singha, Presented in the 14<sup>th</sup> National Symposium on Plasma Science & Technology, GNDU, Amritsar, India, 1999.
- 35) “Nonlinear normal mode behavior of a modified-ion acoustic Wave”, Ram Prakash, C. B. Dwivedi, A. Sarma and U. Deka, Presented in the 14<sup>th</sup> National Symposium on Plasma Science & Technology, GNDU, Amritsar, India, 1999.

#### Popular Articles/Talks:

- 1) Presented a lecture series on “Methodology of Teaching Sound to High School Students” as a resource person in “Sikkim School Teacher’s Training Program”, organized by Ministry of HRD Govt. of Sikkim & Ministry of HRD Govt. of India from 14<sup>th</sup> Dec. 2010-13<sup>th</sup> Jan. 2011 at SMIT, Sikkim.
- 2) Presented a lecture on “Basics of Laser and Its Application” as a resource person in a workshop on “Science for School Children” organized by Jagdish Bose National Science Talent Search at SMIT, on 28<sup>th</sup> July 2007.
- 3) Presented a lecture on “Physics at Nano Scale: Science and Its Application” as a resource person in a science workshop on “Frontline Research in Physics” organized by Jagdish Bose National Science Talent Search for school students at P.N. Girls High School, Gangtok on 22<sup>nd</sup> Feb 2007.
- 4) Presented Popular Talk on National Science Day commemorating the occasion of Year of the Physics, 2005.
- 5) P. K. Karmakar, U. Deka and C. B. Dwivedi, “A newly discovered cause of destabilizing the flowing plasma against acoustic wave fluctuations”, Plasma India, A newsletter of Plasma Science Society of India, Vol. 19 No. 1 (2004).

#### Organization of Seminars/ Workshop/ Conferences:

- 1) Organizing Coordinator of AICTE sponsored 2 weeks ATAL-FDP on “Quantum Computing and Quantum Information Technology: New Vertical in computing” from 21 Nov-2 Dec, 2022.
- 2) Organizing Chairman of Three Day International Conference on “International Conference on Physics of Materials and Technology” from 16-18 Feb, 2022.
- 3) Organizing Secretary of One Day International Webinar on “Recent Advances in Physics and Its Applications” in October 2020
- 4) Joint Convener of three day NESAC-ISRO sponsored workshop “Space on Wheels” for School and College students in 5-7 March 2020, SMIT.
- 5) Convener, 6<sup>th</sup> PSSI Plasma Scholars Colloquium 24-26 August, 2018, SMIT, Sikkim.
- 6) Member of the organizing committee of the one-day workshop on “Emerging Technologies of 21st Century and Man Making Nation Building” held on 1<sup>st</sup> Nov. 2010 at SMIT, Sikkim.



- 7) Member of the Core Committee in organizing a Three Day International Conference “INDOSWISS BONDING 2010” on adhesion bonding and applied nanotechnology held from 11<sup>th</sup> Feb – 13<sup>th</sup> Feb 2010 in SMIT, Majitar, Sikkim.
- 8) Member of the Core Committee in organizing a Three Day Workshop on “PAC Meeting” for evaluation of projects held in SMIT in collaboration with DST, Govt. of India in the month of May 2008.
- 9) Member of the Core Committee in organizing a Two Day Workshop on “Science for School Children” on 27<sup>th</sup> and 28<sup>th</sup> July 2007 at SMIT in collaboration with JBNSTC, Kolkata.
- 10) Member of the Core Committee in organizing a One Day “Science Workshop by Eminent Scientist” for School Children of North East on 24<sup>th</sup> June 2007 at SMIT in collaboration with S. N. Bose Institute, Kolkata.
- 11) Member of the Core Committee in organizing a Three Day Workshop on “Young Scientist Meet for Fast Track Proposals” for the Young Scientist March 2007 at SMIT in collaboration with DST, Govt. of India.
- 12) Member of the Core Committee in organizing “Children’s Science Congress” on Dec 2006 at SMIT in collaboration with DST Govt. of Sikkim and DST Govt. of India.
- 13) Member of the Core Committee in organizing a Two Day National Seminar on “The Impact of Condensed Matter Physics on Technology” on 4<sup>th</sup> and 5<sup>th</sup> July 2005 at SMIT.

**Other Academic Activities:**

Invited as PhD Thesis Examiner at Vellore Institute of Technology, Chennai, External Examiner for Research based MSc Thesis for IIT Madras, External Examiner, Paper setter for Sikkim Central University, Sikkim.

**Members of societies:**

Life member of Plasma Science Society of India (LM-405); Life member of Indian Chapter of the International Centre for Theoretical Physics (Indian Chapter of ICTP) (ICICTP/99/305); Life member of Indian Science Congress Association (No. 8476); Life member of Assam Academy of Mathematics (No. 2140)

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(Utpal Deka)