

# Dr. Arijit Roy

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e-mail : arijitroy@live.com  
ORCID : <https://orcid.org/0000-0002-9618-6641>  
Google Scholar : <https://scholar.google.com/citations?user=dTNmyxQAAAAJ&hl=en>  
Research Gate : [https://www.researchgate.net/profile/Arijit\\_Roy9](https://www.researchgate.net/profile/Arijit_Roy9)  
Academia Edu : <https://wbsubregistration.academia.edu/DrArijitRoy>



Date of Joining: 2<sup>nd</sup> April 2009  
Present Designation: Assistant Professor (Stage – III)  
Previous Experience: (i) Engineer, Infineon Technologies, Singapore – 2 Years  
(ii) Research Associate, NTU, Singapore – 2 Years

Qualifications: (i) Ph.D. from NTU, Singapore  
(ii) M.Tech. (Instru. Tech.) from IIT-Delhi  
(iii) M.Sc. (Physics) from IIT-Kharagpur  
(iv) B.Sc. (Physics Hons.) from Balurghat College (under NBU)

**Ph.D. Guidance:**

1. Dr. Dibyendu Chatterjee (Assistant Prof., Physics, Distance Education, Vidyasagar University), Thesis: A Study on Transmon-based Quantum Computing Schemes, Completed.
2. Ms. Aparna Adhikari (DST-Inspire), Electromigration Reliability of Cu interconnect, Ongoing.
3. Ms. Priyanka Guin (DST-Inspire), Instrumentation and Measurement, Ongoing.
4. Mr. Abhishek Mallick (DST-Inspire), Energy Harvesting Circuits, Ongoing.
5. Mr. Pranay Biswas (Assistant Prof., Dinabandhu Mahavidyalaya), Bioimpedance, Ongoing.

**M.Sc. Project Guidance:** Students of the department work throughout the year in the diverse area of electronics, including (but not limited to):

1. Bioelectronics
2. Analog Circuits and Systems, Digital Circuit Optimization
3. Precision Instrumentation, Measurements, Sensors, Arduino-based Circuits
4. Fractional Order Circuits, Fabrication of non-ideal components for fractional order circuit
5. Development of “Artificial Intelligence”, “Machine Learning” – based algorithm for application in biomedical science
6. Nanomaterials, Microelectronic Reliability, Reversible Logic Gates, Quantum Computing

**Research Publications:** Visit Google Scholar or Research Gate for publication details and Citation Report.

Below is the list of **Best 20 Research Papers, Average Impact-Factor/Paper = 3.711**

| Cumulative Number | Impact Factor | Year | Paper Details   |
|-------------------|---------------|------|---|
| 20                | 1.898         | 2021 | Soumyajit Podder, Somnath Bhattacharjee, <b>Arijit Roy</b> .<br>“An efficient method of detection of COVID-19 using Mask R-CNN on chest X-Ray images”.<br>AIMS Biophysics, 8(3): 281–290, 2021.<br>DOI: 10.3934/biophy.2021022.   |
| 19                | 1.898         | 2020 | <b>Arijit Roy</b> , Somnath Bhattacharjee, Soumyajit Podder, Advaita Ghosh.<br>“Measurement of bioimpedance and application of Cole model to study the effect of moisturizing cream on human skin”.<br>AIMS Biophysics, 7(4): 362–379, 2020.<br>DOI: 10.3934/biophy.2020025 |

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|----|------------------------|------|---|
| 18 | 1.898                  | 2020 | <b>Arijit Roy</b> , Abhishek Mallick, Surajit Das, Abhijit Aich.<br>“An experimental method of bioimpedance measurement and analysis for discriminating tissues of fruit or vegetable”.<br>AIMS Biophysics, vol. 7(1), pp. 41 – 53.<br>DOI: 10.3934/biophy.2020004.                           |
| 17 | 1.901                  | 2018 | Aparna Adhikari, <b>Arijit Roy</b> .<br>“Experimenting and modelling of catastrophic failure in electromigration induced resistance degradation for deep submicron dual damascene copper interconnects”.<br>Solid State Electronics, vol. 148, pp. 7 – 15.<br>DOI: 10.1016/j.sse.2018.07.002. |
| 16 | 2.038                  | 2017 | Dibyendu Chatterjee, <b>Arijit Roy</b> .<br>“Multiple data access via a common cavity bus in circuit QED”.<br>Int. J. Cric. Theor. Appl., vol. 2015.<br>DOI: 10.1002/cta.2331.  |
| 15 | <a href="#">10.367</a> | 2016 | <b>Arijit Roy</b> , Aparna Adkhikari.<br>“Microstructure measurement techniques for studying electromigration in ULSI interconnects”.<br>Critical Reviews in Solid State and Materials Sciences, vol. 41(3), pp. <b>159 – 191</b> .<br>DOI: 10.1080/10408436.2015.1135414.                    |
| 14 | 1.548                  | 2016 | Priyanka Guin, <b>Arijit Roy</b> .<br>Design of efficient loadcell for measurement of mechanical impact by piezoelectric PVDF film sensor”.<br>AIP Advances, vol. 6, pp. 095122.<br>DOI: 10.1063/1.4964148.   |
| 13 | 2.572                  | 2015 | Dibyendu Chatterjee, <b>Arijit Roy</b><br>“A transmon-based quantum half-adder scheme”.<br>Prog. Theor. Exp. Phys., vol. 2015, pp. 093A02 (16 pages).<br>DOI: 10.1093/ptep/ptv122.  |
| 12 | 2.532                  | 2014 | <b>Arijit Roy</b><br>“Fabrication and characterization of copper interconnects of line-width down to 100 nm using a specially designed phase shift mask”.<br>Microelectronic Engineering, vol. 113, pp. 152–156,<br>DOI: 10.1016/j.mee.2013.08.014.   |
| 11 | 1.589                  | 2009 | <b>Arijit Roy</b> , Yuejin Hou, Cher Ming Tan.<br>“Electromigration in width transition copper interconnect”.<br>Microelectronics Reliability, vol. 49, pp. 1086–1089.<br>DOI:10.1016/j.microrel.2009.06.038.   |
| 10 | 2.546                  | 2008 | <b>Arijit Roy</b> , Cher Ming Tan.<br>“Very high current density package level electromigration test for copper interconnects”.<br>J. Appl. Phys., vol. 103, pp. 093707.<br>DOI: 10.1063/1.2917065.   |
| 09 | 2.183                  | 2007 | <b>Arijit Roy</b> , Cher Ming Tan.<br>“Probing inot the asymmetric nature of electromigration performance of submicron interconnect via structure”.<br>Thin Solid Films, vol. 515, pp. 3867–3874.<br>DOI: 10.1016/j.tsf.2006.10.124.  |
| 08 | 1.589                  | 2007 | <b>Arijit Roy</b> , Cher Ming Tan, Sean J. O’Shea, Kedar Hippalgaonkar, Wulf Hofbauer.<br>“Room temperature observation of point defect on gold surface using thermovoltage mapping”.<br>Microelectronics Reliability, vol. 47, pp. 1580–1584.<br>DOI:10.1016/j.microrel.2007.07.010.         |

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|----|------------------------|------|---|
| 07 | <a href="#">26.620</a> | 2007 | Cher Ming Tan, <b>Arijit Roy</b> .<br>“Electromigration in ULSI interconnects”.<br>Materials Science and Engineering R, vol. 58, pp. 1–75.<br>DOI:10.1016/j.mser.2007.04.002.   |
| 06 | 2.546                  | 2007 | Cher Ming Tan, Nagarajan Raghavan, <b>Arijit Roy</b> .<br>“Application of gamma distribution in electromigration for submicron interconnects”.<br>J. Appl. Phys., vol. 102, pp. 103703.<br>DOI: 10.1063/1.2809449.  |
| 05 | 2.183                  | 2006 | Cher Ming Tan, <b>Arijit Roy</b> .<br>“Investigation of the effect of temperature and stress gradients on accelerated EM test for Cu narrow interconnects”.<br>Thin Solid Films, vol. 504, pp. 288–293.<br>DOI:10.1016/j.tsf.2005.09.101.   |
| 04 | 2.654                  | 2006 | <b>Arijit Roy</b> , Rakesh Kumar, Cher Ming Tan,<br>Terence K S Wong, C-H Tung.<br>“Electromigration in damascene copper interconnects of line width down to 100 nm”.<br>Semicond. Sci. Technol., vol. 21, pp. 1369–1372.<br>DOI:10.1088/0268-1242/21/9/02.   |
| 03 | 1.589                  | 2006 | <b>Arijit Roy</b> , Cher Ming Tan.<br>“Experimental investigation on the impact of stress free temperature on the electromigration performance of copper dual damascene submicron interconnect”.<br>Microelectronics Reliability, vol. 46, pp. 1652–1656.<br>DOI:10.1016/j.microrel.2006.07.036.                  |
| 02 | 1.990                  | 2005 | Cher Ming Tan, <b>Arijit Roy</b> , A. V. Vairagar, Ahila Krishnamoorthy, Subodh G. Mhaisalkar.<br>“Current Crowding Effect on Copper Dual Damascene Via Bottom Failure for ULSI Applications”<br>IEEE Transactions on Device and Materials Reliability, vol. 5(2), pp. 198–204.<br>DOI: 10.1109/TDMR.2005.846830. |
| 01 | 2.084                  | 2003 | <b>Arijit Roy</b> , Preeta Sharan, H.N. Acharya<br>“Optimal design of broadband long period grating-based LP <sub>01</sub> ↔LP <sub>02</sub> mode converters for dispersion compensation”.<br>Optical and Quantum Electronics, vol. 35, pp. 651–661.  |

**Invited Speaker:** 6 Invited Lectures. Here is the list.

1. Demonstration of an efficient wireless method of conducting MCQ test, Teachers' Enrichment Workshop, Bhairab Ganguly College, Kolkata, 30<sup>th</sup> Aug. 2019.
2. The golden threads of conducting research, Resource Person, UGC CPE funded Teacher Enrichment Workshop, Barrackpore Rastraguru Surendranath College, West Bengal, 26<sup>th</sup> Feb. 2019.
3. Technology and Disability: Developing an electronic stick for visually impaired people, UGC Sponsored Conference on Persons with Special Needs and Rehabilitation Management, Jadavpur University, Kolkata, 2018.
4. Global communication and the role of electronics in agriculture & rural development, Resource Person at ICAR Sponsored Summer School, BCKV, West Bengal, 19<sup>th</sup> Sept. 2016.
5. Beyond the limits of traditional photolithography in IC manufacturing: Design and application of special alternating phase shift mask, Invited Speaker at National Conference on Applied Electronics, Kolkata, 26<sup>th</sup> Oct. 2013.
6. Recent developments in IC Manufacturing Technologies, Plenary Lecture at IEEE Int. Conf. ICCIA, Kolkata, 27<sup>th</sup> Dec. 2011.

**Synergetic Activities:**

1. Acted as reviewer for reputed international journals.
2. Acted as subject experts for Govt. and Private Institutes.
3. Acted as HOD, Department of Electronics, WBSU.



The collage features a variety of scientific content:

- Equations:** A prominent equation for  $|Z|$  is shown in the top left: 
$$|Z| = \sqrt{\left[ R_{\infty} + \frac{(R_0 - R_{\infty})(1 + \omega^2 \tau^2 \cos^2 \frac{\alpha}{2})}{(1 + \omega^2 \tau^2 \sin^2 \frac{\alpha}{2})} \right]^2 + \left[ \frac{(R_0 - R_{\infty})(\omega \tau \sin \frac{\alpha}{2})}{(1 + \omega^2 \tau^2 \sin^2 \frac{\alpha}{2})} \right]^2}$$
- Diagrams:** Includes circuit diagrams for an energy harvester, a Toffoli CNOT gate, and various sensor and control systems.
- Graphs:** Numerous plots showing frequency response, intensity, and other physical parameters.
- Photographs:** Shows physical components like a microchip, a sensor, and a breadboard circuit.
- Material Structures:** 3D models and diagrams of layered materials, nanowires, and quantum devices.
- Chemical/Physical Models:** Molecular models and diagrams of quantum states (State 0 to State II).

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