Curriculum vitae

RAHUL
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CARRIER OBJECTIVES

- Proactive in seeking out opportunities and gaining experience in a research academic career in f nanoscience, material science, energy storage, devices; and professional experience under the observation of a supervisor.
- Expand on existing research ideas to pursue new lines of research in the different fields of application for societal implications.

EDUCATION

Ph.D.	Jamia Millia Islamia, New Delhi, India Thesis title: ***"Investigations on Dye-Sensitized Solar Cells"*** *Awarded on 11th December 2018*	25/10/2013-11/122018
M.Phil.	Bundelkhand University, Jhansi, U.P. India *Subject: Physics*	01/07/2010-30/06/2011
M.Sc.	Dr Bhimrao Ambedkar University, Agra, U.P. India, *Subject: Physics*	01/07/2005-30/06/2007
B.Sc.	Chhatrapati Shahu Ji Maharaj University, Kanpur, U.P. India *Subject: Physics, Chemistry& Mathematics*	01/07/2001-30/06/2004
B.Ed.	Jamia Millia Islamia, New Delhi, India	01/07/2008-30/06/2010

RESEARCH INTERESTS

- Nanomaterials for Device Applications
- Polymer Nanocomposites
- Thin Film Fabrication
- Dye-Sensitized Solar Cells/Perovskite Sensitized Solar Cells
- Organic Solar Cell
- Solid polymer Electrolyte & application in Supercapacitors

N. B: I am flexible in new areas depending on the opportunity in the field of Nanoscience, Energy Storage, Material Science, and photovoltaics.

PROFESSIONAL EXPERIENCES

Oct 2021- Sept 2022	**Postdoctoral Fellow,** Dept of Electrical & Computer Engineering, Ben-Gurion University of the Negev, Israel
Nov 2018-Sep 2021	**Lecturer,** Dept of Physics, D.B.R.A. University. Agra, India
Sept 2013 -Dec2018	**Research Fellow,** Dept of Applied Sciences, Jamia Millia Islamia, New Delhi, India

July 2011-June 2013	**Lecturer,** Dept of Physics, D.B.R.A. University. Agra, India
July 2010 -June 2011	**Research Fellow,** Dept of Physics, Bundelkhand University, Jhansi, U.P. India

RESEARCH SKILLS

Physical Techniques	**Chemical Techniques**	**Data analysis**
Screen Printing, CVD, Thermal Evaporation, Spin Coating, Dip Coating, Spray Coating	Hydrothermal, Co-precipitation, Electrodeposition, Doctor blading, Crystallization of perovskite	TEM, UV, XRD, SEM, EDAX, IV Characteristics, AFM, XPS, and TGA techniques, Ellipsometry

Equipment Handling	Computer skills
Spin Coater, Programmable furnaces, UV-Visible spectrophotometer, Fourier transform infrared spectroscopy, Screen Printer, Monochromator, Programmable vacuum oven, Polarized Optical Microscope, Ellipsometer	Platforms: Windows Applications: Microsoft office tools, Origin, ImageJ, Chem-Draw, EndNote etc.

PUBLICATIONS

Google Scholar Citations: 438; h-index: 13; i10-index: 15

Google Scholar Id- https://scholar.google.com/citations?user=tGan2WcAAAAJ&hl=en

PEER-REVIEWED SCIENTIFIC JOURNALS

1. **Rahul Johari,** Rakesh K. Sonker, Victor Okai, Zishan H. Khan, Optoelectronic study of polymer electrolyte incorporated perovskite sensitized solar cell, **Macromolecular symposia Vol.407 Issue.1(2023).**
   Description- *The present study focuses on the optical and electronic study of $CH_3NH_3PbBr_3$ and $CH_3CH_2NH_3PbI_3$ perovskite fabricated by a one-step solution-based self-assemblage method.*
2. Rahul, Rakesh K Sonker, Chandra Shakher Pathak, Victor OKai, MZA Yahya, Abhimanyu Singh, Zishan H Khan, **Journal of Electronic Materials (Communicated)**
   Description- *A comparison of CH_3NHPbI_3 and $CH_3NH_3SnCl_3$ perovskite sensitizers is discussed in depth in terms of structural, optical, and electrical properties.*
3. Rakesh K. Sonker, Raj Kamal Shastri, **Rahul Johari,** Superficial Synthesis of CdS Quantum Dots for an Efficient Perovskite-Sensitized Solar Cell, **Energy & Fuels (2021). Citations-5.**
   Description-*In this paper, a thorough investigation of CdS nanoparticle characteristics has been studied because of the wide attention and enormous application in a solar cell. Perovskite solar cells are a favorably effectual and sanitary hybrid, organic–inorganic solar cell device.*
4. Rakesh K. Sonker, Gaurav Hitkari, S.R. Sabhajeet, S. Sikarwar, **Rahul,** Sandhya Singh, Green synthesis of TiO_2 nanosheet by chemical method for the removal of Rhodamine B from industrial waste, **Materials Science & Engineering B Vol. 258 (2020)114577. Citations-19.**
   Description-*This paper deals with green synthesis of TiO_2 nanosheet by chemical method for the removal of Rhodamine B from industrial waste.*

5. **Rahul**, Shruti Singh, Pramod K. Singh, Sunanda Kakroo, Dhafer Manea Hachim, Pawan S, Dhapola, Zishan H. Khan, Eco-friendly dye-sensitized solar cell using natural dye with solid polymer electrolyte as hole transport material, **Materials Today: Proceedings (2020)** **Citations-11.**
   Description- *In the existing research work dye-sensitized solar cells were fabricated using natural dye extracted from some fruits as 'sensitizer'.*
6. **Rahul**, Shruti Singh, Pramod K. Singh, Jitender Paul Sharma, Sunanda Kakroo, Rakesh Sonker, Z. H. Khan, Encompassing environment Synthesis, characterization, and photovoltaic utilization of Cadmium Sulphide quantum dots, **Materials Today: Proceedings (2020)** **Citations-3.**
   Description- *In this paper, very low cost and efficient CdS-QD has been synthesized using chemical bath method. The prepared CdS QDs are characterized by UV–Vis absorption, photoluminescence (PL), XRD. A QDSSC will be proposed using a synthesized CdS.*
7. Himani Ahuja, Pawan Singh Dhapola, **Rahul,** Nanda Gopal Sahoo, Vijay Singh and Pramod K Singh, Ionic liquid (1-hexyl-3-methylimidazolium iodide)-incorporated biopolymer electrolyte for efficient supercapacitor, **High-Performance Polymers Vol. 32(2) (2020)220–225.** **Citations-11.**
   Description- *An efficient EDLC has been fabricated using carbon-based electrodes and maximum conducting biopolymer electrolyte which shows promising result.*
8. Mohd Zaid Ansari, Mohd Wahid, **Rahul Johari**, Mohammad Amir Qureshi and Weqar Ahmad Siddiqi, Novel honey mediated green synthesis of Graphene@AgNanocomposite and its two-dimensional application in photovoltaic & anti-microbial activity, **Material Research Express 6(2019)115071.** **Citations-3.**
   Description-*The green and facile method were successfully employed for the fabrication of Graphene/Ag nanocomposite (Gr@AgNCs) with graphite oxide as precursor and $AgNO_3$ as precursor for Ag nanoparticles.*
9. Mohd Zaid Ansari, **Rahul Johari,** and Weqar Ahmad Siddiqi, Novel and green synthesis of chemically reduced graphene sheets using Phyllanthus Emblica (Indian Gooseberry) and its photovoltaic activity, **Material Research Express 6(2019)055601.** **Citations-20.**
   Description-*The study presents a novel and environment friendly procedure for obtaining chemically reduced graphene sheets (CRGs).*
10. Ahsan Ahmed, Sultan Ahmed, **Rahul**, M. Parvaz, M. Rafat, Dual-energy application of NiO: Electrochemical and photovoltaic properties, International **OPTIK, 179(2019)485-491.** **Citations-10.**
    Description-*In the present work, we report the synthesis of Nickel oxide (NiO) nanoparticles employing hydrothermal technique. Pore size and surface area analysis reveal the porosity in the synthesized sample and indicates its suitability use for electrochemical and photovoltaic devices.*
11. **Rahul**, Pramod K Singh, Rahul Singh, B. Bhattacharya, Zishan H. Khan, New class of lead-free perovskite material for low-cost solar cell application, MRB**, 97(2018)572-577.** **Citations-45.**
    Description-*In this paper, we fabricate a new class of perovskite sensitizer material for photovoltaic application. This is not only low-cost perovskite material but also is a non-toxic material for solar cell as compared to the conventional materials used in PSC.*
12. **Rahul,** Pramod K Singh, M. Parvaz, Sultan Ahmed, Rakesh Sonker, Bhaskar Bhattacharya, Zishan H Khan, Less toxic Tin Incorporated Perovskite Solar Cell using Polymer Electrolyte processed in the air, **OPTIK, 169(2018)166-171.** **Citations-13.**
    Description-*This paper deals the fabrication, characterization as well as application of perovskite material. $MASnCl_3$($CH_3NH_3SnCl_3$) was composed by coordinate statement of equimolar convergence of CH_3NH_3Cl and tin $SnCl_2$ in DMF arrangement.*
13. **Rahul,** Pramod K Singh, B. Bhattacharya. & Z.H. Khan, Environment approachable dye-sensitized solar cell using abundant natural pigment-based dyes with solid polymer electrolyte, **Optik165(2018)186-194.** **Citations-15.**
    Description-*In the present work dye sensitized solar cells were fabricated using natural pigment-based dye extracted from different fruits as 'sensitizer'. The photovoltaic properties of FTO coated thin film and extracted natural dyes were studied using UV–vis-NIR spectroscope.*

14. Rakesh K. Sonker, **Rahul,** S. R. Sabhajeet, ZnO nanoneedle structure-based Dye-Sensitized Solar Cell utilizing solid polymer electrolyte, **Materials Letters 223 (2018) 133–136. Citations-24.**
Description- *It exhibits a unique combination of potentially interesting properties such as high bulk electron mobility and probably the richest variety of nanostructures based on a very wide range of synthesis routes.*
15. Rakesh K. Sonker, **Rahul,** S.R. Sabhajeet, Samiksha Sikarwar, Spherical Growth of nanostructured ZnO based optical sensing and Photovoltaic Application, **Optical Materials 83 (2018) 342-347. Citations-24.**
Description-*The present paper reports deviation in the intensity of light transmitted through the film of ZnO spherical nanostructure with the exposure of humidity at room temperature. For this purpose, the ZnO SNSs was prepared and used for coating thin film on borosilicate substrates.*
16. Sultan Ahmed, M Parvaz, **Rahul,** Mohd Rafat, Studies on activated carbon derived from neem (Azadirachta indica) bio-waste, and its application as a supercapacitor electrode, **Material Research Express,5(2018)045601. Citations-43.**
Description-*The present study reports the preparation of a quasi-solid-state supercapacitor employing activated carbon (AC) electrodes and gel polymer electrolyte (GPE). AC was derived from Neem leaves by means of chemical activation using zinc chloride as activating agent.*
17. **Rahul**, Pramod K. Singh, Rahul Singh, Vijay Singh, S. K. Tomar, B. Bhattacharya and Zishan H. Khan,, Effect of crystal and powder of CH_3NH_3I on the $CH_3NH_3PbI_3$based Perovskite sensitized solar cell, **Materials Research Bulletin 89(2017)292-296**. **Citations-25.**
18. Rahul Singh, B. Bhattacharya, Meenal Gupta, **Rahul**, Zishan H. Khan, S.K. Tomar, Vijay Singh, Pramod K. Singh, Electrical and structural properties of ionic liquid doped polymer gel electrolyte for dual-energy storage devices, **IJHE, 42(2017)14602-14607. Citations-31.**
Description-*This paper reports the synthesis, characterization, and dual electrochemical application of a new kind of ionic liquid-based polymer electrolyte. The ionic liquid) and polymer PVDF-HFP have been chosen for present study.*
19. **Rahul,** Pramod K. Singh, Rahul Singh, B. Bhattacharya, and Z. H. Khan, Natural and environment favorable Dye Used as Light Sensitizer in Dye-Sensitized Solar Cell: A Critical Review, **JMSSE,5 (8) (2017) 722-728. Citations-5.**
Description-*Among all the natural sun-based cells, colour-sharpened sun-based cells (DSSCs) are the most effective and effortlessly executed innovation. Here, this examination looks at the working rule, and shows improvement and prospects for this novel innovation.*
20. **Rahul**, Pramod K Singh, B. Bhattacharya, Z. H. Khan, Comparative photovoltaic study of lead and tin-based perovskite sensitized solar cell using polymer electrolyte, **IJEM 5(2017)13-18. Citations-2.**
Description-*This paper comprises characterization as well as application of perovskite material. Perovskite light sensitizer material $CH_3NH_3PbI_3$ was synthesized by direct deposition of equimolar concentration of CH_3NH_3I and PbI_2 in DMF solution and characterized using experimental tools.*
21. Rakesh K. Sonker, S. R. Sabhajeet, B.C. Yadav, **Rahul,** LPG detection using SnO_2, PANI-SnO_2 and Ag-SnO_2 composite film fabricated by Chemical Route, **IJEM 5 (2017) 6-12. Citations-4.**
Description- *In the present work, a chemical route was used to deposit PANI and Ag-doped SnO2 thin films. After careful study, SnO2 thin films with suitable growth conditions were selected for probing their response toward LPG.*
22. **Rahul**, B. Bhattacharya, Pramod K. Singh, Roja Singh, Zishan H. Khan, Perovskite sensitized solar cell using solid polymer electrolyte, **IJHE, 41(2016)2847-2852. Citations-34.**
Description-*A perovskite sensitized solar cell (PSSC) comprising ethyl ammonium tri-lead iodide ($CH_3CH_2NH_3PbI_3$) and solid polymer electrolyte have been successfully fabricated in this paper.*
23. **Rahul**, B. Bhattacharya Pramod K. Singh, Stable Perovskite Sensitized Solar Cell Using PEO Based Polymer Electrolyte in Ambient Environment Condition, **Current Nanomaterials 1(3)(2016)171-175. Citations-4**
Description-*This paper describes the synthesis of Perovskite material and fabrication of Perovskite sensitized solar cells making use of chemical route and doctor blading. Various properties like structural, morphological, and photovoltaic.*

24. Archit Tomar and **Rahul,** A Review on Hybrid Vehicles, Emissions Comparison with Conventional Vehicle and Policies Adoption for Promotion, **IJRET,3 (2015)12-20, ISSN(E): 2321-8843; ISSN(P): 2347-4599.**
Description*-This paper review the main accepts of hybrid vehicles.* **Citations-2.**

CONFERENCE PROCEEDINGS

1. National Conference on Nanotechnology and Renewable Energy **"NCNRE- 2014" 28-29 April 2014, JMI New Delhi (INDIA)**entitled the presentation **"A Review on Counter Electrode Materials for TiO_2 Film in Dye-Sensitized Solar Cells"** (ISBN-978-93-81212-65-3).
2. National Conference on Nanotechnology and Renewable Energy **"NCNRE- 2014" 28-29 April 2014, JMI (INDIA)**entitled the presentation **"PVP-KI Polymer Electrolyte for DYE Sensitized Solar Cell"** (ISBN-978-93-81212-65-3).
3. National Conference on Nanotechnology and Renewable Energy **"NCNRE- 2014" 28-29 April 2014, JMI New Delhi (INDIA)**entitled the presentation **"Different Solar Cell Technologies: A Review**" (ISBN-978-93-81212-65-3).
4. National Conference on Nanotechnology and Renewable Energy **"NCNRE- 2014" 28-29 April 2014, JMI New Delhi (INDIA)**entitled the presentation **"Nanotechnology: An Emerging Technology for Environmental Remediation"** (ISBN-978-93-81212-65-3).
5. National Conference on Nanotechnology and Renewable Energy **"NCNRE- 2014" 28- 29 April 2014, JMI New Delhi (INDIA)**entitled the presentation **"Dye-Sensitized Solar Cell based on TiO_2 Thin Film: A Review"** (ISBN-978-93-81212-65-3).
6. 2nd International Conference on Condensed Matter and Applied Physics **"ICC-2017" 24-25 November 2017, Govt. Engineering College, Bikaner-334004, Rajasthan (INDIA)** entitled to the presentation **"Synthesis of TiS_2 Nano discs for Supercapacitor Application"** in **AIP conference proceedings (SCI).**
7. 2nd International Conference on Condensed Matter and Applied Physics **"ICC-2017" 24-25 November 2017, Govt. Engineering College, Bikaner-334004, Rajasthan (INDIA)** entitled of the presentation **"Hydrothermal Synthesis of Poly (3,4-ethylene dioxythiophene) for high-rate Performance Supercapacitor" in AIP conference proceedings (SCI).**
8. 2nd International Conference on Condensed Matter and Applied Physics **"ICC-2017" 24-25 November 2017, Govt. Engineering College, Bikaner-334004, Rajasthan (INDIA)** entitled to the presentation **"Synthesis and Characterization of Au incorporated Alq3 Nanowires** "in **AIP (American Institute of Physics) conference proceedings (SCI).**
9. **2018 International Conference on Power Energy, Environment, and Intelligent Control (PEEIC)** G.L. Bajaj Engineering Institute, Greater Noida, India entitled to the presentation **"Polymer Tandem solar cell: An overview** "in **IEEE conference proceedings (SCI).**

BOOK CHAPTERS

1. K. Chaturvedi, Vidya and **Rahul**, Chapter topic **"Radiation Hazards: Causes & Effects"** published in **"Elements of Modern Physics",** ISBN:978-81-8329-482-9, pp-273-291 (2012)
2. Rakesh Kumar Sonker, Saroj Radheyshyam Shabajeet, **Rahul Johari** and B.C. Yadav, Chapter topic **"Design and Growth of Metal Oxide Film as Liquefied Petroleum Gas Sensors"** published in **"Energy Analysis and Optimization for Liquefied Natural Gas Process", DOI: 10.5772/intechopen.82082, March 2019**
3. **Rahul,** Rakesh K. Sonker, P. K. Shukla, Pramod K. Singh, Zishan H. Khan, Chapter topic **"Experimental and Characterization Techniques"** published in **"Composite Materials", DOI: 10.1201/9781003080633-5, February 2021**
4. **Rahul,** Sultan Ahmad, Pramod K. Singh, and Zishan H. Khan, Chapter topic **"Studies on Dye-Sensitized Solar Cells Incorporated with Perovskite as Sensitizer Dye"** published in **"Emerging Trends in Nanotechnology",** Print ISBN: 978-981-15-9903-3, Electronic ISBN: 978-981-15-9904-0, **DOI: 10.1007/978-981-15-9904-0, 2021**

5. **Rahul Johari**, Shambhavi, Utkarsh Kumar, Pawan Kumar,Siddhartha, Renu Singh, Devesh Garg, Okai Victor , Pramod K. Singh, Zishan H. Khan, Kaushlendr Agraharii , Chapter topic **"Perovskite based gas sensors" published in "Smart Nanostructure Materials and Sensor Technology", DOI:** 10.1007/978-981-19-2685-3**, 2022**

CONFERENCES WERE ATTENDED & ORAL PRESENTATIONS

- International Conferences Oral Talks –10
- International Conferences Attended -11
- National Conferences Oral Talks –11
- National Conferences Attended -15
- Workshops and webinars-35

REVIEWER FOR

1. Ionics (Springer)
2. International Journal of Optics and Photonic Engineering
3. High-Performance Polymers
4. Phase Transitions (Taylor and Francis)
5. Optik (Elsevier)
6. Journal of Materials Science: Materials in Electronics
7. Journal of Electronic Materials

CONFERENCES ORGANIZED AS AN ACTIVE MEMBER

1. International Conference on Science and Engineering of Materials **"ICSEM -2014"**, **Sharda University, Greater Noida (INDIA).**
2. National Conference on Nanotechnology and Renewable Energy **"NCNRE- 2014"** 28-29 April 2014, **Jamia Millia Islamia, New Delhi (INDIA).**
3. **GIAN-MHRD,** Government of India Sponsored Workshop -Course on **"Organic Light-Emitting Diodes for Future Lighting and Displays" from** 26 December 2017 to 30 December 2017 at and organised by **Organic Electronics and Nanotechnology Research Group,** Jamia Millia Islamia, New Delhi **(INDIA).**
4. International Conference on Science and Engineering of Materials **"ICSEM -2018"** on **6-8 January, Sharda University, Greater Noida (INDIA).**

PROFESSIONAL TRAINING

1. **Organic Light-Emitting Diodes (OLEDs) for future lighting and displays, organized** by the Global Initiative of Academic Networks (GIAN) at Jamia Millia Islamia, New Delhi, India. — 27^{th}–31^{st} December 2017
2. **Diffractive Micro-optics of IR and THz ranges,** organized by the Global Initiative of Academic Networks (GIAN) at JMI, New Delhi, India. — 9^{th} – 13^{th} October 2017
3. **XIX International Workshop on The Physics of Semiconductor Devices, Organized** by Solid State Physics Laboratory, Defence Research and Development Organization and IIT, Delhi, India. — 11^{th}-15^{th} December 2017
4. **Energy Materials: Synthesis to Application-2015,** Organized by Department of Physics, Banaras Hindu University, Varanasi, India. — 1^{st} -7^{th} December 2015

CERTIFICATE COURSES

1. **"Introduction to solar cells"** from Technical University of Denmark (DTU).
2. **"Organic Solar Cells - Theory and Practice"** from Technical University of Denmark (DTU).

HONORS AND AWARDS

1. **"YOUNG RESEARCHER AWARD"** in 5th International Conference of Functional Materials and Devices-ICFMD-2015, organised by Centre of Ionics, University of Malaya, Kuala Lumpur, Malaysia.
2. UGC fellowship for PhD in 2013

EXTRA-CURRICULAR ACTIVITIES

1. **National Cadet Core "C" ARMY WING-Senior Division** training certificate from 54 UP Bn Group Head Quarter Kanpur issued by **Defence Ministry, Government of India.**
2. **Fire Training** Certificate from National Civil Defence, Kanpur (INDIA).
3. Certificate course completed on **"COVID-19 Training for NCC Cadets"** issued by **Department of Personnel and Training, Government of India.**

LANGUAGES

Hindi: Native Language
English: Good listener, speak fluently, advanced reading and writing
Spanish: Beginner

PERSONAL INFORMATION

Name	:	Rahul
Date and place of birth	:	January 1,1985, Etah /India
Father's Name	:	Mr. Satya Prakash Johari
Mother's Name	:	Mrs. Sharda Johari
Hobbies	:	Reading, playing cricket, creating innovative things
Nationality	:	Indian
Marital Status	:	Single
Permanent Address	:	H.No. 159/3 Sarai Mishra G.T. Road, Etah, U.P.-207001, India

REFERENCES

1. **Prof. Zishan Husain Khan**
   Department of Applied Sciences and Humanities, Faculty of Engineering and Technology
   Jamia Millia Islamia (A Central University), New Delhi -110025, India
   Phone: +91 8527820979
   E-mail: zishan_hk@yahoo.co.in, zishanhk@jmi.ac.in

2. **Prof. Rafi Shikler**
   Department of Electrical & Computer Engineering
   Ben-Gurion University of the Negev, Israel
   Phone: +972 524040625
   Email Id: rshikler@bgu.ac.il

Declaration

I do hereby confirm that the information furnished above is true to the best of my knowledge and belief.

Place: India

(*Rahul*)

THANKS