Curriculum Vitae

Personal information:

Name	:	Sobia Waheed
E-mail Id	:	sobia.waheed@iitd.ac.in
Mobile no.	:	+917530904053
Skype Id	:	Sobia369@gmail.com
D.O.B	:	April 16th 1990
Gender	:	Female
Nationality	:	Indian

Education:

2017–2022 — Doctor of Philosophy in photovoltaic (*Thesis submitted*)
Department of Energy Science and Engineering.
Indian Institute of Technology Delhi, New Delhi, India.

2014–2016 — Masters in Technology (M.Tech.) in Nanotechnology
Centre for Nanoscience and Nanotechnology.
Jamia Millia Islamia University, New Delhi, India.
Grade: **9.32** (CGPA) [88.2%]

2011–2014 — Bachelor in Technology (B.Tech.) in Electronics and Communication Engineering
Uttar Pradesh Technical University Lucknow, Uttar Pradesh, India.
Percentage: **76%**

2008–2011 — Diploma in Electronics Engineering
Board of Technical Education Uttar Pradesh Lucknow, Uttar Pradesh, India.
Percentage: **83%**

Publications:

2022 — *Understanding the influences of In-situ annealing and substrate vibration on the charge carrier dynamics of ultrasonic spray coated polymer solar cell*
Sobia Waheed, Saurabh Pareek, Abhijith T, Rakesh Suthar, Punit Sharma, and Supravat Karak.
Journal of Material Science: Material in Electronics (Under Review)

2022 *The effect of UV-Ozone treatment on structural, optical, and dielectric properties of thermally evaporated graphitic carbon nitride thin film*
Saurabh Pareek, Sobia Waheed, and Supravat Karak.
Material Characterization (Under Review)

2022 *Graphitic carbon nitride nanostructures: As molecular modifier for PEDOT:PSS hole transport layer in polymer solar cells*
Saurabh Pareek, Sobia Waheed, and Supravat Karak.
Renewable Energy (Under Review)

2021 *Understanding the Correlation Between Temperature Dependent Performance and Trap Distribution for Nickel Oxide Based Inverted Perovskite Solar Cells*
Aniket Rana, Punit Sharma, Amit Kumar, Saurabh Pareek, Sobia Waheed, Rajiv K. Singh, and Supravat Karak.
IEEE Transactions on Electron Devices 68, no. 8: 3907-3913
DOI: https://doi.org/10.1109/TED.2021.3084906

2021 *Defect mediated improved charge carrier dynamics in hybrid bulk-heterojunction solar cell induced by phase pure iron pyrite nanocubes*
Punit Sharma, Aniket Rana, Sobia Waheed, Saurabh Pareek, and Supravat Karak.
Nanotechnology 32, no. 26: 265401
DOI: https://doi.org/10.1088/1361-6528/abe1f2

2020 *Performance improvement of ultrasonic spray deposited polymer solar cell through droplet boundary reduction assisted by acoustic substrate vibration*
Sobia Waheed, Saurabh Pareek, Punit Sharma, and Supravat Karak.
Semiconductor Science and Technology 36, no. 1: 015002.
DOI: https://doi.org/10.1088/1361-6641/abbba8

2020 *Effect of In Situ Annealing on Phase Segregation and Optoelectronic Properties of Ultrasonic-Spray Deposited Polymer Blend Films*
Sobia Waheed, Saurabh Pareek, Prerna Singh, Punit Sharma, Aniket Rana, and Supravat Karak.
IEEE Journal of Photovoltaics 10, no. 6: 1727-1734.
DOI: 10.1109/JPHOTOV.2020.2983304

2020 Structural and optical properties of exfoliated graphene-like carbon nitride into nanosheets and quantum dots
Saurabh Pareek, Sobia Waheed, Punit Sharma, and Supravat Karak.
Materials Characterization 169: 110646.
DOI: https://doi.org/10.1016/j.matchar.2020.110646

2020 *Graphitic carbon nitride quantum dots (g-C_3N_4) to improve photovoltaic performance of polymer solar cell by combining Förster resonance energy transfer (FRET) and morphological effects*
Saurabh Pareek, Sobia Waheed, Aniket Rana, Punit Sharma, and Supravat Karak.
Nano Express 1, no. 1: 010057.
DOI: https://doi.org/10.1088/2632-959X/ab9b2f

2020 *Scalable organic bulk heterojunction solar cells fabricated by ultrasonic spray deposition technique*
Sobia Waheed, Prerna Singh, Sourabh Pareek, Supravat Karak
AIP Conference Proceedings 2276, 020046
DOI: https://doi.org/10.1063/5.0026026

Conferences and Seminars:

2021 Sobia Waheed, Supravat Karak, "Ultrasonic Spray-coated Large-Area Organic Solar Cell", International Workshop on Physics of Semiconductor Devices (IWPSD-21), at Indian Institute of Technology Delhi, New Delhi, India. [Oral presentation].

2020 Sobia Waheed, Saurabh Pareek, Supravat Karak, "Identifying Key Limiting Factors for Ultrasonic Spray Deposited Scalable Organic Solar Cell", 5th International Conference on Emerging Electronics (ICEE-20), at Indian Institute of Technology Delhi, New Delhi, India. [Poster presentation].

2019 Sobia Waheed, Supravat Karak, "Ultrasonic Spray Deposition of Organic Solar Cell: A Parameter Dependent Study of Device Performance", International Workshop on Physics of Semiconductor Devices (IWPSD-19), at S. N. Bose National Center of Basic Sciences, Kolkata, India. [Poster presentation].

2019 Sobia Waheed, Prerna, Saurabh Pareek, Supravat Karak, "Scalable organic bulk heterojunction solar cells fabricated by ultrasonic spray deposition technique", International conference on Advanced Materials (ICAM-2019), at Jamia Millia Islamia, New Delhi, India. [Poster presentation].

2019 Sobia Waheed, Prerna, Saurabh Pareek, Supravat Karak, "An insight into the film formation depending on spraying parameters for ultrasonic spray-coated active layer", International Workshop and Conference on Perovskite and Hybrid Photovoltaic (ICPHPV-2019), at Indian Institute of Technology, New Delhi, India. [Poster presentation].

2015 3rd UGC-UKIERI IUCRACS Conference on "Recent Advances in Chemical Sensors" at Gargi College, New Delhi, India. [Attended]

2015	National Seminar on "Nanomaterials: Synthesis, Characterization & Applications" at Jamia Millia Islamia, New Delhi, India. [Attended]
2016	International Conference on "Advances in Nanomaterials and Nanotechnology (ICANN-2016)" at Jamia Millia Islamia, New Delhi, India. [Attended]

Projects Undertaken:

Dec 20
Jan 2016–Jun 2016 M.Tech. Project ("Sensing of Ammonium Nitrate by SWNT-TFR sensor")

Solid State Physics Laboratory (SSPL), DRDO, Delhi, India.

- Development of SWNT-Thin Film Resistive (TFR) sensor
- Sensing of Ammonium Nitrate and other gases
- Characterization and analysis of SWNT film before and after sensing.
- Analysis of data obtained in SEM and Raman spectroscopy.

July 2014–Dec 2015 B.Tech. Project ("Thermoelectric Refrigerator")

Uttar Pradesh Technical University (UPTU), U.P., India.

- Modeling and prototyping of "Thermoelectric Refrigerator"
- Tools used: simulator (ISIS PROTEUS and ARES PROTEUS)

Experimental Skills:

- **Thin Film Processing**
  - Experience in handling (operation and maintenance) vacuum systems based on Rotary, and Diffusion pumps.
  - Practice and experience of routine processing steps such as handling, cleaning, patterning, surface (O_3 plasma and O_3 treatment) treatment of Indium Tin Oxide (ITO) coated glass, Fluorine Tin Oxide (FTO) coated glass, and flexible PET substrates.
  - Preparation of thin films using a variety of thin-film deposition techniques (standard and homemade), such as Spin-Coating, Spray Deposition, Drop-Casting, and Vacuum Sublimation techniques.
  - Involved in the development of fabrication and characterization lab for polymeric semiconductor-based processing in Organic and Hybrid Electronic Device Laboratory at IIT Delhi.

- **Thin Film Characterization**
  - Learnt the installation, maintenance, and operation of optical spectroscopy-based instruments viz. UV-Vis NIR spectrophotometer, Photoluminescence setup.
  - Learnt the installation, maintenance, and operation of electrical characterization tools viz. Solar simulator setup, LCR meter, Current- Voltage source.
  - Hands-on experience in handling (operation and maintenance) the UV-Vis-NIR spectrophotometer at Nanoscale Research Facility (NRF), IIT Delhi.

- **Synthesis and Characterization of Nanomaterials**
  - Experience in synthesizing Nanomaterials using various routes like Sol-Gel, Solvothermal, Chemical exfoliation, Refluxing, etc.
  - Experience in handling various types of equipment like Muffle Furnace, Hot Air Oven, Vacuum Oven, Rotamental, Probe Sonicator, etc.

Workshop and Training:

2017	Workshop on Organic Photovoltaics and Electronics Technology 2017 (OPET-17), at **CSIR National Physical Laboratory**, New Delhi, India.
2013	1 month summer training at **Hindustan Aeronautical Limited (HAL),** Lucknow, India.
2010	1 month summer training at **"Divisional Railway Manger (DRM), LKO",** from **Signal and Telecom (S n T) Department** NORTHERN RAILWAY Lucknow, India.

Membership:

Since 2021	Member at Material Research Society (MRS)

Awards and Achievements:

2018	**INSPIRE FELLOWSHIP** Awarded by the Department of Science and Technology (DST) under "Innovation in Science Pursuit for Inspired Research (INSPIRE)" scheme.
2018	**GOLD Medal** For securing top position in Master in Nanotechnology, at Jamia Millia Islamia University, New Delhi.
2015	Qualified **UGC-National Eligibility Test (NET)** Eligible for the post of Assistant Professor in Indian Universities and colleges
2014	Qualified **Graduate Aptitude Test in Engineering (GATE)** Conducted by Department of Higher Education, Ministry of Education (MoE)
2018	Ph.D. representative and Secretary in Energy Forum at Department of Energy Science and Technology, IIT Delhi.
2017	Published an article in *Crystal*, a technical bulletin of Solid State Physics Laboratory (SSPL), Delhi, titled "Sensing of Ammonium Nitrate by SWNT TFR Sensor" [ISSN 2454-6925].

Language Skills:

Mother tongues: Hindi, Urdu.
Other languages: English (Proficient user), Japanese (Basic), French (Basic).

References:

- **Dr. Supravat Karak (Asst. Prof.),**
  Department of Energy Science and Engineering,
  Indian Institute of Technology Delhi, India.
  Email-Id: supravat@ces.iitd.ac.in

- **Dr. Samina Hussain (Asst. Prof.)**
  Centre for Nanoscience and Nanotechnology,
  Jamia Millia Islamia Delhi, India.
  Email-Id: shusain3@jmi.ac.in