


## Brief Biodata

**Name: Dr. Sanjay Kumar Srivastava**

<b>Designation:</b>	Principal Scientist & Associate Professor (AcSIR)	
<b>DP No. and Name:</b>	<b>4.01; Photovoltaic Metrology Group</b>	
<b>DU No. and Name:</b>	<b>4.0; Advanced Materials and Device Metrology</b>	
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<b>Date of Joining CSIR-NPL:</b>	<b>4 January, 2007</b>	
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### Research Area/ Interest

- Photovoltaic Metrology
- Efficient silicon solar cells: Homo-junction; organic semiconductor/Si hybrid and inorganic semiconductor/Si hetero-junctions based.
- Thin/Flexible silicon solar cells
- Silicon nanostructures based novel solar cell concepts for next generation photovoltaic applications
- Novel light trapping schemes: silicon nanostructures such as arrays of nanowires, nanotips, nano scale-textured silicon, nano and micro pyramids, inverted pyramids, their light trapping properties for cost effective PV devices

### Educational Qualifications

*(Please write latest qualification first)*

Degree	Subject	University/ Institute	Year
Ph.D.	Physics	Indian Institute of Technology Delhi, New Delhi, India	2007
M. Tech.	Materials Science & Engineering	Indian Institute of Technology Bombay, Mumbai, India	2001
M.Sc.	Physics	Banaras Hindu University (BHU) Varanasi, India	1999

### Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
MHRD-GATE Fellowship	IIT Bombay	July 1999	June 2000	Materials Science
CSIR-JRF	IIT Bombay	July 2000	Jan 2001	Materials Science (solid state electrolytes)

MHRD-IIT Delhi Fellowship (JRF & SRF)	IIT Delhi	2001	2007	Carbon nanostructures for field emission applications
Lecturer	Agra College Agra (Agra Univ. Agra)	July 2005	Jan.2007	Physics
Junior Scientist	CSIR-NPL, New Delhi	Jan. 2007	Jan. 2010	Silicon/silicon nanostructures photovoltaic
Visiting Fellow, BOYSCAST Fellowship, DST, Govt of India	Max Planck Institute for the Science of Light, Erlangen, Germany	Aug. 2011	Aug. 2012	Silicon nanowires based thin optical materials for photovoltaic applications
Scientist	CSIR-NPL, New Delhi	Jan. 2010	Jan. 2013	Silicon/silicon nanostructures based photovoltaic devices
Sr. Scientist	CSIR-NPL, New Delhi	Jan. 2013	Jan. 2017	Silicon photovoltaic devices, PV metrology
Principal Scientist	CSIR-NPL, New Delhi	Jan. 2017	Till date	Silicon photovoltaic devices, PV metrology

### No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
55	Nil	25	Book Chapters: 10	90

### Selected Publications

- *Highly efficient PEDOT:PSS/Silicon hybrid solar cells via effective surface micro-engineering of low-cost solar-grade silicon wafers, ACS Applied Energy Materials, 4 (2021) 4181–4198.*
- *Enhanced photovoltaic performance of PEDOT:PSS/Si solar cells using hierarchical light trapping scheme, Solar Energy, 170 (2018) 221-233. (Citations: >20)*
- *Antireflective ultra-fast nanoscale texturing for efficient multi-crystalline silicon solar cells, Solar Energy 115 (2015) 656-667. (Citations: >35)*
- *Large area fabrication of vertical silicon nanowire arrays by silver assisted single-step chemical etching and formation kinetics, Nanotechnology, 25, (2014) 175601 (17 pages). (Citations: >105)*

- *Probing photo-carrier collection efficiencies of individual silicon nanowires diodes on a wafer substrate*, **Nanoscale**, 6, (2014) 7897-7902. **Listed in HOT articles of Nanoscale 2014.**
- *Silver catalyzed nano-texturing of silicon surfaces for solar cell applications*, **Sol. Energy Mater. & Sol. Cells**, 100, (2012) 33-38. (Citations: >135)
- *Nanowire arrays in multi-crystalline silicon thin films on glass: a promising material for research and applications in nano-technology*, **Nano Lett.** 12 (8), (2012) 4050-4054. (Citations: >80)
- *Fabrication of silicon nanowire arrays based solar cell with improved performance*, **Sol. Energy Mater Sol. Cells**, 95, (2011), 215-218. (Citations: >200)-**Listed in TOP 25 Cited articles of SOLMAT (1<sup>st</sup> Jan 2016 to Dec 2016).**
- *Excellent Antireflection Properties of Vertical Silicon Nanowires Arrays*, **Sol. Energy Mater Sol. Cells**, 94, (2010) 1506-1511. (Citations: >275). **Listed in TOP 25 Cited articles of SOLMAT (1<sup>st</sup> Jan 2015 to 31<sup>st</sup> Dec 2015).**

### **Patents**

- Granted:02 (Granted, US Patent No. 10811546 B2 granted on 20/10/2020 and EU Patent No. EP 3 381 058 B1; Granted on 04.03.2020);
- Filed: 01 (India)

### **Current Activities**

(Not more than 100 words)

- Photovoltaic Metrology: Setting national primary standard for solar cell calibration
- Silicon-based Photovoltaics:
  - Conventional homo-junction
  - Heterojunction/hybrid solar cells (Organic semiconductor/Si and TMOs/Si)
  - Thin flexible Si solar cells
  - Unit process development for addressing optical, electronic and electrical losses

### **Honour(s)/Award(s)/ Fellowship(s)**

#### **Awards:**

- **CSIR Young Scientist Award-2013** in the area of **Physical Sciences**.
- **Young Investigator Award** for “Wet chemically etched silicon nanowires based p-n junction solar cell” in the International conference “Next generation solar energy’: from fundamentals to applications” held in Erlangen, **Germany, 12-14 Dec 2011.** (<http://bayern-innovativ.de/nextgeneration-pv2011/gallery>)

#### **Fellowships:**

- **BOYSCAST fellowship 2010-11** (Aug 2011-Aug 2012) Department of Science and Technology (DST), Government of India.

### **Contributions to AcSIR**

As Faculty AcSIR, currently involved in

- Curriculum design and teaching of courses for Ph.D. students
  - (1) Advanced Electronic Materials & Semiconductor Devices
  - (2) Research and Publication Ethics (RPE)

- Member: Doctoral advisory committee (DAC) for several AcSIR Ph.D. students
- Member: Evaluation of project proposals of AcSIR research students.
- Currently mentoring 6 students for their Ph. D thesis in various aspects of materials and devices development for efficient solar photovoltaic devices.

#### **Membership of Professional Societies/ Institutions**

Life Member : Electron Microscopy Society of India (EMSI)  
Carbon Society of India  
Metrology Society of India

#### **Any other Information**

*(Not more than 100 words)*