

Brief Biodata

Name: Dr. Govind

Designation:	Chief Scientist & Professor, Academy of Scientific & Innovative Research (AcSIR)	
DP No. and Name:	3.04, Sensor Devices & Metrology	
DU No. and Name:	3, Environmental Sci. & Biomed. Inst. Metrology	
Email:	govind.npl@nic.in , govindnpl@gmail.com	
Date of Joining CSIR-NPL:	23/07/2004	
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Research Area/ Interest

III-Nitrides Materials growth, Chemiresistive Gas Sensor, Metal Oxides & Two dimensional (2D) Materials Growth & Device fabrication, Optoelectronic device fabrication, Surface & Interface Physics, Electronic Structure, Optical Characterization, Plasmonics, etc.

Educational Qualifications

(Please write latest qualification first)

Degree	Subject	University/ Institute	Year
Ph.D.	Solid State Physics	G.B. Pant Univ. Ag. & Tech. Pantnagar, UK, India	2000
M.Sc.	Physics	G.B. Pant Univ. Ag. & Tech. Pantnagar, UK, India	1996

Academic / Research Experience

Grade / Post	Institute	Duration		Research Field
		From	To	
Chief Scientist & Professor, AcSIR	CSIR-National Physical Laboratory, New Delhi, India	July 2022	Till date	Head, Sensor Devices & Metrology at CSIR National Physical Laboratory, India III-Nitrides Materials growth, Chemiresistive Gas Sensor, Metal Oxides & Two dimensional (2D)
Senior Principal Scientist & Professor, AcSIR	CSIR-National Physical Laboratory, New Delhi, India	July 2017	June 2022	Sensor Devices & Metrology, III-Nitrides Materials growth, Chemiresistive

				Gas Sensor, Metal Oxides & Two dimensional (2D)
Principal Scientist, & Associate Professor, AcSIR	CSIR-National Physical Laboratory, New Delhi, India	July 2012 -	June-2017	Nitride Epitaxy, Photodetectors, Solar Cells
Senior Scientist, & Assistant Professor, AcSIR	CSIR-National Physical Laboratory, New Delhi, India	July 2008	June 2012	Nitride Epitaxy, Photodetectors, Solar Cells, Surface /Interface,
Scientist	CSIR-National Physical Laboratory, New Delhi, India	July 2004 -	July 2008	
Research Scientist (DST) Research Associate (CSIR)	CSIR-National Physical Laboratory, New Delhi, India	May 2000	July 2004	P.I. Professor S.K. Joshi, Ex-Director General, CSIR
BOYSCAST Fellow	Department of Physics & Astronomy, Rutgers-The State University of New Jersey, New Jersey, USA	June 2007	July 2008	with Prof. Theodore E. Madey, Ex-President, American Vacuum Society (AVS), USA, Director, Laboratory of Surface Modifications, Rutgers-The State University of New Jersey, Piscataway, New Jersey, USA
Visiting Scientist	Institute of Physics, Humboldt University, Berlin, Germany	Sep 2017	Oct 2017	
Yusuf-Hamid International Exchange Fellow of The Royal Society, London, UK	The Cambridge University, UK	June 2024	July 2024	Prof. Manish Chowwalla, Goldsmith Professor, 'Department of Materials Science & Metallurgy, The Cambridge University, UK

No. of Publications

No. of Publications in SCI Journals	No. of Publications in non-SCI Journals	No. of Publications in Conference Proceedings	Books	Total
390	13	8	9	420

Selected Publications

1. Preeti Goswami & Govind Gupta
Recent Progress of Flexible NO₂ and NH₃ Gas Sensors based on Transition Metal Dichalcogenides for Room Temperature Sensing
Materials Today Chemistry, 23, 100726 (2022)
2. Aditya Yadav, Preetam Singh and Govind Gupta
Dimension dependency of Tungsten Oxide (WO₃) for efficient Gas Sensing
Environmental Nano: Chemical, 9, 40-60 (2022)
3. Urvashi Varshney, Neha Aggarwal & Govind Gupta
Current Advances in Solar-blind Photodetection Technology: Oxides & Nitrides
Journal of Materials Chemistry C, 10, 1573 (2022)
4. Ajit Dash, Anuj Sharma, S.K.Jain, B. Sachitra Kumar Patra, Abhiram Gundimeda, Sandipan Mallik, Govind Gupta
Influence of current conduction paths and native defects on gas sensing properties of polar and non-polar GaN
Journal of Alloys & Compounds, 898, 162808 (2022)
5. Shubhendra Kumar Jain, Pargam Vashishtha, Shruti Nirantar, Liangchen Zhu, Cuong Ton-That, Taimur Ahmed, Sharath Sriram, Sumeet Walia, Govind Gupta, Madhu Bhaskaran
Influence of Temperature on Photodetection Properties of Honeycomb-like GaN nanostructures
Advanced Material Interfaces 8 (14), 2100593 (2021)
6. S.K. Jain, Mei Low, P. Taylor, S. A. Tawfik, Michelle Spencer, Sruthi Kuriakose, Aram Arash, Chenglong Xu, Sharath Sriram, Govind Gupta, Madhu Bhaskaran, and Sumeet Walia
2D/3D hybrid of MoS₂/GaN for a high-performance broadband photodetector
ACS Applied Electronic Materials, 3(5) 2407 (2021)
7. Lalit Goswami, Neha Aggarwal, Shubhendra Jain, Pargam Vashishtha, Shruti Nirantar, Jahangeer Ahmed, M. A. Majeed Khan, Rajeshwari Pandey and Govind Gupta
Fabrication of GaN Nano-Towers based Self-Powered UV Photodetector
Scientific Reports, 11, 10859 (2021)
8. Neha Aggarwal, Shibin Krishna, Lalit Goswami, and Govind Gupta
Inclination of Screw Dislocations on the Performance of Homoepitaxial GaN based UV Photodetectors
Materials Science & Engineering B, 263, 114879 (2021)
9. S.K. Jain, R.R. Kumar, Neha Aggarwal, Pargam Vashishtha, Lalit Goswami, Sruthi Kuriakose, Akhilesh Pandey, M. Bhaskaran, S.Walia, Govind Gupta
Current Transport and Band Alignment study of MoS₂/GaN and MoS₂/AlGaN Heterointerfaces for Broadband Photodetection Application
ACS-Applied Electronic Materials, 2(3), 710 (2020)
10. Lalit Goswami, N. Aggarwal, R.Verma, S.Bishnoi, S.Husale, R. Pandey and Govind Gupta
Graphene quantum dots sensitized ZnO-Nanorods/GaN-Nanotowers heterostructure based high performance UV Photodetector
ACS-Applied Materials Interfaces, 12, 47038 (2020)
11. Neha Aggarwal, and Govind Gupta
Enlightening the Gallium Nitride based UV Photodetectors
Journal of Materials Chemistry C, 8, 12348 (2020)
12. Lalit Goswami, Neha Aggarwal, Manjri Singh, Rajni Verma, Pargam Vashishtha, Shubhendra K. Jain, Jai Tawale, Rajeshwari Pandey and Govind Gupta
GaN Nanotowers Grown on Si (111) and Functionalized with Au Nanoparticles and ZnO Nanorods for Highly Responsive UV Photodetectors
ACS Applied Nano Materials, 3, 8104, (2020)
13. Neha Aggarwal, Shibin Krishna, Shubhendra Kumar Jain, Arzoo Arora, Lalit Goswami, Alka Sharma, Sudhir Husale, Abhiram Gundimeda, Govind Gupta
Impact on Photon-Assisted Charge Carrier Transport by Engineering Electrodes of GaN based

UV Photodetectors

Journal of Alloys & Compound, 785, 883-890 (2019)

14. M. Mishra, A. Gundimeda, T. Garg, Ajit Dash, Susanta Das, Vandana, and Govind Gupta
ZnO/GaN based self-powered schottky barrier photodetectors: Influence of interfacial states on UV sensing

Applied Surface Science, 478, 1081-1089 (2019)

15. Shibin Krishna TC, Neha Aggarwal, Abhiram Gundimeda, Alka Sharma, Sudhir Husale, K.K. Maurya, Govind Gupta

Correlation of Donor Acceptor Pair Emission on the Performance of GaN based UV Photodetector

Material Science in Semiconductor Processing, 98, 59 (2019)

16. Monu Mishra, Naman Kumar Bhalla, Ajit Dash and Govind Gupta

Nanostructured GaN and AlGaIn/GaN heterostructures for catalyst-free low-temperature CO sensing

Applied Surface Science, 481, 379 (2019)

17. Neha Aggarwal, Shibin Krishna, S.K. Jain, K. K. Maurya, S. Singh, M. Kaur and Govind Gupta

Microstructural Evolution of High Quality AlN by modulating the Growth Conditions in PAMBE

Materials Science & Engineering B, 243, 71 (2019)

18. S.K. Jain, N. Aggarwal, S. Krishna, R. Kumar, S. Husale, Vinay Gupta and Govind Gupta

GaN-UV photodetector integrated with Asymmetric MSM structure for enhanced responsivity

Journal of Material Science: Materials in Electronics 1-6 (2018)

19. A. Gundimeda, S. Krishna, N. Aggarwal, A.Sharma, N.Dilawar, K. K. Maurya, S. Husale, Govind Gupta

Fabrication of non-polar GaN based highly responsive and fast UV Photodetector

Applied Physics Letters-110, 103507 (2017)

20. N. Aggarwal, S. Krishna, A. Sharma, L. Goswami, D. Kumar, S. Husale, Govind Gupta

Realization of Highly Responsive Self-driven UV Photodetector using GaN Nanoflowers

Advanced Electronic Materials, 1700036 (2017)

21. M. Mishra, S. Krishna, N. Aggarwal, A. Gundimeda and Govind Gupta

Electronic and Chemical Structure Analysis of Nanoflowers Decorated GaN and AlGaIn/GaN heterostructure

Journal of Alloys & Compound, 708, 385 (2017)

22. M. Mishra, A. Gundimeda, S. Krishna, N. Aggarwal, B. Gahtori, N. Dilawar, V. V. Agrawal, M. Singh, R. Rakshit and Govind Gupta

Wet chemical etching induced stress relaxed nanostructures on polar & non-polar epitaxial GaN films

Physical Chemistry Chemical Physics, 19, 8787 (2017)

23. S. Krishna, A. G. Reddy, N. Aggarwal, M. Kaur, S. Husale, D. Singh, M.Singh, R.Rakshit, K.K. Maurya, Govind Gupta

Enhanced current transport in GaN/AlN based single and double barrier heterostructures

Solar Energy & Solar Materials, 170, 160 (2017)

24. Shibin Krishna, Alka Sharma, Neha Aggarwal, Sudhir Husale and Govind Gupta

Enhanced Photo-responsivity and fast photo-response of Indium Nitride ultra-broadband photo-detector

Solar Energy & Solar Materials- 172, 376-383(2017)

Patents

A PROCESS FOR THE SYNTHESIS OF LUMINESCENT UNDOPE ZN₂SiO₄ NANOPHOSPHOR, Inventors: Dhiraj, Bipin Kumar Gupta, Surinder Pal Singh, Sukhvir Singh, Govind, Avanish Kumar Srivastava Indian Patent no. IN201811002025 Published on 19/07/2019- India

Current Activities

(Not more than 100 words)

- i. Design the recipe, process optimization and growth of thin films and nanostructures based on III-nitrides, metal oxides & 2D materials.
- ii. Fabrication of sensor devices & engineered electrodes for reliable & accurate detection.
- iii. Testing the performance of the fabricated devices in terms of responsivity, repeatability, sensitivity, selectivity and stability.
- iv. Development of prototype broadband Optical detectors & Gas sensor in the laboratory and the field.

Honour(s)/Award(s)/ Fellowship(s)

Name of Award	Organization	Year of Award
Fellow	The Indian Chemical Society, India	2024
Fellow	The Optical Society of India	2024
IETE-CEOT (94) AWARD (BIENNIAL) 2024	The Institute of Electronics and Telecommunication Engineers (IETE), India	2024
MRSI-Distinguished Lectureship Award	The Materials Research Society of India	2023-24
Yusuf-Hamid International Exchange Award	The Royal Society, London, UK Host The Cambridge University, UK	2022
Fellow	The Institute of Physics, London, UK	2023
Fellow	The Royal Society of Chemistry, London, UK	2022
Fellow	The Electron Microscopy Society of India	2023
Fellow	The Institute of Electronics and Telecommunication Engineers (IETE), India	2022
Fellow	The Optical Society of India	2024
Associate Academician	Asia Pacific Academy of Materials (APAM)	2019
Senior Member	Institute of Electrical and Electronics Engineers, (IEEE) USA	2021
MRSI MEDAL	The Materials Research Society of India	2018
Young Scientist Medal	The National Academy of Sciences, India (NASI)	2010
Outstanding Young Scientist of the Year	CSIR-National Physical Laboratory	2009
Young Scientist Award	IFW-ICNN, Gurgaon	2009
BOYSCAST Fellowship	Ministry of Science & Technology, GoI	2007
Young Scientist Award	Department of Science & Technology, GoI	2006

Contributions to AcSIR

- Involved in teaching the Thin Films Physics & Technology (**AcSIR-32-PS-AD-003**) to registered Ph.D. students.
- Supervised 17 students enrolled for Ph. D under my supervision/co-supervision (13 have completed thesis)
- Supervised 25 students registered for Ph.D. in AcSIR as a member of Doctoral Advisory committee (23 completed, 2 ongoing).
- 33 Master's and 21 Bachelor's Project Dissertation
- Involved in various capacity to help AcSIR student in Review, Project, CSIR-800 proposal evaluation.

Membership of Professional Societies/ Institutions

- **Executive Committee Member**, Semiconductor Society of India (SSI)
- **Executive Committee Member**, Electron Microscopy Society of India (EMSI)
- **Secretary & Executive Committee member**, EMSI- North Zone,
- **Member**, Royal Society of Chemistry, UK
- **Member**, Institute of Physics, UK
- **Member**, IEEE, USA
- **Member**, American Chemical Society (ACS), USA
- **Member**, IEEE Electron Devices Society, USA
- **Member**, IEEE Council on Electronic Design Automation
- **Member**: IEEE Nanotechnology Council
- **Member**, IEEE Sensors Council
- **Life Member**, Institute of Electronics & Telecommunication Engineers, India
- **Life Member**, Indian Physics Association
- **Life Member**, Materials Research Society of India (MRSI)
- **Life Member**, Semiconductor Society of India, (SSI)
- **Life Member**, Metrology Society of India, (MSI)
- **Life Member**, Electron Microscopy Society of India Secretary (EMSI)
- **Member**, International Association for Advanced Materials (IAAM)
- **Member**, Vigyan Bharti (Vibha)

Any other Information

(Not more than 100 words)

- 1. Setting up "Gas Sensor Testing and Certification Facility" "(GaSTeC Facility)"** Funded by Ministry of Electronics & Information Technology & CSIR, 4 year duration (Nov 2024- Nov 2028) Dr. Govind Gupta (**Project Co-ordinator**) : **Rs. 1894.34 lakhs**
- 2. Joint Research proposals under BRICS Call-2021 entitled as "High output power emitters and sensitive detectors based on AlGaIn nanoheterostructures for deep-ultraviolet radiation: towards biological applications (BIO-LIGHT)"** with Russian counterpart **Prof. V. N. Jmerik**, IOFFE Institute, St. Petersburg, Russia & Chinese counterpart **Prof. X. Wang**, Peking University, China, **Dr. Govind Gupta** (Principal Co-ordinator): **Rs.100.70 lakhs**
- 3. Development of Metal Oxide & Nitride based Gas Sensors**, Mission mode project of CSIR-NPL (**Project Leader**) (**Ongoing**): **Since 2016-(200 Lakhs)**

- 4. Fabrication of efficiency enhanced nanostructured InGaN/GaN solar cells** (Joint Project with Indian Institute of Technology, Delhi) funded under Clean Energy Research Initiative (CERI) of Department of Science & Technology, Govt – July 2016- Oct 2020(**Principal Investigator**):**59.67 Lakh (Completed)**
- 5. MBE grown GaN/In_xGa_{1-x}N high efficiency multi junction Solar cell** under the project entitled Development of Advanced Materials for Next Generation Energy Efficient Devices (D-NEED)funded by CSIR under 12th FYP 2012-1017 (**Project Leader**): **8.00 Crore (Completed)**
- 6. Growth & Characterization of III-nitride Hetero-structures for Solid State Lighting** under Efficient Silicon Photovoltaics with Smart Electronics and Lighting Systema network project sponsored by CSIR under Technologies and Products for Solar energy Utilization through Networks- “TAP-SUN” **2011-2017 (Project Leader): 3.63 Crore (Completed)**
- 7. Formation of Alkali Metals Nanostructures on reconstructed low & high index silicon surfaces** funded by Department of Science & Technology under Fast track Young Scientist scheme **2007-2010 (Principle Investigator).11.23 Lakh (Completed)**
- 8. Fabrication of LED Devices and Systems for Solid State Lighting**, A supra-institutional network project sponsored by CSIR under 11th FYP **2007-2012 (Team member): 48.35 Crore (Completed)**
- 9. Surface Analysis of dispenser cathodes for high power microwave tubes**, A supra-institutional network project sponsored by CSIR under 11th FYP **2007-2012 (Team member):66.0 Lakh (Completed)**