Amit Sanger

Scientist, SRI New Delhi

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Education

PhD
(Title: *Nanostructured Thin Films for Gas Sensing and Energy Storage Applications*), July 2013 – May 2017
IIT Roorkee, Roorkee, India

MTech (Nanotechnology)
July 2011 – June 2013, 8.15 CGPA
IIT Roorkee, Roorkee, India

MSc (Physics-Materials)
July 2008 – June 2010, 74.10%
Jamia Millia Islamia, New Delhi, India

BSc (PCM)
July 2005 – June 2008, 69.03%
MJP Rohilkhand University, Bareilly, India

10+2
July 2004 – June 2005, 76%
Uttar Pradesh Board, India

Highschool
July 2002 – June 2003, 61.83%
Uttar Pradesh Board, India

Research Field

Solar Cells, Thermoelectric Devices, Piezoelectric Devices, Pyroelectric Devices, Supercapacitors, Gas Sensors, Water Splitting, Optoelectronics, Electrical Transport Properties

Skills

High Vacuum Techniques: Sputtering, Pulsed Laser Deposition, Thermal Vapor Deposition, Chemical Vapor Deposition, E-beam Deposition, Reactive Ion Etching, Atomic Layer Deposition
Other Fabrication Techniques: Electrochemical Syntheses, Electrospinning, 3D-Printing, Photolithography, Spray Pyrolysis, Chemical Syntheses, Polymer Processing, Chemical Bath Deposition, Process Engineering
Characterization tools: Field Emission-Scanning Electron Microscope, Transmission Electron Microscope, X-Ray Diffraction, Atomic Force Microscope, X-Ray Photoelectron Spectroscopy, UV-Vis Spectroscopy, Raman Spectroscopy, Photoluminescence Spectroscopy, Fourier-Transform Infrared Spectroscopy, X-ray Fluorescence Spectroscopy, Gas Chromatography, Gas Chromatography-Mass Spectroscopy, Inductively Coupled Plasma-Optical Emission Spectrometry, Inductively Coupled Plasma Mass Spectrometry
Software: MS Office, COMSOL Multiphysics, Origin, Autocad 3DS Max
Experience of working in Cleanroom with class 1000 and 100, glove boxes from MBraun, KOREA KIYON and DANVEC

Awards

Senior Research Fellowship, MHRD, 2013-2017
Junior Research Fellowship, MHRD, 2011-2013
Graduate Aptitude Test in Engineering, 2011

Work Experience

Scientist
May 2019 – Till Date
Shriram Institute for Industrial Research, New Delhi, India

Postdoc Research Associate
July, 2017 – April, 2019
ECOMAT Lab, Department of Materials Science and Engineering, UNIST, South Korea

Senior Research Fellow
July 2013 – May 2017
Instrumentation Center, IIT Roorkee, India

Junior Research Fellow
July 2012 – June 2013
Department of Physics, IIT Roorkee, India

Research Assistant
July 2009 – June 2010
Department of Physics, Jamia Millia Islamia, New Delhi, India

Journal Reviewer

Thin Solid Films, Vacuum, Applied Surface Science, Ceramics International, Sensors and Actuators B: Chemical, Journal of Physics & Chemistry of Solids, Materials Science in Semiconductor Processing, Applied Optics, Polymer, Microchemical Journal, Optical Materials Express, Journal of Alloys and Compounds, International Journal of Hydrogen Energy

Patents

1.Gas sensor and manufacturing method of the same (S. K. Patent 10-2019-0150378)
2.Transparent gas sensor comprising free-standing nanofibers and fabrication method thereof (S. K. Patent 10-2018-0101266)
3.Room temperature operable gas sensor using hollow nanofibers and fabrication method thereof (S. K. Patent 10-2018-0101267)

Peer Reviewed Publications

(Google Scholar Citations **1229**, h-index 24, i-10 index 33)

1. Stretchable and colorless freestanding microwire arrays for transparent solar cells with flexibility, **Light: Science & Applications - Nature**, 2019, 8, 121. (I.F.- 17.9)
2. Transfer of ultrathin molybdenum disulfide and transparent nanomesh electrode onto silicon for efficient heterojunction solar cells, **Nano Energy**, 2018, 50, 649-658. (I.F.- 17.9)
3. Morphology-controlled aluminum-doped zinc oxide nanofibers for highly sensitive NO_2 sensors with full recovery at room temperature, **Advanced Science**, 2018, 5, 1800816. (I.F.- 16.8)
4. Increasing the thermoelectric power factor of solvent treated PEDOT:PSS thin films on PDMS by stretching, **Journal of Materials Chemistry A**, 2018, 6, 15621. (I.F.- 12.7)
5. Highly sensitive and selective hydrogen gas sensor using sputtered grown Pd decorated MnO_2 nanowalls, **Sensors and Actuators B: Chemical**, 2016, 234, 8-14. (I. F. -7.5)

6. Palladium decorated silicon carbide nanocauliflowers for hydrogen gas sensing application, **Sensors and Actuators B: Chemical**, 2017, 242, 694-699. (I. F. -7.5)
7. A fast response/recovery of hydrophobic Pd/V_2O_5 thin films for hydrogen gas sensing, **Sensors and Actuators B: Chemical**, 2016, 236, 16-26. (I. F. -7.5)
8. Fast and reversible hydrogen sensing properties of Pd/Mg thin film modified by hydrophobic porous silicon substrate, **Sensors and Actuators B: Chemical**, 2015, 213, 252-260. (I. F. -7.5)
9. MoS_2 hybrid heterostructure thin film decorated with CdTe quantum dots for room temperature NO_2 gas sensor, **Sensors and Actuators B: Chemical**, 2020, 305, 127437. (I. F. -7.5)
10. Sputtered Synthesis of MnO_2 Nanorods as Binder Free Electrode for High Performance Symmetric Supercapacitors, **Electrochimica Acta**, 2016, 222, 1761-1769. (I.F.- 6.9)
11. An efficient α-MnO_2 nanorods forests electrode for electrochemical capacitors with neutral aqueous electrolytes, **Electrochimica Acta**, 2016, 220, 712-720. (I.F.- 6.9)
12. One step sputtered grown MoS_2 nanoworms binder free electrodes for high performance supercapacitor application, **International Journal of Hydrogen Energy**, 2018, 43, 11141-11149. (I.F.- 5.8)
13. Single-step growth of pyramidally textured NiO nanostructures with improved supercapacitive properties, **International Journal of Hydrogen Energy**, 2017, 42, 6080-6087. (I.F.- 5.8)
14. A room temperature hydrogen sensor based on Pd-Mg alloy and multilayers prepared by magnetron sputtering, **International Journal of Hydrogen Energy**, 2015, 40, 15549-15555. (I.F.- 5.8)
15. Influence of barrier inhomogeneities on transport properties of Pt/MoS_2 Schottky barrier junction, **Journal of Alloys and Compounds**, 2019, 797, 582-588. (I.F.- 5.3)
16. Multifunctional Behavior of acceptor-cation substitution at higher doping concentration in PZT ceramics, **Ceramics International**, 2019, 45, 12716-12726. (I.F.- 4.5)
17. Linear and nonlinear optical investigations of N:ZnO/ITO thin films system for opto-electronic functions, **Optics and Laser Technology**, 2019, 112, 539-547. (I.F.- 3.9)
18. Silicon carbide nanocauliflowers for symmetric supercapacitor devices, **Industrial & Engineering Chemistry Research**, 2016, 55, 9452-9458. (I.F.- 3.7)
19. Investigation of structural, optical and vibrational properties of highly oriented ZnO thin film, **Vacuum**, 2018, 155, 662-666. (I.F.- 3.6)
20. Fast response ammonia sensors based on TiO_2 and NiO nanostructured bilayer thin films, **RSC Advances**, 2016, 6, 77636-77643. (I.F.- 3.4)
21. Highly sensitive and selective CO gas sensor based on hydrophobic SnO_2/CuO bilayer, **RSC Advances**, 2016, 6, 47178-47184. (I.F.- 3.4)
22. Porous silicon filled with Pd/WO_3-ZnO composite thin film for enhanced H_2 gas-sensing performance, **RSC Advances**, 2017, 7, 39666-39675. (I.F.- 3.4)
23. Sputter deposited chromium nitride thin electrodes for supercapacitor applications, **Materials Letters**, 2018, 220, 213-217. (I.F.- 3.4)
24. One-step sputtered titanium nitride nano-pyramid thin electrodes for symmetric super-capacitor device, **Materials Letters**, 2019, 245, 142-146. (I.F.- 3.4)
25. All-transparent NO_2 gas sensor based on free-standing Al doped ZnO nanofibers, **ACS Applied Electronic Materials**, 2019, 1, 1261-1268. (I.F.- 3.3)
26. Defects induced photoluminescence and ellipsometric measurements of reactive sputtered growth MoS_2 nanoworms, **Optical Materials**, 2021,113, 110848. (I.F.- 3.1)
27. Experimental evidence of spin glass and exchange bias behavior in sputtered grown α-MnO_2 nanorods, **Journal of Magnetism and Magnetic Materials**, 2017, 433, 227-233. (I.F.- 3.0)
28. A structural, morphological, linear, and nonlinear optical spectroscopic studies of nanostructured Al-doped ZnO thin films: An effect of Al concentrations, **Journal of Materials Research**, 2019, 34, 1309-1317. (I.F.- 3.1)
29. Influence of interparticle interaction on the structural, optical and magnetic properties of NiO nanoparticles, **Physica B: Condensed Matter**, 2019, 552, 88-95. (I.F.- 2.4)
30. Performance of high energy density symmetric supercapacitor based on sputtered MnO_2 nanorods, **ChemistrySelect**, 2016, 1, 3885-3891. (I.F.- 2.1)
31. Sputter-Grown Pd-Capped CuO Thin Films for a Highly Sensitive and Selective Hydrogen Gas Sensor, **Journal of Electronic Materials**, 2021, 50, 192-200. (I.F.- 1.9)
32. Determination of optical constants including surface characteristics of optically thick nanostructured Ti films: analyzed by spectroscopic ellipsometry, **Applied Optics**, 2016, 55, 8368-8375. (I.F.- 1.9)
33. Highly Sensitive NiO nanoparticle-based chlorine gas sensor, **Journal of Electronic Materials**, 2018, 47, 3451-3458. (I.F.- 1.9)
34. Effect of annealing temperature on structural and optical properties of Sol-Gel-derived ZnO thin films, **Journal of Electronic Materials**, 2018, 47, 3678-3684. (I.F.- 1.9)
35. Hydrogen sensing properties of nanostructured Pd/WO_3 thin films: role of hydrophobicity during recovery process, **Materials Research Express**, 2014, 035046. (I.F.- 1.6)

Conference Publications

1. Nanostructured wear resistant coating for reversible cultivator shovels: An experimental investigation, AIP Conference Proceedings, 2016, 1724.
2. Enhanced optical absorbance of hydrophobic Ti thin film: role of surface roughness, Advanced Materials Letters, 2016, 7, 485-490.
3. Influence of thickness on structural, electrical and optical properties of DC sputtered Mo back contact for solar cell application, Advanced Materials Letters, 2016, 7, 100-105.
4. Sputtered nanostructured single crystalline Cu doped ZnO thin films for carbon monoxide gas sensing applications, Advanced Materials Letters, 2018, 3, 312-317.
5. Sputtering pressure dependent structural, optical and hydrophobic properties of DC sputtered Pd/WO_3 thin films for hydrogen sensing application, Emerging Energy Technology- A Sustainable Approach, 2014, 146.

Conference & Workshop Attended

1. Oral presentation in 5th International Conference on Electronic Materials and Nanotechnology for Green Environment at Jeju, South Korea (November 11-14, 2018)

2. Oral presentation in 13th Winter Conference of Korea Materials Organization Society at Gangwon-do, South Korea (January 22-24, 2018).
3. The 7th Sungkyun International Solar Forum (SISF). Halide Perovskites: Photovoltaics and Beyond. Sungkyunkwan University (SKKU), Seoul, Korea. June 27-29, 2018.
4. IEEE Short course on Nanotechnology Journey from Quantum Physics to Nanoengineering at IIT Roorkee (April 2, 2014).
5. Poster presentation in 6th India-Singapore Joint Physics Symposium on Physics of Advanced Materials at Indian Institute of Technology Kharagpur, India (February 25-27, 2013).
6. Workshop on Nano Drug Delivery Systems at IIT Roorkee (January 10, 2015).
7. INUP workshop on Nanofabrication Technologies at IIT Roorkee, (April 27-28, 2017).
8. Workshop on Formulation of Smart Nanodevices at IIT Roorkee, (February 2-3, 2013).
9. National Education Summit at Gandhinagar, Gujrat, (January 10-11, 2014).

Research Highlight in News

Scientists design silicon-based nanocauliflowers to detect hydrogen. Research Matters, 2017.

Book/Book Chapter

1. Nanostructure Thin Films for Gas Sensor and Supercapacitor Applications, by Amit Sanger, 2019, Lambert Academic Publishing, ISBN 978-613-9-91957-4.

2. Science, Technology and Advanced Applications of Supercapacitors - 'Sputtered chromium nitride thin electrodes for supercapacitor applications' by Mohd Arif, Amit Sanger, Arun Singh, 2018, IntechOpen, ISBN 978-953-51-7034-1.

References

1. Dr. Yogendra Kumar Mishra
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