

Prof. (Dr.) Sonia

Professor, Department of Physics

J. C. Bose University of Science and Technology, YMCA
Faridabad PIN-121006 INDIA

+91 90131 62800
soniabansal@jcboseust.ac.in



AT PRESENT

Chairperson Department of Physics

Director, Industrial Affairs

Deputy Dean Student Welfare

J. C. Bose University of Science and Technology, YMCA, Faridabad 121006 INDIA.

EDUCATION

- 2022 **PhD, Computer Science,** Jawahar Lal Nehru University, New Delhi.
Title: Efficient Clustering Approaches for Organizing Document Collection
- 2004 **PhD, Physics,** Jamia Millia Islamia, New Delhi.
Title: Spectroscopic Studies of Buckminsterfullerenes
- 2007 **MTech, Computer Engg. (72.03%) (67.60%),** Maharishi Dayanand University, Rohtak, Haryana.
- 2004 **MCA, (DES) (74%),** Maharishi Dayanand University, Rohtak, Haryana.
- 1999 **MSc, Physics (71.2%),** Department of Physics, Jamia Millia Islamia, New Delhi.
- 1997 **CIC (Certificate in Computers (DES)) (74%),** IGNOU, New Delhi.
- 1997 **BEd (63.05%),** Maharishi Dayanand University, Rohtak, Haryana.
- 1996 **BSc (66.4%),** Maharishi Dayanand University, Rohtak, Haryana.

RESEARCH LAB DEVELOPMENT

- 2017 Nano Research Laboratory - **SUKSHAM (Cost: 85 Lacs)**
DST-Haryana Grant and UGC Funding for Research
Lab status : E113, Ground Floor – Main Building (Fully Functional)

SPONSORED/RESEARCH PROJECTS

- 2024-27 **HSCSIT, DST Haryana** (Duration: 3-Years) (Ongoing)
Design and Development of Nano Antenna Sensor System for real time analysis
Grant: **INR 40,00,000/-**
- 2022-24 **HSCSIT, DST Haryana** (Duration: 2-Years) (Ongoing)
Development of Biomass Derived Activated Carbon for Electrode materials in Energy Storage application
Grant: **INR 32,80,000/-**
- 2016-18 **HSCSIT, DST Haryana** (Duration: 2-Years) (Completed)
Study of Structural and Optical properties of Metal-doped Zinc Oxide (ZnO) Films for Optoelectronic Devices
Grant: **INR 8,83,883/-**
- 2016-18 **Under UGC Research Grant to the University** (Duration: 2-Years) (Completed)
Deposition of AZO thin films by Sol-Gel process and its Characterization for Development of Sensors
Grant: **INR 1,00,000/-**
- 2016-18 **Under UGC Research Grant to the University** (Duration: 2-Years) (Completed)
Development of Solar Water Disinfection System (SODIS)
Grant: **INR 1,00,000/-**

SELECTIVE PUBLICATIONS

- 2005 Electronic Absorption Spectra of C60 and C70 and their Interpretation, International Journal on Canadian **JOURNAL OF ANALYTICAL SCIENCES AND SPECTROSCOPY, 2005**, 50(1), 1-6.
- 2011 C60 and C70 Electronic Absorption Spectra in Different Solvents and Matrices **JOURNAL OF BIOMEDICAL NANOTECHNOLOGY, 2011**, 7, 199-201.
- 2018 Effect of dispersion on omnidirectional reflection band in zinc oxide-based one-dimensional photonic crystal heterostructures **JOURNAL OF NANOPHOTONICS, 2018**, 12(2), 026121-16
- 2018 Device Applications of Metal-2D-Materials Interfaces: A Short Review **EUROPEAN JOURNAL OF ENGINEERING RESEARCH AND SCIENCE, 2018**, 3(4), XX.

- 2018 Review Article: Electrochemical Atomic Layer Deposition (EC-ALD) Low Cost Synthesis of Engineered Materials a Short Review,
[ADVANCES IN MATERIALS SCIENCE AND ENGINEERING](#), **2018**, 2(1), 1-20.
- 2019 Effect of anisotropy on the spectral characteristics of one-dimensional porous silicon photonic crystal microcavity for optical sensing applications
[EUROPEAN JOURNAL OF NANOPHOTONICS](#), **2019**, 13(1), 016012.
- 2020 Effect of substrate rotation speed on structural, morphological, vibrational and optical properties of sol-gel derived Mn-Ni co-doped ZnO thin films
[MATERIALS TODAY: PROCEEDINGS](#), **2022**, 49(8), 3008-3014.
- 2020 Structural, raman, photo-luminescent and optical investigation of sol-gel derived Co, Al and Ni doped ZnO thin films
[MATERIALS TODAY: PROCEEDINGS](#), **2022**, 49(8), 3022-3027
- 2021 Room Temperature Synthesis of Colossal Magneto-Resistance of La_{2/3}Ca_{1/3}MnO₃: Ag_{0.10} Composite
[ECS JOURNAL OF SOLID STATE SCIENCE AND TECHNOLOGY \(IOP PUBLISHING LIMITED\)](#), **2021**, 10(2), 027006.
- 2022 Low-cost inkjet-printed humidity sensor using nanoporous surface on coated paper
[JOURNAL ARTICLE ON SENSORS AND ACTUATORS: B CHEMICALS](#), **2022**, 370(5), 132389
- 2023 Flexible Graphite-Based Humidity Sensor Using Green Technology
[ECS SENSORS PLUS](#), **2023**, 1(4), 044401.
- 2023 Effect of Annealing Temperature on Excitonic Binding Energy and Other Optical Properties of Mn-Ni Co-Doped Transparent ZnO Thin Films
[TRANSACTIONS OF THE INDIAN CERAMIC SOCIETY](#), **2023**, 82(1), 31-39.
- 2024 Waste biomass-derived activated carbons for various energy storage device applications: A review
[Journal of Energy Storage](#), 2024, 78(1), 109996.
- 2024 Review of MXenes and their composites for energy storage applications
[Journal of Energy Storage](#), 2024 87, 111420

BOOK CHAPTER(S)

- 2021 Chapter Title: '**Zinc Based Metal Organic Framework for Heavy Metal Sensing**'
 Book: 'Metal Organic Frameworks for Environmental Sensing'
 Author(s): Afsana Khan, Mamta Giri, Kalpna, Smita S. Kumar and **Sonia Bansal**, 2021, Chapter 7, pp 177-201
[ACS Symposium Series Vol. 1394](#)
- 2022 Chapter Title: '**Development of paper biosensors using enzyme immobilized nanostructures using printing electronics**'
 Book: 'Multifaceted Bio-Sensing Technology'
 Author(s): Afsana Khan, Amir, Smita S. Kumar, and **Sonia Bansal**, 2022, Chapter 12, 199-216 [Elsevier](#)
- 2024 Four Chapters Accepted in [ACS Book](#)

TEACHING EXPERIENCE (19+ years)

- **UG**
 - Engineering Physics (Semester I/II)
 - Electrical Circuits and Network Skills
 - Waves and Optics
- **PG**
 - Fundamentals and Synthesis of Nanomaterials
 - Laser Technology
 - Nano Science and Nano Technology
 - Quantum Mechanics
 - Atomic and Molecular Physics
 - Fundamentals of Computer Programming in C/ C++
- **PhD**
 - Nanostructure Materials and Its Applications
 - Nanostructure Materials and Devices
 - Nano Materials and Characterization

RESEARCH GUIDANCE

- **PhD Supervision (Completed : 03)**
 - **Mr. Vinod Chackoo** (2021)
 - *Modeling and Optimization of 1-D Photonic Crystal Wave Guides and Devices*
 - **Mr. Shital Prasad** (2022)
 - *Study of effects of Doping on Nano-Structural ZnO Thin Film*
 - **Mr. Rajeev Sindhu** (2013) (Co-Supervisor)
 - *Experimental and Theoretical Spectroscopic studies of some Coumarin dyes and its derivatives*
- **PhD Supervision (Ongoing: 04)**
 - **Amir Mansoori** (Since Aug 2017)(Co-supervisor)
Design and Fabrication of Low Cost Printed Sensors using 2D materials
 - **Ms. Afsana Khan** (Since Aug 2018)
Fabrication and Characterization of Two-Dimensions Layered Materials for Printed Electronic Devices
 - **Ms. Priyanka** (Since Aug 2020)
Design, Fabrication and Testing of Patch Antenna Sensors
 - **Ms. Poonam** (Since Jan. 2024)
Design, Fabrication and Testing of Patch Antenna Sensors
- **M.Tech. Thesis** Completed: 11
- **PG Dissertations** Completed: 69

ACADEMIC ACTIVITIES

- **Development of MOOCs: 40**
Development of MOOC on Fundamentals of Nanoscience and Nanotechnology, approved under CEC, UGC, New Delhi for SWAYAM Portal vide letter no: CEC/AD/AAC/MOOCs/2022 dated 18th Aug. 2022.
- Delivered the lectures module on **EDUSAT network through VYAS Channel** on Higher Education Satellite Channel of MHRD/ DD Direct Plus, a DTH platform of Doordarshan and Dish TV, a private DTH operator e-learning material or module (Online) at Consortium for Educational Communication (CEC) under Inter–University Centre of UGC, New Delhi: **Total 145**
- Conferences/Workshops/Symposium/Expert lecture/Seminar organized as Convener: **40**
- STC/ Conferences/Workshops/Orientation Course/Refresher Course Attended: **50**

SPONSORSHIP RECEIVED FOR ACTIVITIES [RS. 35 Lacs]

- **Science Conclave**
 - 5 Lacs (2013), 5 Lacs (2014), 10 Lacs(2017), 5 Lacs (2022) from DST, Haryana.
 - 2 Lacs (2017) from Department of Technical Education, Haryana
- **National Conferences**
 - **RSTTMI-16:** 3 Lacs from Science Congress Association (ISCA), Kurukshetra Chapter, 50K from DST, Haryana & 50K from DRDO, Delhi
 - **National Conference** on Role of Meghnad Saha in the Growth of Physics(2019): 50K from Vigyan Prasar, Noida
- **National Science Day**
 - 50K (2021)
- **International Conference(IASTSF-22) on National Science Day(2022)**
 - 50K from DST, Haryana
- **International Conference(RAST2024)**
 - 50K from DST, Haryana

WORKSHOP, SEMINAR AND CONFERENCES ATTENDED

- National/ International Conferences Presented /Invited Lectures: 74

SELECTIVE CONFERENCES

- 2015 International Annual Conference on Business Research and Management Practices in Global Environments from at Alliant School of Management, **Alliant International University, San-Diego, USA**, 2 -3 April 2015.
- 2017 2nd International Nanotechnology Conference & **Expo at Dubai, UAE**, 3 -5 April 2017.
- 2021 International Webinar on Formulation and Characterization of Materials & Their Broad Applications for Sustainable Environment and Therapeutics in Department of Chemistry, Jamia Millia Islamia, New Delhi under the aegis of **MHRD SPARC Scheme**, 1-2 March 2021.

MEMBERSHIPS

- Life time member of Materials Research Society of India (MRSI) [LMB – 1761]
- Senior member, International Association of Computer Science and Information Technology [80341434]
- Life time member of Indian Nano-Science Society [LM-042]
- Life time member of National Environmental Science Academy (NESA) [356]
- Life Member of Institution of Engineers, India [M1527007]
- Life Member of Indian Science Congress, India [L28701]
- Member of Bhartiya Shikshan Mandal
- Secretary, Women Connect YMCA MOB
- Vice President Staff Club
- Member in Prant Samaprk Team

ADDITIONAL RESPONSIBILITIES

- Deputy Dean Student Welfare (Since Dec. 2022)
- Event Coordinator, Research and Development Cell (Since Dec. 2022)
- Member of research project committee (Since Aug. 2022)
- Member of Academic Council (AC) of the University (2015-2017), (2020-2022)
- Worked as Deputy Dean Student Welfare (Aug. 2016 to Aug. 2020)
- Worked as member of University Central Purchase Committee (March 2019 to March 2020)
- Worked as Girls Hostel Warden (Jan. 2015- Feb. 2019)
- Member of University Purchase Committee (2019-20, 2024-25)
- Coordinator of UG course in Physics (2018)
- Member of University Grievance Committee (2012-2018)
- Member of BOS and BOF of Faculty of Sciences (Since 2012)
- Member of BOF of Faculty of Interdisciplinary at JC Bose UST, YMCA (2021-2023)
- Member of NAAC Committee (2017,2022)
- Member of Convocation Committee (2017,2023)
- Member of Departmental Research Committee (Since 2016)
- President Cultural (Aug. 2015 to Aug. 2016)
- Worked as Member of University Annual Report Committee & member of Moderation Committee
- Time Table Coordinator, Website Coordinator, CBS Examination Coordinator, Purchase Committee etc.
- Incharge of HAS Department (in Vacation) (July 2018, 17,16)
- Member of admission committee of B.Tech, B.Sc., M.Sc. & Ph.D. (Since 2007)
- Coordinator of Srijan Club (2011 to Aug. 2015)
- Member of University result preparation team in CEO Office (Examination Branch) 2013-2015)
- Member of Academic Council of Central University, Himachal(2023-25)