

Dr. Sonia

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AT PRESENT

2022 **Professor**, Department of Physics (Jan. 2022 - till date)
J. C. Bose University of Science and Technology, YMCA, Faridabad 121006 INDIA.

EDUCATION

PhD, Computer Science, Jawahar Lal Nehru University, New Delhi.
Title: Efficient Clustering Approaches for Organizing Document Collection

PhD, Physics, Jamia Millia Islamia, New Delhi.
Title: Spectroscopic Studies of Buckminsterfullerenes

MTech, Computer, Maharishi Dayanand University, Rohtak, Haryana.

MCA, (DES), Maharishi Dayanand University, Rohtak, Haryana.

MSc, Physics, Department of Physics, Jamia Millia Islamia, New Delhi.

CIC (Certificate in Computers (DES)), IGNOU, New Delhi.

BEd, Maharishi Dayanand University, Rohtak, Haryana.

BSc, 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

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.

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](#)

TEACHING EXPERIENCE (18+ 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: 03)**
 - **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
- **MTech Thesis** Completed: 11
- **PG Dissertations** Completed: 65 Ongoing: 04

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 125**
- 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) and 50K (2022) from DST, Haryana

WORKSHOP, SEMINAR AND CONFERENCES

- National/ International Conferences Presented /Invited Lectures: **72**

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

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 (2019-2020)
- 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 JCBoseUST, 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)

OTHER (MISC.)

- Member of Academic Council of Central University(2023)