Dr. Ashwani Kumar
Assistant Professor (Ad-hoc)
Department of Physics
GGDSD COLLEGE Chandigarh
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DOB: 5th July 1982

Educational Qualifications

Ph.D. in Physics
Department of Physical Sciences, Panjab Technical University Jalandhar, India (2020) PhD Thesis: *Development of Perovskite Solar Cell*, Ph.D. Supervisor: Dr. K.L. Singh, Dr. S.K. Tripathi
Qualified U. G. C. (J. R. F.) in Economics

- **CSIR-UGC NET qualified 2016**

M.Tech. (Nanoscience & Nanotechnology) Department of Physics, Panjab University Chandigarh, India (2008-2010)
M.Sc. (Physics) - Department of Physics, Bundelkhand University Jhansi, India (2005-2007)
Bachelor of Science (N.M.) Govt. Degree College Hamirpur, Himachal Pardesh (2000-2003)

Teaching/Research Experience

- 01 August 2017- till date (On Ad-hoc)
  Assistant Professor in Department of Physics, GGDSD College, Chandigarh. Taught Quantum Mechanics, and Experimental techniques at Postgraduate level, Electronics, Laser and Optics, Applied mechanics, Nuclear and Particle Physics at graduate level.

Areas of Interest

- Solar cells, Thin Films, Metal Oxides, Luminescent Materials.

Publications (Journal/Book Chapters)

Journal Publications:

Year 2015-16

1. Dual mode emission in NaYF4: Yb Er nanorods for photovoltaics application. A Kumar, S Kant Tripathi, A D Deshmukh Advanced Materials Letters 6 (8), 2015, 701-705

Year 2019-20

1. Binary metal zinc-lead perovskite built-in air ambient: Towards lead-less and stable perovskite materials N Soleimanioun, M Rani, S Sharma, A Kumar, SK Tripathi Solar Energy Materials and Solar Cells 191, 2019, 339-344. (IF-6.3)

Year 2020-21

1. An impact of La doping content on key physical properties of PbS spherical nanoparticles facilely synthesized via low temperature chemical route M Shkir, KV Chandekar, T Alshahrani, A Kumar, A Khan, S AlFaify The European Physical Journal Plus 135 (10), 2020, 816. (IF-3.4)
2. Novel rare earth Dy doping impact on physical properties of PbI2 nanostructures synthesized by microwave route for optoelectronics KV Chandekar, A Khan, T Alshahrani, M Shkir, A Kumar, AM El-Toni, ...Materials Characterization 170, 2020, 110688. (IF-4.7)
3. A novel terbium doping effect on physical properties of lead sulfide nanostructures: a facile synthesis and characterization M Shkir, KV Chandekar, T Alshahrani, A Kumar, S AlFaify Journal of Materials Research 35 (20), 2020, 2664-2675. (IF-3.72)
4. A facile microwave synthesis of Cr-doped CdS QDs and investigation of their physical properties for optoelectronic applications M Shkir, ZR Khan, KV Chandekar, T Alshahrani, A Kumar, S AlFaify Applied Nanoscience 10 (10), 2020, 3973-3985

5. Microwave-assisted synthesis of Mg: PbI2 nanostructures and their structural, morphological, optical, dielectric and electrical properties for optoelectronic technology M Shkir, ZR Khan, T Alshahrani, KV Chandekar, MA Manthrammel, Chinese Physics B 29 (11), 2020, 116102. (IF-1.7)
6. Effect on Morphology and Optical Properties of Inorganic and Hybrid Perovskite Semiconductor Thin Films Fabricated Layer by Layer. A Kumar, KL Singh, SK Tripathi Journal of Nanoscience and Nanotechnology 20 (6), 2020, 3832-3838. (IF-1.3)
7. Effects of Thermal Annealing Duration on the Film Morphology of Methylamine Lead Triiodide (MAPbI3) Perovskite Thin Films in Ambient Air. A Kumar, N Soleimanioun, N Singh, KL Singh, IS Sandhu, SK Tripathi Journal of nanoscience and nanotechnology 20 (6), 2020, 3795-3801. (IF-1.3)

Year 2021-22

1. A Kumar, M Shkir, KL Singh, SK Tripathi. Exploring the impact of HgI2 doping on optical, structural and morphological properties of pure CH3NH3PbI3 perovskite. Inorganic Chemistry Communications 132, 2021, 108851(IF-4.4)
2. M. Shkir, ZR Khan, MA Sayed, KV Chandekar, A Khan, A Kumar, M. A Jowhari, S AlFaify. Effect of Er doping on linear and nonlinear optical properties of NiO films. Chinese Journal of Physics 72, 2021, 547-557 (IF-5)
3. Effect of Mn-adding on microstructure, optical and dielectric properties Zn0. 95Al0. 05O nanoparticles. R Kant, R Singh, A Bansal, A Kumar. Physica E: Low-dimensional Systems and Nanostructures 131, 2021, 114726. (IF-3.3)

Year 2022-23

1. T. Ghabara, H.E. Ali, A. Kumar, I.M. Ashraf, M. Shkir, and Y. Khairy. Development of novel flexible photodetectors based on 0.5PVA/0.5PVP/Fe:NiO nanocomposite system with enhanced optoelectronic properties. New J. Phys. 24, 2022, 123029. (IF-3.3) ISSN: 1367-2630
2. A. Kumar, Mohd. Shakir, H.H. Somaily, K.L. Singh, B.C. Choudhary, S.K. Tripathi, A simple, low-cost modified drop-casting method to develop high-quality CH3NH3PbI3 perovskite thin films. (2022) Physica B: Condensed Matter, 630, 2022, 413678 (IF-2.8) ISSN 0921-4526.

Year 2023-24

1. Ashwani Kumar, SK Tripathi, Mohd Shkir, A Alqahtani, S AlFaify. Prospective and challenges for lead-free pure inorganic perovskite semiconductor materials in photovoltaic application: A comprehensive review. Applied Surface Science Advances. 18, 2023, 100495 (IF-7.5)
2. A.B.G. Trabelsi, F.H. Alkallas, K.V. Chandekar, A. Kumar, M. Ubaidullah, M. Shkir, M.A. Manthrammel, S AlFaify. Facile lo w temperatur e developmen t of Ag -doped Pb S nanoparticles for optoelectronic applications. Materials Chemistry and Physics. 297, 2023, 127299 (IF-4.6)

Year 2024-25

1 Ashwani Kumar, S.K. Tripathi, Mohd. Shkir, S. AlFaify, T. Srilavanya. Processing methods towards scalable fabrication of perovskite solar cells: A brief review. Inorganic Chemistry Communications 169, 2024, 113115 (IF-4.4)
2 Ashwani Kumar, Anuj Kumar, Mohaseen S Tamboli, Mohd Ubaidullah, J Jayarubi, SK Tripathi. A modified drop-casting technique for efficient lead-free, environment-friendly thin film CsBi3I10 perovskite solar cells. Physica B: Condensed

Matter.672, 2024, 415426. (IF-2.80)

3 P. Diana, S. Sebastian, D. Sivaganesh, M. Aslam Manthrammel, Ashwani Kumar, Mohd Shkir. Hydrothermal synthesis of cerium-doped Zn2SiO4 phosphor for futuristic lighting applications. Journal of Solid State Chemistry. 329, 2024, 124441 (IF-3.2)

Year 2025-26

1. Comparative study of pure and chromium-doped nickel oxide nanoparticles synthesized by combustion synthesis for optoelectronic applications. M.A. Sayed, Ashwani Kumar, Kamlesh V. Chandekar, Mohd Shkir. Materials Chemistry and Physics. 332, 2025, 130150
2. Improved gas sensing capabilities of ZnO:Er nanoparticles synthesized via co-precipitation method. R. Balaji, Pandurangan Mohan, S. Vinoth, Ashwani Kumar, Thamraa Alshahrani & Mohd. Shkir. Journal of Sol-Gel Science and Technology, 2025, 1-14
3. Design and fabrication of enhanced room temperature NH3 sensors based on Sn-doped WO3 thin films deposited using nebulizer spray pyrolysis technique. S. Vinoth, Inigo Valan Isaiarasu, R.S. Rimal Isaac, A. Vimala Juliet, Aayesha Sagir Khan, Ashwani Kumar, Mohd Shkir. Ceramics International, 2025.

Book Chapters:

2025-2026

1. Nanostructured Metal Oxides for Energy Harvesting and Storage Devices. By Jyoti Bala, Mohd Shkir, Ashwani Kumar. Book: Emerging Materials for Energy and Sensing. CRC Press. https://www.taylorfrancis.com/chapters/edit/10.1201/9781032673691-5/nanostructured-metal-oxides-energy-harvesting-storage-devices-jyoti-bala-mohd-shkir-ashwani-kumar

2024-2025

Chapter 14. 2D Metals for Fuel Cells. By **Ashwani Kumar**, Jyoti Bala, Mohd Shkir. (Online aviliable). https://www.taylorfrancis.com/books/edit/10.1201/9781032645001/2d-metals-ram-gupta

Seminars/ Conferences/Symposiums (Paper Presented)

- A novel solution combustion method for tertiary Cu and Zn doped NiO nanocomposite for evaluation of its photocatalytic activities of methylene blue dye degradation. In International Conference On International Conference on Engineered Materials for Sustainable Development, EMSD 2024 held at PEC Chandigarh.
- Thin Film of Two Different Perovskite Precursor as Light Harvesting Enhancers in Perovskite Absorbing Layer. In International conference on thin films (ICTF-2017) held at NPL New Delhi.
- Perovskite Solar Cells, A Step Towards Solar Future. In the international conference ICMTech-2016 at Delhi University. (BEST POSTER AWARD)
- Nobel Lumeniscent features of NaYF4 doped with rare earth In the 6th International Conference on Nano Science and Technology (ICONSAT 2014) held at Panjab Univ. Chandigarh.
- Syntheses and characterization of Rare earth doped NaYF4 and YOCl upconversion phosphor material. International conference on Advances in Condensed & Nano Materials held at Panjab Univ. Chandigarh. http://physics.puchd.ac.in/icacnm2011 (BEST

POSTER AWARD) (2011)

- Luminescence study of NaYF4:Yb,Tm/Er Upconversion Nanophosphor. in International conference on Nanotechnology and Laser Induced Plasma (IRNANO) held at Delhi university 24 -26 November 2009. New Delhi.
- "Advanced Material Processing & Characterization" Under the ages of ACS. Coordinated the conference on 27th May 2016.
- Synthesis and characterization of carbon nanotubes by arc discharge method. In Green Nanotechnology 2016, held in Chandigarh Univ. on 15-16 November 2016.
- 4th National seminar on Recent Advances in Materials Science RAMS 2022. Held in GGDSD College Chandigarh on 01 February 2020.
- Perovskite solar cells could be the future of energy. In 5th National seminar on Recent Advances in Materials Science RAMS 2022. Held in GGDSD College Chandigarh on 30 September 2022.

Refresher Courses/Workshops/ Training Programmes

- Challenges and Opportunity in Nanotechnology" in NITTTR Chandigarh. 07-05-2012 to 11-05-2012
- Workshop on "Advanced functional materials" in PEC Chandigarh. March 17, 2018.
- Innovative Experiments in Physics. GGDSD College Chandigarh. March 30, 2019.
- Online Workshop on Rietveld Refinement Method. Organized by UGC-DAE Consortium for Scientific Research Mumbai Centre in association with Indore Centre.
- One Week Faculty Development Program on Blockchain Technology. Conducted by Electronics & ICT Academy, IIT Roorkee at PMLSD Business School, Chandigarh on 20-24 January 2020.
- Predictive Analysis using IBM SPSS Modeler-Advanced Course. Two week course from 19 December to 30 December 2022.

Invited Talks

- NIL

Projects

- NIL

MOOCS/Online Content

- NIL

M. Phil Dissertation Supervised

NIL

PhD Thesis

NIL

Administrative Experience

- One year as an administrative officer in Chandigarh University Gharuan Mohali.

Membership of Economic Associations

- NIL

Dr. Ashwani Kumar