

Detailed Profile (Dr. Rachna)

Personal Information:

Name of the Faculty – Dr. (Mrs.) Rachna Ahlawat

Department – Physics

Designation – Associate Professor

Office Address – Raman No: 08, Department of Physics, Raman Bhawan, Ch. Devi Lal University, Sirsa-125055 (Haryana), India



Contact Information:

Office No – 01666-239835

E-mail – dr.rachna@cdu.ac.in, rachnaahlawat2003@yahoo.com

Educational Qualification:

- Ph. D. – (2014) Deptt. of Physics, Ch. Devi Lal University, Sirsa-125055, Haryana
- NET (JRF) – (June 2007) CSIR-UGC
- M.Sc. – (2006) Ch. Devi Lal University, Sirsa-125055, Haryana
- B.Sc. (Non-Medical) – (2004) M.D.U., Rohtak-124001, Haryana

Teaching Experience (~14.5 Yrs):

- Associate Professor, Deptt. of Physics, Ch. Devi Lal University, Sirsa-125055, Haryana (22 August 2021 - till date)
- Assistant Professor (Reader/Selection Grade, Stage-III) Deptt. of Physics, Ch. Devi Lal University, Sirsa-125055, Haryana (22 August 2018- 21 August 2021)
- Assistant Professor (Senior Scale, Stage-II,) Deptt. of Physics, Ch. Devi Lal University, Sirsa-125055, Haryana (22 August 2013-21 August 2018)
- Assistant Professor (Stage-I), Deptt. of Physics, Ch. Devi Lal University, Sirsa-125055, Haryana (22 August 2007-21 August 2013)

Area of Interest (Teaching):

- Nanoscience and Nanotechnology, Atomic and Molecular Physics
- Fundamental of Electronics, Fiber Optics and Optoelectronic Devices
- Advanced Electronics, Solid State Physics
- Material Science, Research Methodology

Area of Interest (Research):

My interests are on problems that are at the interface of Physics, Chemistry, Materials, and Engineering with a major focus on the synthesis of smart nanomaterials. The ultimate goal is to gain an understanding of structure-property relationships and to engineer materials with desired functionality for photovoltaic, light-emitting, gas-sensing applications, optical amplifiers, healthcare, environmental, and energy sectors. Research goals include, but are not limited to:

- Material Physics: Metal Oxides, Binary Composites, Photocatalysis,
- Optical Nanomaterials: Photoluminescent materials, Quantum Dots
- Functional Nanoceramics: Heat treatment, Nanomaterials-Composites
- Glass-Ceramics, Semiconducting Materials,

Research Skills & Expertise:

(Nanomaterials: Synthesis, Characterization, and Applications)

Synthesis Methods – Sol-Gel, Co-precipitation, Combustion, and Solid-State Method

Structural Analysis – XRD, FTIR, EDX, XPS, and Raman Spectroscopy.

Morphological Analysis – FESEM, EDS, TEM/HR-TEM, and AFM.

Optical properties – UV- Vis absorbance, Reflectance, Fluorescence, Decay, CIE, and PL.

Electrical properties analysis: – Four-Probe methods with or without magnetic fields.

Thermal Properties – DTA, TGA, and DSC.

Awards & Honors:

- Appreciation award in International Conference for oral presentation ICPBEC-2021
- Award of Honor for the Enrichment of Academics and Research in CDLU (26 Jan 2019)
- Award of Honor for the Enrichment of Academics and Research in CDLU (05 Sept 2019)
- Gold Medalist in M.Sc. (June 2006)
- Best Girl Student during M. Sc (2005)

Administrative Experience:

- Member of Court, CDLU Sirsa (2021-2023)
- Member of Academic Council, CDLU Sirsa (2019-2021)
- Member of Faculty of Physical Science (2014-16)
- Member of Under Graduate Board of Studies 'UGBOS&R' in Physics
- Member of PGBOS&R in Physics
- Incharge (Warden) of Girl Hostel-III (2019-20)
- Convener of DPC-GH-III (2019-20)
- Polling Officer for Student Election (held on 17.10.2018)
- Member of Committee for Ph.D. Information Brochure (Nov 2017)
- Co-coordinator for Physics Models in Science Conclave-16
- Co-coordinator of Material Science Lab, Deptt. of Physics
- Co-coordinator of Optical Fiber & Optoelectronic Devices Lab, Deptt. of Physics
- Member of Physical Society, DRC, Staff Council, DPC, Time-Table, Syllabus Enrichment, and Admission committees in Department of Physics
- Member of Inspections Team for various colleges constituted by CDLU authority
- Member of many Complaints Committees constituted by CDLU authority
- Member of Flying Squad during examinations
- Member of UMC committee constituted by CDLU authority
- Member of many committees in Youth Festivals held in CDLU
- Member of Panel of Judges for the various Talent Search Programs
- Convener of the Physical Society in Department of Physics (2013-14)
- Member of University Teaching Association, CDLU
- Member of "Student Grievance Redressal Cell"

Conference/ Workshops/Seminars Organized:

- National Conference on Emerging Trends in Physics and Material Science (ETPMS-2015) held on March 09-10, 2015 at Deptt. of Physics (Organizing Secretary)
- National Conference on Emerging Trends in Physics and Material Science (ETPMS-2016) held on March 19-20, 2016 at Deptt. of Physics (Organizing Secretary)

Peer Recognition for Reputed Journals:

- Journal of Alloys and Compounds (Elsevier)
- ‘Silicon’ (Springer)
- Material Science: Materials in Electronics (Springer)
- Inorganic and Nano-Metal Chemistry (Taylor & Francis)
- Journal of Nanostructure in Chemistry (Springer)
- Molecular Simulator (Taylor & Francis)
- Materials Science & Engineering B (Elsevier)
- International Journal of Hydrogen Energy (Elsevier)
- Applied Physics A (Springer)
- Journal Optoelectronics and Advanced Materials (INOE Publishing House)

Citations & Profile Links:

- Total Publications – 67 (Journal articles: 43; Proceedings: 19; Book Chapters: 05)
- Total Impact Factor of Publications – 125
- Google Scholar – h-index: 9; i-10 index: 8; Citations: 210
- (<https://scholar.google.com/citations?hl=en&user=v75pfUsAAAAJ>)
- Scopus – h-index: 9; Citations: 171
- (<https://www.scopus.com/authid/detail.uri?authorId=55816906000>)
- Web of Sciences – h-index: 9; Citations: 154
- (<https://publons.com/researcher/2474987/rachna-ahlawat/>)

Research Guidance (M. Phill): 02

- Bindiya, degree awarded in 2017
- Neelam, degree awarded in 2017

Research Guidance (Ph. D): 05

- Chitra, degree awarded in Jan 2021 (Assistant Professor in DHE, Haryana)
- Neelam, degree awarded in Oct. 2021 (Part-time teacher in CDLU, Sirsa)
- Rajni, Pre-Sub Seminar held on 19 Jan 2022 (Assistant Professor C, CDLU, Sirsa)
- Bindiya (Ongoing)
- Nancy (Ongoing, granted JRF)

Invited talks

Extension Lecture on “Fiber Optics” in JCD memorial (PG) College dated on 05.04.2018

Faculty Development Programmes attended

- UGC sponsored Two-Week Online Subject Refresher Course in “Physics” (Oct 2020)
- Two-weeks FDP on “Advanced Concepts for Developing Moocs” (July 2020)
- One-week FDP “MOOCs & Moodle Based Learning Management System” (June 2020)
- One-week Online FDP on “E-Content Development” (June 2020)
- UGC sponsored Course on “Information & Communication Technology” (June 2018)
- 3-week UGC sponsored Refresher Course in “Physics” (May 2013)
- 4-week UGC sponsored Orientation Programme (June 2009)

Publications in National/International Journals (42):

1. C. Bhukkal, R. Vats, B. Goswami, N. Rani, **Rachna Ahlawat**, "Mn²⁺ doped CdO Nanopowder: Synthesis, phase conversion and characterizations via a temperature-dependent mechanism" accepted on 03 Jan 2022 in *Journal of Electronic Materials* (Springer, Scopus I.F. = 1.9).
2. Neelam Rani, Bindiya Goswami, **Rachna Ahlawat**, “Impact of Annealing on Structure, Morphology, Bandgap, Optical and Dielectric Behavior of Er³⁺ Doped SiO₂ Nanopowder Useful for Photonic Devices”, *Silicon*, accepted on 10th Nov. 2021 (Springer, I.F. 2.67).
3. Rajni Vats, **Rachna Ahlawat**, “Impact of Annealing Time on Structural Evolution of pure and Dy³⁺ doped CeO₂ Nanocrystallites, Rietveld Refinement and Optical Behavior”, *International Journal of Nanoscience*, accepted on June 16, 2021 (Taylor & Francis, Scopus I.F. 0.56).
4. Chitra Bhukkal and **Rachna Ahlawat**, “Structural and Photocatalytic Analysis of Nanostructured CdO, ZnO and their Composite Useful to Remove Textile Dyes Waste from the Drainage System”, *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, 12(4), Dec. 2021, 332-337 (Google I.F. = 5.731).
5. Neelam Rani, **Rachna Ahlawat**, “Synthesis and Structural Characterization of Samarium Doped Silica Nanopowder” *Journal of Mountain Research*, 16 (2021) 83-88.
6. Chitra Bhukkal, **Rachna Ahlawat**, “Effect of Divalent Metal Ions on Thermal Evolution and Band Gap Energy of Cadmium Oxide (CdO) Nanocrystallites: Comparative Study”, *Journal of Mountain Research*, 16 (2021) 111-119.
7. Bindiya Goswami, Neelam Rani, **Rachna Ahlawat**, “Evolution of Monoclinic CaAl₂O₄ Nanocrystallites via Chemical Route and Its Optical Investigations” *Journal of Mountain Research*, 16 (2021) 53-59.
8. C. Bhukkal, R. Vats, B. Goswami, N. Rani, **Rachna Ahlawat**, “Crystallographic and electro-optic analysis of pure and Cu/Mn-doped Cd_{0.6}Zn_{0.4}O ternary alloy: Role of the defect states and imperfection density”, *Materials Science and Engineering B*, 270 (2021) 115214, (Scopus I.F. = 4.768).

9. C. Bhukkal, R. Vats, B. Goswami, N. Rani, **Rachna Ahlawat**, "Zinc content (x) induced impact on crystallographic, optoelectronic, and photocatalytic parameters of $\text{Cd}_{1-x}\text{Zn}_x\text{O}$ ($0 \leq x \leq 1$) ternary nanopowder", *Materials Science and Engineering B*, 265 (2021) 115001, (Scopus I.F. = 4.768).
10. C. Bhukkal, R. Vats, B. Goswami, N. Rani, **Rachna Ahlawat**, "Synthesis of Cu doped $\text{Cd}(\text{OH})_2$ -CdO layered nanostructures and investigation of its different intermediate phases, optical and dc-electrical properties", *Materials Today Communications*, 25 (2020) 101608, (Scopus I.F. = 3.383).
11. C. Bhukkal, **Rachna Ahlawat**, " Cu^{2+} - Mn^{2+} -Co-doped CdO nano-crystallites: comprehensive research on phase, morphology and optoelectronic properties", *Research on Chemical Intermediates*, 46 (2020) 4211-4232 (Scopus I.F. = 2.914).
12. C. Bhukkal, M. Chohan, **R. Ahlawat**, "Synthesis, structural and enhanced optoelectronic properties of $\text{Cd}(\text{OH})_2/\text{CdO}$ nanocomposite", *Physica B: Condensed Matter*, 582 (2020) 411973 (Scopus I.F. = 2.436)
13. Neelam Rani, **Rachna Ahlawat**, Bindiya Goswami, "Annealing effect on bandgap energy and photocatalytic properties of CeO_2 - SiO_2 nanocomposite prepared by sol-gel technique" *Materials Chemistry and Physics*, 241 (2020) 12240, (Scopus I.F. = 4.094).
14. Neelam Rani, **Rachna Ahlawat**, Bindiya Goswami, "Structural, Thermal and luminescence study of Ceria nanocrystals dispersed in Silica" *Silicon*, 12, (2020) 2503–2513, (Scopus I.F. = 2.67).
15. Neelam Rani & **Rachna Ahlawat**, "Role of Ceria Nanocrystals on Morphology and Luminescence of Eu^{3+} doped SiO_2 nanopowder" *Journal of Luminescence*, 208 (2019) 135–144, (Scopus I.F. = 3.599) .
16. Neelam Rani & **Rachna Ahlawat**, "Tailoring the Structural and Optical Parameters of Eu^{3+} : CeO_2 - SiO_2 Nanopowder Via Thermal Treatment" *Silicon*, 11 (2019) 2521–2529, (Scopus I.F. = 2.67).
17. Indu Yadav, D. S. Ahlawat, **Rachna Ahlawat**, "Synthesis and Structural Investigations of Cu, Mn-doped $\text{Cd}_{1-x}\text{Zn}_x\text{S}$ Quantum Dots" *International Journal of Chemical and Physical Sciences*, 7 (2018) 1-9 (Google I.F. = 5.62).
18. Rajni Vats, **Rachna Ahlawat**, "Synthesis and Characterizations of Dy^{3+} doped $\text{Y}_2\text{O}_3:\text{SiO}_2$ nanopowder" *International Journal of Movement Education and Social Science*, 07 (2018) 129-134, (Google I.F. = 5.62).
19. Chitra Bhukkal, **Rachna Ahlawat**, "Structural and Optical Properties of Cu^{2+} doped CdO Nanoparticles" *International Journal of Advance Research in Science and Engineering*, 07 (2018) 638-643 (Google I.F. = 6.1).
20. **Rachna Ahlawat**, Neelam Rani, Bindiya Goswami, "Synthesis and characterizations of Eu_2O_3 nanocrystallites and its effect on optical investigations of Eu^{3+} , Eu^{2+} : SiO_2 nanopowder" *Journal of Alloys and Compounds*, 743 (2018) 126-135, (Scopus I.F. = 5.316).
21. Bindiya Goswami, Neelam Rani, **Rachna Ahlawat**, "Structural and optical investigations of Nd^{3+} doped Y_2O_3 - SiO_2 nanopowder" *Journal of Alloys and Compounds*, 730 (2018) 450-457, (Scopus I.F. = 5.316).
22. **Rachna Ahlawat** "Structural and optical behavior of Y_2O_3 nanocrystallites synthesized by sol-gel technique" *Advanced Materials Proceedings*, 2 (2017) 687-690.
23. **Rachna Ahlawat** "Study on Photoluminescence of Europium Oxide Nanoparticles" *International Journal of Advance Research in Science and Engineering*, 06 (2017) 591, (Google I.F. = 6.1).
24. **Rachna Ahlawat** "Synthesis and Characterizations of Europium doped Silica Nanophosphor" *International Journal of Advance Research in Science and Engineering*, 06 (2017) 1077-1085, (Google I.F. = 6.1).
25. **Rachna Ahlawat** "Thermal and Structural analysis of Nd^{3+} doped Y_2O_3 - SiO_2 nanopowder" *International Journal of Advance Research in Science and Engineering*, 05 (2016) 518-526, (Google I.F. = 6.1).

26. I. Yadav, D. S. Ahlawat, **Rachna Ahlawat** “Cu-doped $\text{Cd}_{1-x}\text{Zn}_x\text{S}$ alloy: synthesis and structural investigations” *Applied Physics A*, 122 (2016) 245, (Scopus I.F. = 2.584).
27. D.S. Ahlawat **Rachna Ahlawat**, Vipin Gupta and Amrik Singh, “Laser signal loss and reflection in optical fiber” *University Research Journal- Eclectic Explorations*, 1 (2015) 58-63.
28. **Rachna Ahlawat**, “Synthesis and Structural Behavior of Nanosized Rare Earth Sesquioxides in Silica Matrix” *International Journal of Science, Technology & Management*, 04 (2015) 122-131 (Google I.F. = 6.3).
29. **Rachna Ahlawat**, Nidhi, I. Yadav, D.S. Ahlawat, Praveen Aghamkar, “Concentration dependent structural behavior of Gd_2O_3 nanocrystallites dispersed in silica matrix” *Journal of Optoelectronics and Advanced Materials*, 17 (2015) 640-645, (Scopus I.F. = 0.631).
30. **Rachna Ahlawat**, “ $\text{Gd}_2\text{O}_3:\text{SiO}_2$ Nanocomposite: Study on Structural and Optical Behavior” *International Journal of Applied Ceramic Technology*, 12 (2015) E 256 – E 260, (Scopus I.F. = 1.962).
31. **Rachna Ahlawat**, “Influence of annealing temperature on structural and optical properties of $\text{SiO}_2:\text{RE}_2\text{O}_3$ [RE = Y, Gd] powder” *Journal of Alloys and Compounds*, 638 (2015) 356–363, (Scopus I.F. = 5.316).
32. **Rachna Ahlawat**, “Influence of multi-step annealing on nanostructure and surface morphology of $\text{Y}_2\text{O}_3:\text{SiO}_2$ powder” *Ceramics International*, 41 (2015) 7345–7351, (Scopus I.F. = 4.527).
33. **Rachna Ahlawat**, “Effect of Temperature on Densification of $\text{Y}_2\text{O}_3:\text{SiO}_2$ powder” *International Journal of Advanced Technology in Engineering and Science*, 03 (2015) 669-674, (Google I.F. = 5.6).
34. **Rachna Ahlawat**, “Preparation and Effect of Thermal Treatment on $\text{Gd}_2\text{O}_3:\text{SiO}_2$ Nanocomposite” *Modern Physics Letter B*, 29 (2015) 1550046, (Scopus I.F. = 0.731).
35. D. S. Ahlawat, K. Kumar, **Rachna Ahlawat** and S. Kumar, “Characteristics and quality of grown potassium thiourea iodide crystal for second harmonic generation” *Journal of Materials Science: Materials in Electronics*, 26 (2015) 2215–222, (Scopus I.F. = 2.478).
36. **Rachna Ahlawat**, “Effect of Concentration and Temperature on the Surface morphology of Gd_2O_3 Nanocrystallites in Silica” *International Journal of Applied Ceramic Technology*, 12 (2015) 1131-1139, (Scopus I.F. = 1.962)
37. **Rachna Ahlawat** and P. Aghamkar, “Influence of Annealing Temperature on $\text{Y}_2\text{O}_3:\text{SiO}_2$ Nanocomposite Prepared by Sol-Gel Process” *ACTA PHYSICA POLONICA A*, 126 (2014) 736-739, (Scopus I.F. = 0.43).
38. **Rachna Ahlawat**, “Synthesis of some optical materials by sol-gel technique and their structural characterization” *International Archives of Science and Technology*, 14 (2014) 9-15, (I.F. = 1.5).
39. D.S. Ahlawat, R. Kumari, **Rachna Ahlawat** and Indu Yadav, “Synthesis and Characterization of Sol–Gel Prepared Silver Nanoparticles” *International Journal of Nanoscience*, 13 (2014) 1450004, (Scopus I.F. = 0.56).
40. **Rachna Ahlawat** and P. Aghamkar, “Morphological and Optical Investigation of $\text{Y}_2\text{O}_3:\text{SiO}_2$ Powder by Wet Chemical Process” *Optical Materials*, 36 (2013) 337-341, (Scopus I.F. = 3.080).
41. **Rachna Ahlawat** and P. Aghamkar, “ $\text{Y}_2\text{O}_3:\text{SiO}_2$ Binary Oxide: Synthesis and Structural Characterization” *Journal of Optoelectronics and Advanced Materials*, 15 (2013) 1032-1036, (Scopus, I.F. = 0.631).
42. D. S. Ahlawat, Vipin Gupta, **Rachna Ahlawat** and Mahipal Singh Gill, “Optical Fiber Characterization by Optical Time Domain Reflectometer” *International Journal of Applied Engineering Research*, 7 (2012) 1818-1822, (Scopus, I.F. = 0.51)

43. D.S. Ahlawat, A. K. Sharma, L. Taneja, **Rachna Ahlawat**, R.D. Singh, “Time resolved spectroscopy in laser grade organic dyes” *Optics Communications*, 282 (2009) 4256-4258, (Scopus, I.F. = 2.310).

Research Papers Published in Conference Proceedings (19):

44. Bindiya Goswami, Neelam Rani, Rajni Vats, Chitra Bhukkal, **Rachna Ahlawat**, “Highly Crystalline and Narrow Bandgap MgAl_2O_4 : Synthesis and Characterization”, *AIP Conference Proceedings*, 2352, 020045 (1–6); 2021, (Scopus I.F. = 0.4).
45. Rajni Vats, Chitra Bhukkal, Bindiya, Neelam Rani and **Rachna Ahlawat**, “Structural and Dye Degradation Study of Cubic Nanocrystalline Yttria” *AIP Conference Proceedings*, 2352, 040035(1-5); 2021, (Scopus I.F. = 0.4).
46. Neelam Rani, Bindiya Goswami, Rajni Vats, Chitra Bhukkal, **Rachna Ahlawat**, “Yb doped SiO_2 Nanorods Prepared by Sol-Gel Method” *AIP Conference Proceedings*, 2352, 040026 (1-6); 2021, (Scopus I.F. = 0.4).
47. C. Bhukkal, R. Vats, B. Goswami, N. Rani, **Rachna Ahlawat**, “Study of Crystallographic Modification in Cadmium Oxide (CdO) Nanocrystallites due to Doped Transition Metal (TM) ions” *AIP Conference Proceedings*, 2352, 040005(1-5); 2021, (Scopus I.F. = 0.4).
48. Chitra Bhukkal, **Rachna Ahlawat**, “Identification of Different Phases and Thermal Analysis of Mn Doped Cadmium Oxide Nano-rods” in Proceedings of CAMNP-2019 Organized by Deptt of Applied Physics, Delhi Technical University, Delhi, India during 18-20 Dec 2019, ISBN No: 978-81-942877-3-5.
49. Rajni Vats, **Rachna Ahlawat**, “Structural Investigations of Dy^{3+} Doped Cubic Gd_2O_3 Nanopowder via Rietveld Refinement” in Proceedings of CAMNP-2019 Organized by Deptt of Applied Physics, Delhi Technical University, Delhi, India during 18-20 Dec 2019, ISBN No: 978-81-942877-3-5.
50. Bindiya Goswami **Rachna Ahlawat** “Effect of Doping on Structural and Luminescence Behavior of Calcium Aluminates” in Proceedings of CAMNP-2019 Organized by Deptt of Applied Physics, Delhi Technical University, Delhi, India during 18-20 Dec 2019, ISBN No: 978-81-942877-3-5.
51. N. Rani, **Rachna Ahlawat**, “Structural and Optical Properties of $\text{Nb}_2\text{O}_5/\text{SiO}_2$ Powder Prepared by Sol-gel Method” *AIP Conference Proceedings*, 2265, 030128, 05 Nov 2020, (Scopus I.F. = 0.4).
52. Chitra Bhukkal and **Rachna Ahlawat**, “Plate like $\text{Cd}(\text{OH})_2\text{-CdO}$ Nanocomposite: A study on Surface Morphology and Band Gap Energy” *AIP Conference Proceedings*, **2142**, 140017, 29 August 2019, (Scopus I.F. = 0.4).
53. Neelam Rani and **Rachna Ahlawat**, “Effect of annealing on Photo degradation of Rhodamine 6G using $\text{CeO}_2\text{-SiO}_2$ nanocomposite” *AIP Conference Proceedings*, **2142**, 140014, 29 August 2019, (Scopus I.F. = 0.4).
54. Rajni Vats and **Rachna Ahlawat**, “Structural and optical Investigations of $\text{Gd}_2\text{O}_3\text{:Dy}^{3+}$ Nanophosphor”, *AIP Conference Proceedings*, **2142**, 140013, 29 August 2019, (Scopus I.F. = 0.4).
55. B. Goswami **Rachna Ahlawat**, Neelam Rani, “Characterizations of $\text{Pb}^{2+}\text{:ZnAl}_2\text{O}_4$ Spinel Synthesized via Citrate Sol-Gel Technique,” *AIP Conference Proceedings*, **2142**, 070021, August 2019, (Scopus I.F. = 0.4).
56. Neelam Rani, **Rachna Ahlawat**, “Impact of Indirect Excitation Mechanism on Luminescence Enhancement of $\text{Eu}^{3+}\text{:SiO}_2\text{-CeO}_2$ Nanopowder”, *AIP Conference Proceedings*, **2115**, 030198-4, 12 July 2019, (Scopus I.F. = 0.4).
57. D.S. Ahlawat, J. Singh, **Rachna Ahlawat**, M.S. Gill, “Study of Acoustical Parameters and Molecular Interactions in Liquid Mixtures Ultrasonic Technique” in proceeding of National Seminar on Recent Development in Advanced Materials and Photonics organized by Department of Physics, Hindu College Sonipat-131001 on 05 March 2016, ISBN No: 978-93-82391-91-3.

58. D.S. Ahlawat, M. Poonia and **Rachna Ahlawat**, “Growth and Characterization of KDP Crystal” in proceeding of International Conference on Frontiers in Materials Research and applications (FMRA-2014) at Shaheed Bhagat Singh State Technical Campus, Ferozepur-152004, Punjab, India during 30-31 Oct. 2014, ISBN No: 978-93-83842-92-6.
59. **Rachna Ahlawat**, “Structural and Surface Morphology of $Gd_2O_3:SiO_2$ powder” in proceeding of International Conference on Frontiers in Materials Research and applications (FMRA-2014) organized by Shaheed Bhagat Singh State Technical Campus, Ferozepur-152004, Punjab, India during 30-31 Oct. 2014, ISBN No: 978-93-83842-92-6.
60. D. S. Ahlawat, N. Godara, **Rachna Ahlawat**, D. Mohan, and R.D. Singh “Photobleaching Study of Rhodamine-B Doped Polymer samples” in Proceeding of National Conference on trends and applications in Laser technology and Optoelectronics (TALTO-1) organized by Amity Institute of Laser technology and Optoelectronics, Amity Education Valley, Gurgaon, (Haryana), India on 04 April 2013, ISBN No: 978-81-8424-826-5.
61. D. S. Ahlawat, **Rachna Ahlawat** and Neelam Godara, “Laser Induced Ultra-Fast Processes in Nanostructured Materials” in proceeding of National Conference on Modern Development in Engineering and Sciences organized by Ambala College of Engg. & Applied Research, Devsthal, Ambala-133101 (Haryana) during 27-28 Feb, 2009.
62. D.S. Ahlawat, **Rachna Ahlawat**, S. Kumari “Adbhut Carbon Aproop: Fullrenes” in proceeding of Akhil Bhartia Rajbhasa Vaganic / Takniki Sangostthi on Anusandhan tathha Vikas me Gann Parbandhan ki Bhumika, Raksha Vaganic Suchna tathha Parlekhan Kender organized by DRDO-Metcalf House, Greater Kailash, New Delhi, Delhi 110054 during 12-13 Feb, 2009, ISBN No: 978-81-86514-27-6.

Paper published as Chapters in edited Books/Monograph (05):

63. Bindiya Goswami **Rachna Ahlawat** “Effect of Doping on Structural and Luminescence Behavior of Calcium Aluminates” as Chapter-29 in the book-series ‘Springer Proceedings in Physics’ entitled as “Proceedings of International Conference on Atomic, Molecular, Optical and Nano Physics with Applications” edited by Vinod Singh, Rinku Sharma, Man Mohan, Mohan Mehata and A. K. Razdan, Springer Nature Singapore Pte Ltd. ISBN:978-981-16-7690-1
64. Rajni Vats, **Rachna Ahlawat**, “Structural Investigations of Dy^{3+} Doped Cubic Gd_2O_3 Nanopowder via Rietveld Refinement” as Chapter-26 in the book-series ‘Springer Proceedings in Physics’ entitled as “Proceedings of International Conference on Atomic, Molecular, Optical and Nano Physics with Applications” edited by Vinod Singh, Rinku Sharma, Man Mohan, Mohan Mehata and A. K. Razdan, Springer Nature Singapore Pte Ltd. ISBN:978-981-16-7690-1
65. Chitra Bhukkal, **Rachna Ahlawat**, “Identification of Different Phases and Thermal Analysis of Mn Doped Cadmium Oxide Nano-rods” as Chapter-22 in the book-series ‘Springer Proceedings in Physics’ entitled as “Proceedings of International Conference on Atomic, Molecular, Optical and Nano Physics with Applications” edited by Vinod Singh, Rinku Sharma, Man Mohan, Mohan Mehata and A. K. Razdan, Springer Nature Singapore Pte Ltd. ISBN:978-981-16-7690-1
66. Chitra Bhukkal, Rajni Vats, **Rachna Ahlawat** “Structural and Optical Study of Mn doped CdO nanoparticles” as Chapter in the Book “Nanotechnology” Edited by Vijaya Tomar, Co-editor-Mrs. Anshu Uppal Published by Anu Books, New Delhi (Jan 2019) 169-176, ISBN No: 978-93-82166-87-0
67. **Rachna Ahlawat** and P. Aghamkar “ $Gd_2O_3:SiO_2$ Nanocomposite: Synthesis and Structural Characterization” as Chapter in the Book “Nanotechnology: Novel Perspectives and Prospects” Edited by Bhupinder Singh, Anupma Kaushik, S. K. Mehta, S. K. Tripathi (Associate editors: Sonia Kapoor, Satym K. Aggarwal) Mc Graw Hill Education (India) Private Ltd. (2015) 457-46113, ISBN No: 978-93-392-2109-6 & 10:93-392-2109-5

Paper Presentations in Conferences/Seminars

1. "Impact of Thermal Treatment on Surface Morphology and Band Gap Modification of In₂O₃/SiO₂ Nanocomposite, in 63rd Solid state Physics Symposium in 65th DAE-Solid State Physics Symposium organized by Bhabha Atomic Research Centre (BARC), Mumbai, India at DAE Convention Centre, Anushaktinagar, Mumbai during December 15 -19 December 2021
2. "Structural and Photocatalytic Analysis of Nanostructured CdO, ZnO and their Composite Useful to Remove Textile Dyes Waste from the Drainage System" in international E-conference on Sustainable and Futuristic Materials (SFM-2021) organized by International Research Centre and Department of Chemistry, Kalasalingam Academy of Research and Education, Krishnankoli, Gondia Education Society's Department of Chemistry, J. M. Patel Arts, Commerce and Science College, Bhandra, Amar Sewa Mandal's Department of Chemistry, Kamla Nehru Mahavidyalaya, Nagpur (Maharashtra), India during 29-30 Nov. 2021.
3. "Environmental impact of CdO, ZnO and their alloyed nanocomposite: Significant in degradation of textile dyes waste", in e-international conference on Plant Biodiversity and Environment Conservation (ICPBEC-2021) held at Hans Raj Mahila Maha Vidyalaya in collaboration with Punjab Biodiversity Board, Jalandhar, Punjab (India) during May 20-21, 2021.
4. "Effect of Annealing on Thermal Evolution and Photoluminescence of Zinc Aluminate Spinal Nanocrystallites" in the international e-conference on "Recent Advances in Material Science (ICRAMS-2021)" held on 15th to 17th May 2021 Organized by Department of Physics, HNB Garhwal University (A Central University) Srinagar (Garhwal) – 246174 Uttarakhand – India & Govt. Degree College, Maldevta, Raipur, Dehradun Uttarakhand – India in collaboration with Uttarakhand Science Education and Research Centre, Dehradun Uttarakhand- India.
5. "Impact of heat treatment on formation of CaAl₂O₄ Nanocrystalline Powder", in online international conference on Scientific Developments in the Current Era (ICSDE-2021) Held at I.B. Post Graduate College, G.T. Road, Panipat, Haryana (India) April 9-10, 2021.
6. "Fabrication of Some Metal Aluminates by Citrate Sol-Gel Method at Moderate Temperature and their Characterizations", in TEQIP sponsored International Conference 'Aatamnirbhar Bharat' Technological Transformation and Preparedness in the Post COVID World Held at DCRUS&T, Murthal (Sonapat)-131039, India during March 22-23, 2021.
7. "Synthesis and Structural Characterization of Samarium Doped Silica Nano powder" in 5th International multidisciplinary Research Conference (IMRC-2020 held at Center for International Program, Osmania University Campus, Hyderabad (India) on 26th Dec, 2020.
8. "Identification of Different phases and Thermal Analysis of Mn Doped Cadmium Oxide Nano-rods" International Conference on Atomic, Molecular, Optical and Nano Physics with Applications: (CAMNP-2019) Organized by Deptt of Applied Physics, Delhi Technical University, Delhi, India during 18-20 Dec 2019.
9. "Synthesis & Structural properties of Er-SiO₂ powder prepared by Sol-gel method" in national conference on Multidisciplinary Approach in Science: Present Trends and Future prospects (NCMAS-2019) Organized by Faculty of Science of I B (PG) College Panipat, Haryana on 8 Nov 2019.
10. "Metal Aluminates: An innovative idea of advance nano technology of science", in national seminar on Interdisciplinary Approach: with special reference to science & technology, Humanities and commerce organized by Jan Nayak Ch. Devi Lal Memorial (PG) College, Sirsa-125055 on 21 Feb, 2019.
11. "Eu³⁺ doped SiO₂/CeO₂ Nano -composite: Synthesis and Band gap Engineering for Photocatalytic Applications in 63rd Solid state Physics Symposium organized by BARC Mumbai at auditorium hall, GJUS & T, Hisar-125001 during 18-22 Dec. 2018.

12. "Structural properties of Cu, Mn doped CdO nanoparticles by co-precipitation method", in international conference on Materials for Energy Applications organized by S.S. Jain Subodh PG (autonomous) College Jaipur, affiliated to University of Rajasthan, Jaipur-302004, India during 6-8 Dec. 2018.
13. "Structural and Optical Properties of Cu²⁺ doped CdO Nanoparticles" in international conference on Recent Researches and Innovations in Sciences, Management, Education and Technology organized by JCD PG College of Education, Jan Nayak Ch. Devi Lal Vidyapeeth, Sirsa-125055, Haryana during 27-28 March, 2018.
14. "Structural and Optical Study of Mn doped CdO nanoparticles", in DGHE Sponsored National Seminar on 'Nanochemistry' organized by C.M.K. National P.G. College, Sirsa-125055 on 9 Jan. 2018.
15. "Effect of Co-doping on Morphology and Band Gap Energy of CdO Quantum Dots" in international conference on Advances in Optics and Photonics (ICAOP-2017) organized by Department of Physics GJUS&T Hisar-125001, India during 23-26 Nov. 2017.
16. "Photoluminescence investigations of Neodymium Doped Binary Oxides" in international conference on Symbiotic Development of Mathematical, Physical, Chemical & Computational Sciences & Symposium on Recent Advances and Future Directions on Math in Bio-Sciences organized by Department of Mathematics, G J U S & T, Hisar, Haryana, India during 28-30, Oct. 2017.
17. "Study on Photoluminescence of Europium Oxide Nanoparticles" in 3rd international conference on Emerging Trends in Engineering, Technology, Science and Management (IETE) organized by Institute of Electronics and Telecommunication Engineers, Lodhi Road, Delhi, India on 11 June, 2017.
18. "Synthesis and Characterizations of Europium doped Silica Nanophosphor" 4th international conference on Recent Development in Engineering Science, Humanities and Management National Institute of Technical Teachers Training & research, Chandigarh, India on 02 April, 2017.
19. "Thermal and structural analysis of Nd³⁺ doped Y₂O₃-SiO₂" in 3rd international conference on Recent Innovations in science, Technology, Management and Environment organized by Indian federation of United Nations Association, New Delhi, India on 18 Dec., 2016.
20. "Influence of multi-step annealing on optical behavior of Y₂O₃ Nanocrystallites" in national conference on Emerging Trends in Physics and Materials Science (ETPMS-2016) organized by Department of Physics, Ch. Devi Lal University, Sirsa-125055 during 19-20 March, 2016.
21. "Structural and Optical Behavior of Y₂O₃ Nano crystallites Synthesized by Sol-Gel Technique" in international conference on Materials Science & Technology organized by IAAM and VBRI press at Conference center, D. U. Delhi 110007, India during 01-04 March, 2016.
22. "Synthesis and Structural properties of Cd_{0.3}Zn_{0.7}S with and without dopants" in 3rd national conference on Photonics and Materials Science (NCPMS-2015) organized by Department of Applied Physics, GJUS & T, Hisar-125001 during 18-19 Nov. 2015.
23. "Synthesis and Structural behavior of Nanosized Rare Earth Sesquioxides in Silica matrix" in international conference on Recent Innovations in Science, Engineering and Management organized by YMCA, Connaught Place, New Delhi on 30th May, 2015.
24. "Effects of Four Steps Sintering on Y₂O₃:SiO₂ Nanocomposite" in international conference on Current Development in Atomic, Molecular, Optical and Nano Physics with Applications organized by Department of Physics and Astrophysics, D.U. Delhi, India (CDAMOP-2015) during 11-14 March, 2015.
25. "Study on Structural and Optical Properties of Some Binary Oxides" in national conference on Emerging Trends in Physics and Materials Science (ETPMS-2015) organized by Department of Physics, Ch. Devi Lal University, Sirsa-125055, Haryana (India) during 09-10 March, 2015.

26. "Influence of multi-step annealing on structural behavior of rare earth oxides doped in silica", in national conference on Applied Physics and Material Science organized by Department of Physics, M. D. U. Rohtak, Haryana during 05-06 Feb. 2015.
27. "Effect of Temperature on Densification of $\text{Y}_2\text{O}_3\text{:SiO}_2$ powder" in international conference on Science, Technology and Management (ICSTM-2015) organized by YMCA Connaught Place, New Delhi on 1st Feb. 2015.
28. " $\text{Gd}_2\text{O}_3\text{:SiO}_2$ Composites: Gate material for electronic devices" in national conference on Recent Advancement in Management, Commerce, Education and Engineering Outlook-2015) organized by JCD Institute of Business Management, Sirsa (Haryana) India during 21-22 Jan. 2015.
29. "Structural and Surface Morphology of $\text{Gd}_2\text{O}_3\text{:SiO}_2$ powder" in international conference on Frontiers in Materials Research and applications (FMRA-2014) organized by Shaheed Bhagat Singh State Technical Campus, Ferozepur-152004, Punjab, India during 30-31 October 2014.
30. "Role of Concentration and Heat Treatment in Gadolinium Doped Silica Nanocomposite" in 2nd national conference on Photonics & Material Science (NCPMS-2014) organized by Deptt. of Applied Physics, G.J.U. S. & T. Hisar during 20-21 March, 2014.
31. "Synthesis of Gadolinium Oxide in SiO_2 Matrix and Its Structural Characterization" in national conference on Recent developments in Chemical Sciences (NRDCS-14) organized by Deptt. of Chemistry, G.J.U. S. & T. Hisar during 25-26 Feb, 2014.
32. " $\text{Gd}_2\text{O}_3\text{:SiO}_2$ Nanocomposites: Synthesis and Structural Characterization" in international conference on Nanotechnology in the Service of Health, Environment & Society (Nano Sci Tech-2014) organized by Panjab University, Chandigarh during 13-15 Feb, 2014.
33. "Photoluminescence Study of $\text{Gd}_2\text{O}_3\text{:SiO}_2$ Nanocomposites" in 1st Indo - UK international conference Recent Advances in Chemical Sensors (UGC-UKIERI IU CRACS-2014) organized by Gargi College, Siri Fort Road, New Delhi-110049 during 10-11 Feb, 2014.
34. "Synthesis and Characterization of Gadolinium Oxide Nanocomposites in Silica Matrix" in international conference on Science and Engineering of Materials organized by School of Basic Sciences and Research, Sharda University, India during 6-8 Jan., 2014.
35. "Synthesis and Structural Study of Gadolinium Oxide in SiO_2 Matrix by Sol Gel Process" in national symposium on Emerging Trends in Physics for Ionizing Radiations Aerosols and Material Science organized by Deptt. of Physics, Punjabi University, Patiala-147002 (India) during 13-14 Dec. 2013.
36. "Photobleaching Study of Rhodamine-B Doped Polymer samples" in national conference on Trends and Applications in Laser technology and Optoelectronics organized by Amity Institute of Laser technology and Optoelectronics, Amity Education Valley, Gurgaon, India on 04 April 2013.
37. "Preparation and Surface Morphology of Yttrium Oxide Doped Silica Nanoparticles" in national conference on Nanoscience and Instrumentation Technology (NCNIT-2013) organized by Department of Physics, National Institute of Technology, Kurukshetra (Haryana) during 28-29 March, 2013.
38. "Synthesis of Cu Doped $\text{Cd}_{1-x}\text{ZnS}$ Nanomaterial using Co-precipitation Method" in national conference on Physics of Engineering Materials organized by Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Haryana) during 15-17 March, 2013.
39. "Sol-Gel Technique: Chemical Route to Synthesize New Generation Materials" in national conference on New Frontiers in Physics organized by D. N. College, Hisar (Haryana) during 12-13 March, 2013.

40. "Formation and Technological Applications of Yttria Nanoparticles" in international conference on Evolution in Science & Technology & Eynon Educational Methodologies organized by PPIMT, 20 K.M. Stone, N.H.-65, Choudharywas, Rajgarh Road, Hisar-125001, during 03-04 March, 2013.
41. "Preparation and XRD Study of Yttria Doped in SiO₂ by Chemical Process" in national conference on Advances in Chemical Sciences (ASC-2013) organized by Department of Chemistry, M.D.U., Rohtak (Haryana) during 01-02 March, 2013.
42. "Embedded Rare Earth Oxide Nanoclusters in SiO₂ Matrix" in national conference on Advanced Materials & Devices (NCAMD-2013) organized by Hindu College, Sonapat (Haryana) during 27-28 Feb. 2013.
43. "Detection of Water Pollution by Laser Spectroscopy", in international conference Emerging Trends in Physics for Environmental Monitoring and Management (ETPEMM-12) organized by Department of Physics, Punjabi University, Patiala (Punjab), India during 17-19 Dec. 2012.
44. "Study of Sol-Gel Prepared Silver Nanoparticles", in national conference 'Nanotechnology: Interdisciplinary Aspects', organized by YMCA University of Science & Technology, Faridabad (Haryana) during 12 Dec., 2012.
45. "Optical Fiber Characterization by Optical Time Domain Reflectometer" in 3rd International Conference on Emerging Trends in Engineering and Technology organized by Geeta Institute of Management and Technology (GIMT), Kanipla, Kurukshetra (Haryana), India during 9-11 November 2012.
46. "Influence of annealing temperature on Y₂O₃:SiO₂ nanocomposites prepared by sol gel process" International Conference and Workshop on Nanostructured Ceramics and other Nanomaterials 'ICWNCN-2012' organized by Department of Physics & Astrophysics, University of Delhi, Delhi, India during 13-16 March 2012.
47. "Synthesis and Structural Characterization of Y₂O₃:SiO₂ Nanocomposite" in National Conference on 'Materials Science: Applications in Energy & Environment', organized by DAV College Jalandhar, Punjab during 02-03 March 2012.
48. "Characterization of Binary Oxide- Prepared by Sol-Gel Technique" in International Conference on Nanomaterials & Nanotechnology organized by University of Delhi, Delhi, India during 18-21 December 2011.
49. "Photophysical Properties of Laser Grade Coumarins" presented in National Conference on Photonics & Materials Science (NCPMS-2008) organized by Deptt. of Applied Physics, G.J.U.S.&T, Hisar-125001, Haryana, India, during 24-25 October 2008.