



## Dr. Ganesh Lal

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### Research Interests

Main interest of the research is synthesis of doped and intrinsic metal oxides like nanoferrites, perovskite and spintronic materials and studies of structural, morphology, optical, dielectric and magnetic properties. Materials are prepared via auto combustion sol-gel routes which required low cost raw materials, less number of equipments and also environment friendly. A key point of research is search of environment friendly, chemically and physically stable, better semiconducting and magnetically rich materials that could also exhibit superparamagnetism at room temperature for various applications. In addition, attempts are made for understanding the tuning of structural, optical, dielectric and magnetic properties by virtue of annealing and varying the elemental compositions in nanoferrites & perovskites.

### ACADEMIC DETAILS

#### Higher Education

Ph. D in Physics

Mohanlal Sukhadia University Udaipur

Supervised by

Dr. Sudhish Kumar

(Professor)

Thesis title: **Study of Structural and Magnetic Properties of Some**

**Mixed Valence Rare Earth and Transition Metal Oxides**

M. Tech in Optoelectronics and Optical Communications

Indian Institute of Technology, Delhi.

M. Sc. In Physics

Mohanlal Sukhadia University, Udaipur

B. Sc.

Mohanlal Sukhadia University, Udaipur

### School Education

Class	Subjects	Board	Percentage
12 <sup>th</sup>	Physics, Chemistry, Mathematics, English and Hindi	C.B.S.E. Delhi	73.2
10 <sup>th</sup>	Math, Science, Social Science, English and Hindi	C.B.S.E. Delhi	79.8

### TEACHING EXPERIENCE

- Appointed as Assistant Professor Department of Physics, Hans Raj College University of Delhi, 23 November 2022.
- Five years teaching experience during Ph.D Pursuing at University College of Science, MLSU Udaipur.
- Two years experience as teaching assistant (TA) at IIT Delhi during M.Tech. 2011 to 2013.

### SCHOLARSHIP ACHIEVEMENT

HRD Scholarship

1. **Received Best Poster Award** in 3<sup>rd</sup> International Conference on Condensed Matter & Applied Physics at Bikaner, India during October 14-15, 2019.
2. Awarded UGC BSR fellowship for Ph. D for five years tenure in 2015.
3. Received MHRD scholarship for study in M. Tech at IIT Delhi in 2011.
4. Awarded as assistantship under the MHRD UGC-BSR scheme for the securing first position in the M. Sc. Project entitled “Magnetic and structural properties of Cu substituted nano sized  $Cu_xCo_{0.5-x}Zn_{0.5}Fe_2O_4$ ”

### PROJECTS

1. Study of magnetic and structural properties of nano sized particle Cu substituted nano sized  $Cu_xCo_{0.5-x}Zn_{0.5}Fe_2O_4$  samples prepared by varying the ratio of Cu and Cobalt and the magnetic and structural properties of the sample studied. (The work was done under the supervision of Late Prof. K. Venugopalan during M. Sc.).
2. Design of a non-invasive optoelectronic device for measurement of blood glucose concentration. (The project was done under the supervision of Prof. Sneha Anand,

Centre for Biomedical Engineering IIT Delhi, Prof. M. R. Shenoy, Department of Physics IIT Delhi and in collaboration with AIIMS Delhi).

### **TECHNICAL SKILLS**

- Basic Computer, Origin, Rietveld refinement and Powder X.
- Handling of Atomic Force Microscopy and ac-susceptibility set up.

### **OTHER ACTIVITY**

- Scout & Guiding: Awarded Rajaya Puraskar  
Attended many camps in scout & guiding and worked for environment protection, blood donation camp, collection of money for cancer patients, learn about disaster management and to deal with accidental people.
- NCC : A certificate

### **STRENGTHS**

- Punctuality & Commitment to perform
- Eagerness to learn & acquire new skills
- Quick to adapt to new environment
- Able to Hard work

### **DECLARATION**

I hereby declare that the information furnished above is true to the best of my Knowledge and belief.

Date: 11-02-2023

Dr. Ganesh Lal

## List of Publications

1. **Ganesh Lal**, K. Punia, H. Bhoi, S. N. Dolia, B. L. Choudhary, P. A. Alvi, S. Dalela, S. K. Barbar and S. Kumar, Exploring the structural, elastic, optical, dielectric and magnetic characteristics of  $\text{Ca}^{2+}$  incorporated superparamagnetic  $\text{Zn}_{0.5-x}\text{Ca}_{0.1}\text{Co}_{0.4+x}\text{Fe}_2\text{O}_4$  ( $x = 0.0, 0.05$  &  $0.1$ ) nanoferrites, *Journal of Alloys and Compounds* **886** (2021) 161190.
2. **Ganesh Lal**, J. Joshi, H. Bhoi, K. Punia, S. N. Dolia, B. L. Choudhary, S. K. Barbar and S. Kumar, Impact of hydrogenation on the structural, dielectric and magnetic properties of  $\text{La}_{0.5}\text{Ca}_{0.5}\text{MnO}_3$ , *Applied Physics A* **127** (2021) 114.
3. **Ganesh Lal**, K. Punia, S. N. Dolia, P. A. Alvi, B. L. Choudhary and S. Kumar, Structural, cation distribution, optical and magnetic properties of quaternary  $\text{Co}_{0.4+x}\text{Zn}_{0.6-x}\text{Fe}_2\text{O}_4$  ( $x = 0.0, 0.1$  and  $0.2$ ) and Li doped quinary  $\text{Co}_{0.4+x}\text{Zn}_{0.5-x}\text{Li}_{0.1}\text{Fe}_2\text{O}_4$  ( $x = 0.0, 0.05$  and  $0.1$ ) nanoferrites, *Journal of Alloys and Compounds* **828** (2020) 154388.
4. **Ganesh Lal**, K. Punia, S. N. Dolia, P. A. Alvi, S. Dalela and S. Kumar, Rietveld refinement, Raman, optical, dielectric, Mössbauer and magnetic characterization of superparamagnetic fcc- $\text{CaFe}_2\text{O}_4$  nanoparticles, *Ceramics International* **45** (2019) 5837-5847.
5. S. Tiwari, **Ganesh Lal**, H. Bhoi, K. Punia, S. S. Meena and S. Kumar, Coexistence of superparamagnetism and superspin glass in non-stoichiometric  $\text{Zn}_{0.5}\text{Ca}_{0.5}\text{Fe}_2\text{O}_4$  nanoferrites, *Journal of Magnetism and Magnetic Materials* **570** (2023) 170466.
6. H. Bhoi, S. Tiwari, **Ganesh Lal**, K. K. Jani, S. K. Modi, P. Seal, V. Saharan, K. B. Modi, J. P. Borah, K. Punia and S. Kumar, Green synthesis and characterization of  $\text{Mg}_{0.93}\text{Na}_{0.07}\text{O}$  nanoparticles for antimicrobial activity, cytotoxicity and magnetic hyperthermia, *Ceramics International* **48** (2022) 28355-28373.
7. A. Kumar, M. K. Gora, **Ganesh Lal**, B. L. Choudhary, P. L. Meena, R. S. Dhaka, R. K. Singhal, S. Kumar and S. N. Dolia, Impact of  $\text{Gd}^{3+}$  doping on structural, electronic, magnetic, and photocatalytic properties of  $\text{MnFe}^2\text{O}^4$  nanoferrites and application in dye-polluted wastewater remediation, *Environmental Science and Pollution Research* (2022).
8. K. Punia, **Ganesh Lal**, S. Dalela, S. N. Dolia, P. A. Alvi, S. K. Barbar, K. B. Modi, and S. Kumar, A comprehensive study on the impact of Gd substitution on structural,

- optical and magnetic properties of ZnO nanocrystals, *Journal of Alloys and Compounds* **868** (2021) 159142.
9. K. Punia, **Ganesh Lal**, S. K. Barbar, S. N. Dolia, P. A. Alvi, S. Dalela and S. Kumar, Oxygen vacancies mediated cooperative magnetism in ZnO nanocrystals: A  $d^0$  ferromagnetic case study, *Vacuum* **184** (2021) 109921.
  10. K. Punia, **Ganesh Lal**, S. N. Dolia and S. Kumar, Defects and oxygen vacancies tailored structural, optical, photoluminescence and magnetic properties of Li doped ZnO nanohexagons, *Ceramics International* **46** (2020) 12296-12317.
  11. K. Punia, **Ganesh Lal**, P. A. Alvi, S. N. Dolia, S. Dalela, K. B. Modi, S. Kumar, A comparative study on the influence of monovalent, divalent and trivalent doping on the structural, optical and photoluminescence properties of  $Zn_{0.96}T_{0.04}O$  (T:  $Li^+$ ,  $Ca^{2+}$  &  $Gd^{3+}$ ) nanoparticles, *Ceramics International* **45** (2019) 13472-13483.
  12. **Ganesh Lal**, K. Punia, H. Bhoi, S. N. Dolia, B. L. Choudhary, P. A. Alvi, S. K. Gupta and S. Kumar, Wasp-waisted like magnetic behavior of nanocrystalline  $CoFe_2O_4$  at 5K, *AIP Conference Proceedings* **2220** (2020) 110031.
  13. **Ganesh Lal**, K. Punia, S. N. Dolia, H. Bhoi, and S. Kumar, Dielectric and superparamagnetic behavior of nanocrystalline  $CaFe_2O_4$ , *AIP Conference Proceedings* **2265** (2020) 030118.
  14. **Ganesh Lal**, K. Punia, S. N. Dolia, and S. Kumar, Optical and superparamagnetic behavior of  $ZnFe_2O_4$  nanoparticles, *AIP Conference Proceedings* **1953** (2018) 120021.
  15. K. Punia, **Ganesh Lal**, H. Bhoi and S. Kumar, Influence of annealing on the structural, optical and photoluminescence properties of  $TiO_2$  nanoparticles, *AIP Conference Proceedings* **2265** (2020) 030115.
  16. H. Bhoi, K. Punia, **Ganesh Lal** and S. Kumar, Study of structural, optical and photoluminescence properties of  $Zn_{0.93}Mg_{0.07}O$  nanoparticles, *AIP Conference Proceedings* **2265** (2020) 030117.
  17. H. Bhoi, P. Joshi, K. Punia, **Ganesh Lal** and S. Kumar, Synthesis and Rietveld refinement of MgO nanoparticles, *AIP Conference Proceedings* **2220** (2020) 020109.
  18. P. Joshi, H. Bhoi, S. Tiwari, K. Punia, **Ganesh Lal** and S. Kumar, Synthesis and optical properties of anatase- $TiO_2$  nanoparticles, *AIP Conference Proceedings* **2220** (2020) 020144.

19. K. Punia, **Ganesh Lal**, H. Bhoi and S. Kumar, Synthesis, photoluminescence and CIE chromaticity of nanocrystalline  $Zn_{1-x}Ca_xO$  ( $x=0.02$  &  $0.05$ ), AIP Conference Proceedings **2115** (2019) 030146.
20. K. Punia, **Ganesh Lal** and S. Kumar, Optical absorption and photoluminescence study of nanocrystalline  $Zn_{0.92}M_{0.08}$  (M: Li & Gd), AIP Conference Proceedings **1953**(2018) 030103.
21. K. Punia, **Ganesh Lal**, V. Rathore and S. Kumar, Optical and magnetic behaviour of nanocrystalline 5% Ca doped ZnO, AIP Conference Proceedings **1942** (2018) 050091.

### **List of International/ National Conferences/ Seminar/Workshop/Training Programmes Attended**

1. Completed One Month “*Faculty Induction Programme*” (Blended Mode) (1<sup>st</sup> December to 30<sup>th</sup> December 2022) organised by Mahatma Hansraj Faculty Development Centre Hansraj College, University of Delhi.
2. *Dielectric and superparamagnetic behavior of nanocrystalline  $CaFe_2O_4$* , **Poster presentation** in 64<sup>th</sup> DAE Solid State Physics Symposium (DAE-SSPS 2019) at Indian Institute of Technology Jodhpur, Rajasthan, India during December 18-22, 2019.
3. *Wasp-waisted like magnetic behavior of nanocrystalline  $CoFe_2O_4$  at 5K*, **Poster presentation** in 3<sup>rd</sup> International Conference on Condensed Matter & Applied Physics at Bikaner, India during October 14-15, 2019. (**Received Best Poster Award**)
4. *Effect of Li and Ca Substitution on the Optical and Magnetic Properties of Half Doped Cobalt-Zinc Ferrite Nanoparticles*, **Oral presentation** in National Conference on Recent Advances in Material Science and Technology (NCRAMST-2019) at Department of Physics, University of Rajasthan, Jaipur (India) during February 4-5, 2019.
5. *Structural, Optical and Dielectric Properties of Zinc Ferrite Nanoparticles*, **Poster presentation** in International Conference on Materials for Energy Applications (ICME-18) at S.S. Jain Subodh P.G. (Autonomous) College Jaipur, Rajasthan (India) during December 06-08, 2018.
6. *Influence of Zn Concentration on the Optical and Magnetic Properties of Cobalt-Zinc Nanoferrite*, **Oral presentation** in National Conference on Energy, Material and Sustainable Society (EMSS-2018) at Department of Physics Kanoria PG Mahila Mahavidyalaya, Jaipur, India during January 24-25, 2018.

7. *A comparative study on the temperature and field dependent magnetic properties of nanocrystalline CoFe<sub>2</sub>O<sub>4</sub>, ZnFe<sub>2</sub>O<sub>4</sub> and CaFe<sub>2</sub>O<sub>4</sub>,*  
**Poster presentation** in 21<sup>st</sup> DAE-BRNS Workshop and Symposium on Thermal Analysis at Department of Chemistry, Goa University at Goa, India during January 16-20, 2018.
8. *Structural, Optical and Superparamagnetic Behavior of ZnFe<sub>2</sub>O<sub>4</sub> Nanoparticles,*  
**Poster presentation** in 2<sup>nd</sup> International Conference on Condensed Matter & Applied Physics at Bikaner, India during November 24-25, 2017.
9. *Structural, Optical and Magnetic Properties of Cobalt Ferrite Nanoparticles,*  
**Oral presentation** in 21<sup>st</sup> International Conference of International Academy of Physical Sciences (CONIAPS XXI) on Symbiotic Development of Mathematical, Physical, Chemical & Computational Sciences & Symposium on Recent Advances and Future Direction on Mathematics in Bio-Sciences at Hisar, India during October 28-30, 2017.
10. *Magnetic behaviour of hydrogenated La<sub>0.5</sub>Ca<sub>0.5</sub>MnO<sub>3</sub>,*  
**Poster presentation** in International Conference on Functional Oxides and Nanomaterials 2016 (ICFONM-2016) at Saurashtra University, Rajkot, India during November 11-13, 2016.
11. **“WORKSHOP ON E-RESOURCES”** organized by the University Central Library, Mohanlal Sukhadia University Udaipur, Rajasthan, during 20-28 February, 2017.
12. **“ One Day Awareness Programme on J-Gate Online Resources”** jointly organized by University Central Library, Mohanlal Sukhadia University, Udaipur and Informatics India Ltd. Bangalore held at University Central Library, Mohanlal Sukhadia University, Udaipur, India on January 29, 2016.