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**Residential Address**

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**Academic Qualifications:**

**M.Sc. (H.S.) Physics, Ph. D.**

**Ph. D. Thesis Title:**

Structure and orientational order in pure and  
doped C<sub>60</sub> solids.

**Career Profile:**

Lecturer:	02-11-1999 to 1-11-2005 (P.U.)
Sr. Lecturer	02-11-2005 to 10-5-2009 (P.U.)
Reader	11-5-2009 to 10-5-2012 (P.U.)
Associate Professor	11-5-2012 to 10-5-2015 (P.U.)
Professor	11-5-2015 to Till date (P.U.)

**Courses Taught**

1. Condensed Matter Physics and material Science (UG)
2. Mathematical Physics (PG)
3. Electricity and Magnetism and electronics (UG)
4. Principles of Physics (Quantum and Statistical Mechanics)
5. Physics of Materials and Nanomaterials (M.Tech.)
6. Classical Mechanics(PG)
7. Statistical mechanics (PG)
8. Classical Electrodynamics (PG)
9. Condensed Matter Physics (PG)

# RESEARCH

**Field of specialization:** Theoretical Condensed Matter Physics

## Areas of Interest:

1. Model calculations of molecular solids( Fullerenes)
2. Edohedral Fullerenes , Nanotobes and graphenes
3. Heusler alloys for spintronic applications
4. Dilute magnetic semiconductors
5. Nanocomposits
6. Electronic and Thermoelectric properties of materials such as MgSi
7. Conventional superconductors

## List of the students supervised

S. No.	Degree	Name of the candidate	Topic	status
1	Ph. D.	Ms. Devina Sharma	Size effects in cuprate superconductors and AB-initio study of their electronic properties.	Awarded 2014
2	Ph.D.	Mr. Nibras Mossa Umran	Effect of endohedral doping on C <sub>60</sub> and carbon nanotubes.	Awarded 2014
3	Ph.D.	Ms. Kumari Seema	Structural and electronic properties of Dilute magnetic oxides and Heusler Alloys	Awarded 2014
4	Ph.D.	Ms. Vaneeta Bala	Theoretical and experimental study of semiconductor /polymer nanocomposites	Awarded 2015
5	Ph. D.	Ms. Shobhna Dhiman	Theoretical studies of doped C <sub>60</sub> and carbon nanotubes.	Awarded 2016
6	Ph.D.	Ms. Kulwinder Kaur	Theoretical investigation of thermoelectric materials	Awarded 2017
7	Ph.D.	Ms. Anita Rani	Study of II-VI and III-V Dilute Magnetic Semiconductors	Awarded 2017
8	Ph.D.	Mr. Anil Sonkusare	Development and characterization of porous silicon gas sensor	Registered
9	Ph.D.	Ms. Sarita Mann	Transport properties of doped gaphene	Registered

10	Ph.D.	Mr. Gagandeep Singh	Order disorder phenomena in Mn based Heusler compounds	Registered
11.	Ph.D.	Ms. Anuradha	Thermoelectric properties of Li based compounds	Registered
12	Ph.D.	Mr. Saurav Jain	Magnetic nanoclusters (Tentative)	Registered
13	Ph.D.	Mr. Surinder Singh	Theoretical Study of Conventional Superconductors	Registered
14	Ph.D.	Mr. Deepak Kumar	Terahertz Metamaterials (Tentative)	Registered
1	M.Phil.	Ms. Reena Devi	C, Na and H doped Endohedral C <sub>60</sub> : DFT Calculation	Awarded 2009
2	M.Phil.	Ms. Anita Rani	Structure and electronic properties of doped C <sub>20</sub> fullerenes.	Awarded 2010
3	M. Phill.	Ms. Kumari Seema	Structure of alkaline earth and rare earth doped C <sub>60</sub> solids	Awarded 2010
4	M.Tech. NS&NT	Mr. Dheeraj Sharma	A Study of Electronic properties for Zig-Zag, Armchair & Chiral Carbon-Nanotubes	Awarded 2011
5	M.Tech. NS&NT	Ms. Harkiran Kaur	Alkali Metal doped Endohedral Fullerenes	2008
6	M.Tech. NS&NT	Ms. Lavnya Khanna and Harkiran Kaur	Density functional theory- A tool for simulation of Nano systems	2008
1	M.Sc.	Ms. Rashim	Stability of Na clusters inside C <sub>84</sub>	2008
2	M.Sc.	Ms. Amandeep	Dependence of binding energy and HOMO- LUMO gap on shape and size of metal clusters	2011
3	M.Sc.	Ms. Mandeep Kaur	Structure and electronic properties of Full Heusler Alloy Co <sub>2</sub> MnSi	2012
4	M.Sc.	Ms. Priyanka	Calculation of elastic constants of C <sub>60</sub> solid	2014
5	M.Sc.	Ms. Gurpal Singh	Study of Thermal properties of Mg <sub>2</sub> Si and Mg <sub>2</sub> Ge	2015
6	M.Sc.	Ms. Sofia	Thermoelectric properties of Topological semi-metals	2016
7	M.Sc.	Mr. Sukhwinder Singh	Half Heusler compounds as thermoelectric materials	2016
8	M.Sc	Ms. Chanchal	Magnetism in endohedral doped C <sub>20</sub>	2017

## Membership of Professional Societies:

1. Life member of Indian Physics Association (IPA)
2. Life Member of Indian Association of Physics teachers (IAPT)
3. Local coordinator to conduct NGPE Examination.
4. Founder member and secretary of Chandigarh Vigyan Parishad

## PUBLICATIONS

### Journals

1. Room Temperature Ammonia Gas Sensing Using Polyaniline Nanoparticles Based Sensor  
Anil G. Sonkusare, Sachin Tyagi, **Ranjan Kumar**, Sunita Mishra, *Int. J of Materials Science* 12(2017)283
2. Unraveling the effect of uniaxial strain on thermoelectric properties of  $Mg_2Si$ : a DFT study,  
Kulwinder Kaur, **Ranjan Kumar**, *Chin. Phys. B* 26 (2017) 066401
3. Sb Substitution effect on thermoelectric properties of  $Mg_2Si$ , Kulwinder Kaur and **Ranjan Kumar**,  
*J of Electronic Materials* DOI: 10.1007/s11664-017-5482-0
4. Hydrostatic Pressure effect on  $Ga_{0.75}Cr_{0.25}As$  DMS: DFT Study, Anita Rani and **Ranjan Kumar**, *J Supercond Novel Mag*, DOI 10.1007/s10948-017-4110-9
5. Optimized interaction parameters for metal doped endohedral fullerenes, Shobhna, **Ranjan Kumar**, Keya Dharamvir, *Appl Nanosci* 7(2017)137
6. Small Al and Ga clusters trapped inside the Bucky-ball ( $C_{60}$ ) — A DFT study, Dhiman Shobhna, Ranjan Kumar, Dharamvir Keya, *Int. Journal of Modern Physics B* 30 (2017) 1750092
7. Scrutinize the effect of Ge and Sn doping on  $MgSi$  for energy harvesting applications, Kulwinder Kaur, **Ranjan Kumar**, *Indian Journal of Physics*, DOI 10.1007/s12648-017-1028-9
8. DFT Study of Hydrostatic Pressure Effect on  $Cd_{1-x}Z_x$  ( $Z = Cr, Mn; X = S, Se$ ) DMSs, Anita Rani and **Ranjan Kumar**, *J Supercond Nov Magn* DOI 10.1007/s10948-017-4022-8
9. Enhancement of figure of merit (ZT) by doping Bi in  $Mg_2Si$  for energy harvesting applications  
Kulwinder Kaur, **Ranjan Kumar**, *Progress in Natural Science: Materials International* 26 (2016) 533
10. Emergence of thermoelectricity in Half Heusler topological semimetals with strain, Kulwinder Kaur, Shobhna Dhiman and **Ranjan Kumar**, *Physics Letters A* 381 (2017) 339
11. LDA+U Study of Induced Half Metallicity in Cr-Doped GaN, Anita Rani and **Ranjan Kumar**, *J*

12. Quest of thermoelectricity in topological insulators: A density functional theory study, Sukhwinder Singh, Kulwinder Kaur, **Ranjan Kumar**, *Applied surface science (in Press)* <http://dx.doi.org/10.1016/j.apsusc.2016.10.210>
13. Study of half-metallic ferromagnetism and elastic properties of  $Cd_{1-x}Cr_xZ$  ( $Z=S, Se$ ), Anita Rani and **Ranjan Kumar**, *Appl. Phys. A* (2016) 122:1004 DOI 10.1007/s00339-016-0533-6
14. Study of Structural and Electronic Properties of Doped Arm Chair Single-Walled Carbon Nanotubes, Shobhna Dhiman, **Ranjan Kumar** and Keya Dharamvir, *Materials Today: Proceedings* 3 (2016) 1820–1827
15. DFT Study of Diluted Magnetic Semiconductor  $Cd_{1-x}Cr_xS$  at  $x=3.125$ , Anita Rani, **Ranjan Kumar**, *Materials Today: Proceedings* 3 (2016) 1815–1819.
16. Electronic and Thermoelectric Properties of Al doped  $Mg_2Si$  Material: DFT Study, Kulwinder Kaur, **Ranjan Kumar**, *Materials Today: Proceedings* 3 (2016) 1785–1791.
17. Thermodynamic properties of pure and doped (B, N) graphene, Sarita Mann, Pooja Rani, **Ranjan Kumar**, Girija S. Dubey and V. K. Jindal, *RSC Adv.*, 6(2016) 12158
18. Effect of Pressure on electronic and thermoelectric properties of Magnesium silicide : a DFT study, Kulwinder Kaur and Ranjan Kumar, *Chin. Phys. B*, 25, No. 2 (2016) 056401
19. First principle investigation of the electronic and thermoelectric properties of  $Mg_2C$ , Kulwinder Kaur and **Ranjan Kumar**, *Chin. Phys. B* Vol. 25, No. 2 (2016) 026402
20. Effect of Disorder on Electronic, Magnetic, and Optical Properties of  $Co_2CrZ$  Heusler Alloys ( $Z = Al, Ga, Si, Ge$ ), K Seema, N. M. Umran and **Ranjan Kumar**, *J Supercond Nov Magn*, 29 (2016) 401
21. Electrical Properties of pure and (Al, Ga & In) doped  $CdS/PVA$  Nanocomposites, Vaneeta Bala, Mamta Rani, Surya Tripathi and **Ranjan Kumar**, *Mater. Res. Express* 2 (2015) 095016
22. DFT study of Cu and Ag clusters inside  $C_{60}$ , Shobhna Dhiman, **Ranjan Kumar** and Keya Dharamvir, *Journal of Molecular Structure* 1100 (2015) 328
23. Stability and electronic properties of  $Cd_{0.75}Mn_{0.25}S$  and  $Cd_{0.75}Mn_{0.25}Se$  in B3 Phase, Anita Rani and **Ranjan Kumar**, *Appl. Phys. A* 120, (2015) 775-784
24. Effect of Dopant Concentration on Electronic and Magnetic Properties of Transition Metal-Doped  $ZrO_2$ , K. Seema and **Ranjan Kumar**, *J Supercond Nov Magn*, 28 (2015) 2735
25. Study of endohedral doped  $C_{60}$  fullerene using model potentials, N M Umran, Narinder Kaur, K Seema and **Ranjan Kumar**, *Mater. Res. Express* 2 (2015) 055603
26. Optical properties of Ga and In doped  $CdS$  nanocomposites: An experimental and first principles study, Vaneeta Bala, S.K. Tripathi and **Ranjan Kumar**, *Material Letters*, 149 (2015) 18-21
27. Effect of encapsulation (Au&TI) molecule in fullerene  $C_{60}$  on electronic and magnetic properties, Nibras Mossa Umran and **Ranjan Kumar**, *Quantum Matter*, 4 (2015), 1–5.

28. Effect of Variation in Dilute Limit on Electronic and Magnetic Properties of Transition Metal doped  $\text{HfO}_2$ , K Seema and **Ranjan Kumar**, *Quantum Matter*, 4 (2015), 1–6.
29. Electronic structure and magnetic properties of quaternary Heusler alloy  $\text{Co}_2\text{CrGa}_{1-x}\text{Ge}_x$  ( $x=0-1$ ), K Seema, **Ranjan Kumar**, *J Magnetism and Magnetic Materials*, 377 (2015) 70-76.
30. Structural and electronic properties of endohedral doped SWCNTs: A DFT study, Nibras Mossa Umran, Vaneeta Bala, K. Seema and **Ranjan Kumar**, *Physica E*, 65 (2015) 68-76
31. Correlation of photoluminescence quenching with Charge Transport in groupIII (Al,Ga&In) elements doped CdS/PVANCs: Experimental and First Principles Studies, Vaneeta Bala, S.K. Tripathi and **Ranjan Kumar**, *Materials Letters*,132 (2014) 38–40
32. Investigations of Al:CdS/PVA nanocomposites: A joint theoretical and experimental approach, Vaneeta Bala, Mamta Sharma, S.K. Tripathi and **Ranjan Kumar**, *Materials Chemistry and Physics*, 146(2014) 523-530
33. Cyclic Voltammetry of Doped CdS Nanocomposites: Relation Between Theoretical and Experimental Band Gap, Vaneeta Bala, S. K. Tripathi, and **Ranjan Kumar**, *Journal of Nanoengineering and Nanomanufacturing*, 4 (2014)1-4
34. Theoretical investigation of endohedral complexes of Si and Ge with  $\text{C}_{60}$  molecule, Nibras Mossa Umran and **Ranjan Kumar**, *Physica B*, 437(2014) 47–52
35. Half-metallic behavior of  $\text{Co}_2\text{YZ}$  ( $Y = \text{V, Cr}$ ;  $Z = \text{Al, Ga}$ ) under pressure: a DFT study, K Seema and **Ranjan Kumar**, *Appl. Phys. A* 116 (2014) 1199
36. Investigation of the electronic, magnetic and optical properties of  $\text{Co}_2\text{CrZ}$  ( $Z = \text{Si, Ge}$ ) under pressure—a density functional theory study, K Seema and **Ranjan Kumar**, *Phys. Scr.* 89 (2014) 015801
37. First principal study of Fe based Full Heusler Alloys, Kumari Seema and **Ranjan Kumar**, *J. integ. Sci. Technol.*,1(2013) 41
38. AC and DC susceptibility study of sol gel synthesized  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+6}$  Superconductor, Devina Sharma, **Ranjan Kumar** and V.P. S. Awana, *Ceram. Int.* 39 (2013) 1143
39. Temperature and field dependence of thermally activated flux flow resistance in  $\text{Bi}_2\text{Sr}_2\text{CaCu}_2\text{O}_{8+6}$  superconductor, Devina Sharma, **Ranjan Kumar** and V.P. S. Awana, *Solid State Communications* 152 (2012) 941
40. Structure and electronic properties of  $\text{H}_n@\text{C}_{20}$  molecule, **Ranjan Kumar** and Anita Rani, *Physica B* 406 (2011) 1173
41. Comparative experimental and density functional theory study of the physical properties of  $\text{MgB}_2$  and  $\text{AlB}_2$ , Devina Sharma, Jagdish Kumar, Arpita Vajpayee, **Ranjan Kumar**, P.K. Ahluwalia and V.P.S. Awana, *J. Supercond. Nov. Magn.* 24 (2011) 1925
42. Structure of alkaline-earth and rare earth metal doped  $\text{C}_{60}$  solids, Kumari Seema and **Ranjan Kumar**, *Phys. Scr.* 83 (2011) 025603
43. Influence of grain size on the superconductivity of  $\text{La}_{1.85}\text{Sr}_{0.15}\text{CuO}_4$ , Devina Sharma, **Ranjan Kumar**, H. Kishan and V.P.S. Awana, *J. Supercond. Nov. Magn.* 24 (2011) 205

44. Structure and stability of endohedral  $C_n@C_{60}$ , Reena Devi and **Ranjan Kumar**, *Modern Physics Letters B* 24 (2010)1255.
45. Phonon dynamics and thermodynamical properties of alkali metal doped  $MC_{60}$  compounds, D. Varshney, Rajendra K. Jain, **K. Ranjan**, Keya Dharamvir and V. K. Jindal, *Modern Physics Letters B* 23 (2009)2557
46. Zinc phthalocyanine thin film and chemical analyte interactions studies by density functional theory and vibrational techniques, G S S Saini, Sukhwinder Singh, Sarvpreet Kaur, **Ranjan Kumar**, Vasant Sathe and S K Tripathi, *J. Phys.: Condens. Matter* 21 (2009) 225006
47. Stability of Na metal clusters inside  $C_{84}$  and  $C_{60}$ , **Ranjan Kumar** and Harkiran Kaur, *Materials Science- an Indian Journal*, 5 (2009) 62
48. Stability of Na and H atoms inside  $C_{60}$  Molecule – DFT Calculations, Reena Devi and **Ranjan Kumar**, *Pb. Univ. Res. J (Sci.)* 58 (2008)217
49. Charge Transfer in endohedral Na doped  $C_{240}$  molecule, **Ranjan Kumar**, Harkiran Kaur and Keya Dharamvir, *Pb. Univ. Re. J (Sci.)* 58 (2008)207
50. Comparative study of alkali doped  $C_{60}$  solids, **K. Ranjan**, K. Dharamvir and V. K. Jindal, *Physica B*, 371 (2006)232
51. Bulk Properties of alkali doped  $C_{60}$  solids, **K. Ranjan**, K. Dharamvir and V. K. Jindal, *Indian J. of Pure & Applied Physics*, 43 (2005)654
52. Cohesive energy of potassium doped  $C_{60}$  solids, **K. Ranjan**, K. Dharamvir and V. K. Jindal, *Physica B*, 365 (2005)121
53. Orientational ordering and binding in alkali doped  $C_{60}$  solids, **K. Ranjan**, Sarabpreet Singh, K. Dharamvir and V. K. Jindal *Indian J. of Engineering & Materials Sciences*, 7 (2000)320.

## Conference Proceedings

1. Binding in doped  $C_{60}$  solids- Effect of Coulomb correlation, **K. Ranjan**, K. Dharamvir and V. K. Jindal, *Proceedings of the DAE- Solid state Physics symposium (India)* (1998) 335
2. Madelung constant of some alkali doped  $C_{60}$  systems, **K. Ranjan**, K. Dharamvir and V. K. Jindal, *Proceedings of the DAE- Solid state Physics symposium (India)* (2002) 359
3. Effect of alkali metal (M) on the structure of  $M_nC_{60}$  solids, **K. Ranjan**, K. Dharamvir and V. K. Jindal, *Proceedings of the DAE- Solid state Physics symposium India* (2005) 561
4. Structure and ionicity of Na doped  $C_{60}$  solids, **K. Ranjan**, Keya Dharamvir and V. K. Jindal, *Chandigarh Science Congress (2007)*
5. Thermodynamics of  $RbC_{60}$  solid in FCC phase, **K. Ranjan**, N. Kaurav, D Varshney, K. Dharamvir and V. K. Jindal, *Proceedings of the DAE- Solid state Physics symposium India* (2007) 729
6. Stability of Na clusters inside  $C_{240}$  molecule, Harkiran Kaur, **K. Ranjan** and Keya Dharamvir, *Recent*

- Advances in Innovative Materials (RAIM-08)* Excel India Publishers, (2008) 260.
7. Carbon clusters inside  $C_{60}$  molecule- a DFT Calculation, Reena Devi and **Ranjan Kumar**, *Proceedings of the DAE- Solid state Physics symposium India* (2008).
  8. Structure of silicon clusters- A DFT calculation, Harkiran Kaur , Lavanya Khanna and **Ranjan Kumar**, *Chandigarh Science Congress* (26-28, Feb, 2009)
  9. Effect of interaction parameters on the thermodynamics of  $RbC_{60}$ , **Ranjan Kumar**, N. Kaurav, D. Varshney, Keya Dharamvir and V. K. Jindal, *Proceedings of National conference on Recent Advances in Condense Matter Physics, 23-24 May, 2009. pp 51*
  10. Adsorption of H atoms inside  $C_{20}$  molecule, Anita Rani, Shobhna Dhiman and **Ranjan Kumar**, *Proceedings of the DAE- Solid state Physics symposium India* (2009) 373
  11. Bulk Properties of Ba and Sr doped  $C_{60}$  solids, K. Seema and **Ranjan Kumar**, *Proceedings of the DAE- Solid state Physics symposium India* (2009) 731
  12. Stability of nitrogen substituted  $C_{20}$  fullerene: DFT calculations, Anita Devi, Shobhna Dhiman and **Ranjan Kumar**, *Chandigarh science congress, 2010.*
  13. Influence of grain size on the superconductivity of  $La_{1.85}Sr_{0.15}CuO_4$  Devina Sharma, **Ranjan Kumar**, H Kishan and VPS Awana, International Conference on Superconductivity and Magnetism (ICSM), Antalya, Turkey, (April 25-30, 2010)
  14. Impact of particle size on the magneto-transport properties of  $La_{1.85}Sr_{0.15}CuO_4$  Devina Sharma, **Ranjan Kumar** and VPS Awana, *International conference on quantum effects in solids of today (I-CONQUEST), National Physical Laboratory, New Delhi, (20-23 Dec, 2010)*
  15. Density Functional study of perovskite superconductor  $MgCNi_3$ , Jagdish Kumar, Devina Sharma, **Ranjan Kumar**, P K Ahluwalia and VPS Awana, *AIP Conference proceedings (ICACNM-2011) 1393, 197-198*
  16. Electronic properties of Carbon nanotubes using density functional theory, Shobhna Dhiman, Dheeraj Kumar, Nibras Mossa Umran and **Ranjan Kumar**, *AIP Conference proceedings (ICACNM-2011) 1393, 357-358*
  17. Structural and electronic properties of  $C_{20-n}Si_n$  ( $n=1-10$ ), Anita Rani, Seema Rani, Vaneeta Bala and **Ranjan Kumar**, *AIP Conference proceedings (ICACNM-2011) 1393, 231-232*
  18. Inter and intra granular properties of  $La_{1.85}Sr_{0.15}CuO_4$  Superconductors as influenced by varying grain size, Devina Sharma, **Ranjan Kumar** and VPS Awana, *AIP Conference proceedings (ICACNM-2011) 1393, 233-234*
  19. Sensing of ammonia based on porous silicon sensor, Anil G. Sonkusare, Amit L Sharma, **Ranjan Kumar** and Sunita Mishra, *AIP Conference proceedings (ICACNM-2011) 1393, 359-360*
  20. Structure and Electronic properties of  $c-HfO_2$ , Seema Kumari and **Ranjan Kumar**, *International*



- conference on Current Developments in Atomic, Molecular, Optical and Nano Physics, D. U. Delhi( 14-16, Dec,2011)*
21. The Structural and Electronic Properties of  $\text{HfO}_2$ , K. Seema, **Ranjan Kumar**, *AIP Conf. Proc. 1447, 1077 (2012). The DAE Solid State Physics Symposium (DAE - SSPS 2011), 19-23rd Dec. 2011, held at SRM university, Chennai.*
  22. Ab-initio Study of Chromium doped Cubic Hafnia, K. Seema, **Ranjan Kumar**, *CHASCON-2012, 26-28<sup>th</sup> Feb.2012, Panjab University, Chandigarh.*
  23. Search for ferromagnetism in transition metal doped monoclinic  $\text{HfO}_2$ , K. Seema, **Ranjan Kumar**, *AIP Conf Proc. 1512, 1176 (2013). The DAE Solid State Physics Symposium (DAE - SSPS 2012), 3-7<sup>th</sup> Dec. 2012, held at IIT Bombay, Mumbai.*
  24. Study of quaternary Heusler alloy  $\text{Co}_2\text{CrAl}_{1-x}\text{Si}_x$ , K. Seema, **Ranjan Kumar**, *AIP Conf Proc. 1512, 1154 (2013). The DAE Solid State Physics Symposium (DAE - SSPS 2012), 3 – 7 Dec. 2012, held at IIT Bombay, Mumbai.*
  25. Study of AlN Nanotubes, Vaneeta Bala, Nibras Mossa Umran and **Ranjan Kumar** in 6<sup>th</sup> *Chandigarh Science Congress (CHASCON) held at P.U. Chandigarh. (Feb. 26-28, 2012).*
  26. DFT Study of CdS-PVA film, Vaneeta Bala, S. K. Tripathi and **Ranjan Kumar**, *International Conference on Materials Science and Technology (ICMST 2012) held at Department of Physics, St. Thomas College, Pala, Kerala (June 10 – 14, 2012).*
  27. Effect of sintering temperature on the nature of weak links and flux pinning mechanism in  $\text{La}_{1.85}\text{Sr}_{0.15}\text{CuO}_4$  superconductor, Devina Sharma, **Ranjan Kumar** and V P S Awana, *International Conference on Materials Science and Technology (ICMST-2012) held at Department of Physics, St. Thomas College, Pala, Kerala (June 10 – 14, 2012).*
  28. Structural and Electronic Properties of N Substituted  $\text{C}_{20}$  Fullerene, Anita Rani, Shobhna Dhiman, and **Ranjan Kumar**, *International Journal of Nanotechnology and Applications ISSN 0973-631X Volume6, Number 3, 11-15 (2012)*
  29. Computational studies of polyvinyl alcohol encapsulated tetrahedral cadmium sulphide cluster, Vaneeta Bala, S. K. Tripathi and **Ranjan Kumar**, *AIP Conf. Proc. 1536, 301 (2013).*
  30. An ab-initio study of full Heusler alloy  $\text{Fe}_2\text{CoGa}$ , K. Seema, **Ranjan Kumar**, *AIP Conf Proc. 1536, 805 (2013).*
  31. Influence of Al doping on Optical properties of CdS/PVA Nanocomposites: Theory and Experiment, Vaneeta Bala, S. K. Tripathi and **Ranjan Kumar**, to be published in *AIP Conf. Proc. 1591, 456(2014)*

32. Pressure Dependence of Half Metallic Behavior of  $\text{Co}_2\text{VZ}$  ( $Z=\text{Si, Ge}$ )-An *ab initio* Study, K. Seema, **Ranjan Kumar**, AIP Conference Proceedings **1591**, 1414 (2014).
33. Effect on magnetic properties of germanium encapsulated  $\text{C}_{60}$  Fullerene, Nibras Mossa Umran, **Ranjan Kumar**, AIP Conf. Proc, , 2013, 1512, 264-265.
34. Ab initio Study of Structural and Electronic Properties of  $\text{Cu}_n@C_{60}$  Shobhna Dhiman, **Ranjan Kumar** and Keya Dharamvir, AIP Conference Proceedings **1536**, 847 (2013)
35. Density functional Study of Structural and Electronic Properties of  $\text{Al}_n@C_{60}$ , Shobhna Dhiman, **Ranjan Kumar** and Keya Dharamvir, *AIP Conf. Proc* 2014, 1591,1106-1108.
36. Ab initio study of nitrogen –multisubstituted neutral and positively charged  $\text{C}_{20}$  fullerene, Anita Rani and **Ranjan Kumar**, *AIP Conf. Proc* 2014, 1591, 580-582
37.  $\text{Cd}_{0.9375}\text{Mn}_{0.0625}\text{S}$  diluted magnetic semiconductor: A DFT study, Anita Rani, Kulwinder Kaur, and **Ranjan Kumar**, AIP Conference Proceedings 1675, 030033 (2015)
38. Thermoelectric properties of Al doped  $\text{Mg}_2\text{Si}$  material, Kulwinder Kaur, Anita Rani, and **Ranjan Kumar**, AIP Conference Proceedings 1675, 030023 (2015)
39. Effect of disorder on electronic and magnetic properties of  $\text{Co}_2\text{VGa}$  Heusler alloy, K. Seema and **Ranjan Kumar**, AIP Conference Proceedings 1675, 030036(2015)
40. Silver clusters encapsulated in  $\text{C}_{60}$ : A density functional study Shobhna Dhiman, **Ranjan Kumar**, and Keya Dharamvir, AIP Conference Proceedings 1675, 020004 (2015)
41. DFT study of CdS-PVA film, Vaneeta Bala, S K Tripathi and **Ranjan Kumar**, IOP Conf. Series: Materials Science and Engineering 73 (2015) 012118
42. DFT study of Al doped armchair SWCNTs, Shobhna Dhiman, Anita Rani, **Ranjan Kumar**, Keya Dharamvir, AIP Conference Proceedings **1731**, 050114 (2016).
43. Effect of hydrostatic pressure on the structural and electronic properties of  $\text{Cd}_{0.75}\text{Cr}_{0.25}\text{S}$ , Anita Rani, Kulwinder Kaur, Shobhna Dhiman, **Ranjan Kumar**, AIP Conference Proceedings **1731**, 120023 (2016).
44. Ab –initio study of thermoelectric properties of  $\text{Mg}_2\text{Ge}$ , Kulwinder Kaur and **Ranjan Kumar**, AIP Conference Proceedings **1731**, 120017 (2016)

## Invited and Extension Lectures

### a) Invited Talks

SN	Title of Lecture/	Title of Conference/Seminar etc	Date(s) of the event	Organised by	Whether International/
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	<b>Academic Session</b>				<b>National</b>
1	Electronic properties of doped fullerenes using DFT	National seminar on Experimental and computational Techniques in Material Science ( ECTMS-2012)	March 31 to April 02, 2012	Deptt. of Physics, H P U Shimla	National
2	CNTs, Graphene and their applications	Faculty development programme on Nanotechnology: Developments and challenges	May 12-16, 2014	Department of applied sciences, National Institute of technical teachers training and research (NITTR)	National
3	Research methodology in sciences	Refresher course on research methodology in sciences	June 11, 2014 to July 01, 2014	Department of Physics, Kurukshetra University, Kurukshetra (Haryana)	National
4	Characterizing materials and Nanomaterials with Density Functional Theory	Department Seminar/Colloquium	Feb 06, 2015	Deptt. of Physics, Panjab University Chandigarh	National
5	Carbon based Nanomaterials & their applications	Faculty development programme on Nanotechnology	Nov.16,2015	Department of applied sciences, National Institute of technical teachers training and research (NITTR)	National
6	Nanomaterials & their applications	Faculty development programme on Nanotechnology	Nov.21, 2016	Department of applied sciences, National Institute of technical teachers training and research (NITTR)	National
7	Carbon based Nanomaterials	Faculty development programme on: Nanotechnology : Developmant & Applications	May 22, 2017	Department of applied sciences, National Institute of technical teachers training and research (NITTR)	National
8	Research Methodology in Sciences	Refereshner Course: Research methodology in Physical and Life sciences	May, 26, 2017	Deptt. of Physics, Panjab University Chandigarh	National
9	Exploring Nanomaterials using DFT	Faculty development programme	March 10, 2017	Deptt. of Electronic Sciences, Kurukshetra Univ. Kurukshetra	National
10	Endohedrally doped fullerenes: a DFT Study	International Conference on Advances in Functional materials	Jan 6-8, 2017	Central Univ. of Tamilnadu and Anna University, Chennai	International

## b) Extension Lectures

SN	Title of Lecture/ Academic Session	Title of Conference/Seminar etc	Date(s) of the event	Organised by	Whether International/ National
1	General science and its importance	Extension lecture	12-02-2013	Khalsa college for women, Sidhwan Khurd, Ludhiana (Pb.)	National
2	Rotational Motion	In service Course	Dec. 27, 2016	Kendriya Vidyalaya 3 BRD AFS Chandigarh	National
3	Condensed Matter Physics		June, 2015	SERC, Solan, HP	State

### Conferences Organised

1. Organized International conference on Advances in condensed and Nanomaterials ( ICACNM-2011) as secretary, Feb. 2011
2. Member LOC of 1st IAPT national student symposium on Physics ( 2013)
3. Member of Local organizing committee of 2nd IAPT National student symposium on Physics, Deptt. Of Physics, P. U. Chandigarh hel on 17-19 January 2014.
4. Member of Local organizing committee of International Seminar on Current Trends in Quantum Gases, BEC and Solitons, Department of Physics, Panjab University, Chandigarh, 3-6 March 2014

### Conferences/seminars/workshops attended

1. DAE solid state physics symposium, K. U. Kurukshetra, Dec, 1998
2. National conference on recent developments in disordered materials, Deptt. of Physics, P. U. Chd., 15-16, March 2001
3. Seminar on computational techniques in Physics, Deptt. of Physics, P. U. Chandigarh, 6-7, March 2002
4. DAE solid state physics symposium, K. U. Kurukshetra, Dec, 2002
5. 91<sup>st</sup> Session of Indian Science Congress association , Panjab Univ. Chandigarh, 3-7, Jan, 2004
6. DAE solid state Physics Symposium, BARC Mumbai, 5-9, Dec. 2005
7. Ist Chandigarh Science Congress, 10-11 March, 2007
8. National conference on Recent advances in innovative materials, NIT, Hamirpur,

May, 2008

9. National conference on Recent advances in condensed matter Physics, NIT, Hamirpur, 23-24 May, 2009
10. 3<sup>rd</sup> Chandigarh science congress, P. U. Chd., 26-28, Feb, 2009
11. 54<sup>th</sup> DAE solid state Physics Symposium, M S Univ. of Baroda, 14-18, Dec, 2009
12. 4<sup>th</sup> Chandigarh Science Congress, 19-20 March 2010
13. Seminar cum workshop on First principle and other simulation methods in condensed matter physics, H. P. U. Shimla, 22-29 March, 2010
14. Internantional conference on advances in condensed and nano materials, P. U. Chd., 22-26, Feb., 2011
15. 5<sup>th</sup> Chandigarh science Congress, P. U. Chd.26-28 Feb, 2011
16. International conference on Frontiers in Nanoscience nanotechnology and their applications, p. U. Chd. 16-18 Feb., 2012
17. 6<sup>th</sup> Chandigarh Science Congress, P. U. Chd. 26-28 Feb., 2012
18. National seminar on Experimental & computational techniques in material science, H. P.U. Shimla, 31-3-2012 to 2-4-2012
19. 58<sup>th</sup> DAE solid ate Physics Symposium, Thapar Univ. Thapar, 17-21 Dec, 2013
20. National conference on Physics of engineering materials, DCRUST, Murthal, 15-17 March, 2013
21. 7<sup>th</sup> Chandigarh Science Congress, P. U. Chd. 1-3 March, 2013
22. 8<sup>th</sup> Chandigarh Science Congress, P. U. Chd 26-28 Feb, 2014
23. Conclave on science Education- A manifesto for India's Future 29 Nov., 2014
24. NanoSciTech 2014, P. U. Chd., 13-15 Feb, 2014
25. International conference on condensed matter physics, H P U Shimla, 4-6 Nov., 2014
26. 9<sup>th</sup> Chandigarh Science Congress, P. U. Chd, 25-27 Feb, 2015
27. Workshop on High Performance Computing, deptt. of Physics, P. U. Chd, 16-17 March 2015
28. 10<sup>th</sup> Chandigarh Science Congress, P. U. Chd, 29 Feb- 02 March, 2016