

## Curricula Vitae

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**Dr. Anita Rani** (Assitant Prof. in Physics)  
HOD, Department of Basic Sciences,  
Guru Nanak College for Girls, Sri Muktsar Sahib (Punjab)  
**Area of Interest:** Solid State Physics  
**Office Ph:** +91-1633260229  
**Mobile:** +91-8968465114  
**Email:** [ranianita64@gmail.com](mailto:ranianita64@gmail.com)



### Career Objective

**“Want to serve my Society and Country through Teaching and Research.”**

### Academic Background

- **B.Sc.(Non-Medical)**  
**College:** G.C.W. Ludhiana (Pb.)  
**University:** Panjab University, Chandigarh  
**Year of completion:** 2006.
- **M.Sc.(Physics) with DISTINCTION and RANK-1**  
**College:** Khalsa College, Amritsar  
**University:** G.N.D.U., Amritsar  
**Year of completion:** 2008.
- **Master of Philosophy (Physics)**  
**Thesis Title:** DFT study of C20 fullerenes.  
**Specialization:** Solid State Physics  
**University:** Panjab University, Chandigarh  
**Supervisor:** Prof. (Dr.) Ranjan Kumar  
**Year of completion:** 2009
- **Doctor of Philosophy (Ph.D)**

**Thesis Title:** Study of II-VI and III-V Dilute Magnetic Semiconductors.

**Specialization:** Solid State Physics

**University:** Panjab University, Chandigarh

**Supervisor:** Prof. (Dr.) Ranjan Kumar

**Year of completion:** 2017

## **Achievements and Awards**

- Gold Medal for being a topper in M.Sc.(Physics) by Khalsa College, Amritsar.
- Cleared CSIR-LS National Eligibility Test (NET-2005), jointly conducted by University Grant Commission and Council of Scientific and Industrial Research, India.
- Member of IAPT (Indian Association of Physics Teachers).
- Member Board of Studies, P.G. Department of Physics, Khalsa College Amritsar (Autonomous College) 2016-18.
- Received Appreciation Certificate from Department of Atomic Energy, Bhabha Atomic Research, Centre, Mumbai, to review the manuscript in DAE symposium held at KIIT University, Bhubneshwar 26-30/12/2016.
- Approved Supervisor to guide Ph.D research scholars, of Department of Physics, Panjab University, Chandigarh.
- Received Reviewer Certificate from Department of Atomic Energy, Bhabha Atomic Research, Centre, Mumbai, to review the manuscript in DAE symposium held at Bhabha Atomic Research Centre 26-30/12/2017.
- Chief Editor of Souvenir cum Abstract Book of National Seminar “ Emerging Research Trends in Experimental Physics” held at Guru Nanak College for Girls, Sri Muktsar Sahib on 22-02-2019.
- Convener of One day National Seminar “ Emerging Research Trends in Experimental Physics” held at Guru Nanak College for Girls, Sri Muktsar Sahib on 22-02-2019 sponsored by College development council, Panjab University Chandigarh with grant Rs. 40,000.
- Convener of Two days National Workshop on “ Nuclear Science and Applications of Radioisotopes” jointly organized by Guru Nanak College for Girls, Sri Muktsar Sahib and Indian association of Nuclear Chemists and Allied Scientist (IANCAS), BARC, Mumbai on 9-10-March,2019, sponsored by DAE-BRNS, Bhabha Atomic Research Centre, Mumbai.
- Prepared and Submitted Proposal to UGC for UGC Skill Development Courses (B.VOC and Courses under Community College Scheme) and College received a Grant of Rs. 1.95 lakh (

One Crore ninty five Lakh) for B.Voc courses and 50 lakh for CC courses from UGC, in August 2018.

- Prepared and Submitted Proposal to UGC for Unnat Bahrat Abhiyan Scheme, College received grant Rs. 50,000.
- Prepared and Submitted Proposal to UGC for UGC Skill Development 05 Certificate Courses under Community College Scheme on July 2019. And Courses have been approved
- Received ‘Certificate of Reviewer’ in recognition of reviewing contributed to the journal of physics B (September-2017 (4 reviews)
- Received ‘Certificate of Reviewer’ in recognition of reviewing contributed to the journal of physics and chemistry solids (june-2019(1 review)
- Convener, DST Inspire Camp held on 23-27-2019, at Guru Nanak College for Girls, Sri Muktsar sahib. (Reference No. DST/INSPIRE/01/2019-000256) dated 16-08-2019.
- **Best Teacher Award:** Awarded by Principal and Managing committee Guru Nanak College for Girls, Sri Muktsar Sahib on 29-02-2020.
- Received ‘Certificate of Reviewer’ in recognition of reviewing contributed to the journal of superconductivity and Novel Magnetism (04-03-2020)

### **Teaching Experience & Subjects taught**

1. Department of Physics, Baba Farid College Deon Bathinda (11-01-2010 to 22-09-2011)
2. Department of Physics, Guru Nanak College for Girls, Sri Muktsar Sahib (27-09-2011 to till date)

### **Subjects Taught:**

- **Undergraduate :** All Physics Papers of B.Sc. (N.M) -I,II,III
- **Postgraduate:** Solid State Physics, Computational Physics, Quantum Mechanics

### **Membership in College Committees**

- Head of the Department
- Nodal officer UGC Skill development Courses
- Member NAAC Steering Committee
- Member IQAC Committee
- In charge UGC Grants
- Member Library Advisory Committee
- Member Research Committee
- Member College fee committee
- Member college Purchase Committee

### **Research Work**

**A. Research Projects:** Distinct Research Study project funded by the Deanship of Scientific Research (DSR), King Abdulaziz University, Jeddah, South Arabia under grant No. (130 - 247 - D1440)

**B. Research Guidance:** One student is pursuing Ph.D under the supervision.

### **C. Research Papers Published in International Refereed Journals**

1. Kumar R., **Rani A.**, “Structural and Electronic Properties of  $H_n@C_{20}$ ” *Physica B* **406** (2011) 1173. Q
2. **Rani A.**, Kumar R., “Stability and electronic properties of  $Cd_{0.75}Mn_{0.25}S$  and  $Cd_{0.75}Mn_{0.25}Se$ ” in B3 phase in journal of *Appl.Phys. A* (2015)
3. **Rani A.**, Kumar R., “DFT Study of Diluted Magnetic Semiconductor  $Cd_{1-x}Cr_xS$  at  $x=3.125\%$ ” in *Journal of Materials today* (2015).
4. **Rani A.**, Kumar R., Emergence of half-metallic ferromagnetism in  $Ga_{1-x}Cr_xAs$ , *Appl.Phys. A* (ISSN 0947-8396) (2016) 10.1007/s00339-016-0270-x.
5. Rani A., Kumar R., Study of half-metallic ferromagnetism and elastic properties of  $Cd_{1-x}Cr_xZ$  ( $Z=S, Se$ ) *Applied Physics A* (Dec. 2016)
6. Rani A., Kumar R., LDA + U Study of Induced Half Metallicity in Cr-Doped GaN *Journal of Superconductivity and Novel Magnetism* (Dec. 2016)
7. Rani A., Kumar R., DFT Study of Hydrostatic Pressure Effect on  $Cd_{1-x}Z_xX$  ( $Z = Cr, Mn; X = S, Se$ ) DMSs *Journal of Superconductivity and Novel Magnetism* (Feb. 2017).
8. Hydrostatic Pressure Effect on  $Ga_{0.75}Cr_{0.25}As$  DMS: DFT Study in *Journal of Superconductivity and Novel Magnetism* (Apr 2017)
9. Kaur K., Rani A, DFT Study of Structural, Electronic, Magnetic and Elastic Properties of GaP and  $Ga_{0.75}X_{0.25}P$  ( $X=Cr, Mn, Fe$ ), published in journal of *Applied Physics A* (2017).
10. Ab-Initio study of structural and Electronic Properties of GaP and  $Ga_{0.875}Fe_{0.125}P$  using first principal calculations, published in *International journal of Advance Research in Science and Engineering*, Vol 06, issue 10 on October 2017.
11. **Rani A.**, Kumar R “Ab-Initio study of Hydrostatic Pressure effect on the Structural Electronic and Magnetic Properties of  $Ga_{0.75}Cr_{0.25}N$  and  $Ga_{0.75}Mn_{0.25}N$ , published in journal of *Material Research Express* (Feb. 2018).
12. **Rani A.**, Kumar R , Structural stability and magnetism in  $Cd_{0.875}Mn_{0.125}Z$  ( $Z = S, Se$ ) *Applied Physics A* (2019)

### **D. Research Papers published in National/International Conference Proceedings**

1.	<b>Rani A</b> ,Kumar R., “Structural and Electronic Properties of $\text{Si}_n\text{C}_{20-n}$ ” in the proceedings of <i>American Institute of Physics</i> (ISSN 1551-7616) 2011.
2.	<b>Rani A</b> ,Kumar R “Structural and electronic properties of N doped $\text{C}_{20}$ ” in proceedings of <i>National Conference on Nano-materials (3-4, December 2012)</i> Tamilnadu.
3.	<b>Rani A</b> ,Kumar R., “Ab Initio Study Of Nitrogen-Multisubstituted Neutral and Positively Charged $\text{C}_{20}$ Fullerene (C-411)” in the Proceedings of international journal AIP ( <i>American Institute of Physics</i> ), (ISSN-1551-7616) 2013
4.	<b>Rani A</b> ,Kumar R., “Study of GaAs and GaP Semiconductor” Proceedings of international journal AIP ( <i>American Institute of Physics</i> ), (ISSN 1551-7616) (2015).
5.	<b>Rani A</b> ,Kumar R. “ $\text{Cd}_{0.9375}\text{Mn}_{0.0625}\text{S}$ Diluted Magnetic Semiconductor: A DFT Study” Proceedings of international journal AIP ( <i>American Institute of Physics</i> ), (ISSN 1551-7616)(2015)
6.	Kaur K., <b>Rani A</b> ,Kumar R., “Thermoelectric properties of Al doped $\text{Mg}_2\text{Si}$ is Published in Proceedings of international journal AIP ( <i>American Institute of Physics</i> ), (ISSN 1551-7616) (2015)
7.	<b>Rani A</b> ,Kumar R., “Effect of Hydrostatic Pressure on the Structural and Electronic Properties of $\text{Cd}_{0.75}\text{Cr}_{0.25}\text{S}$ ” Proceedings of international journal AIP ( <i>American Institute of Physics</i> ), (ISSN 1551-7616) (2015).
8.	Dhiman S., <b>Rani A</b> ,Kumar R., “DFT Study of Al doped armchair single valued carbon nanotube Proceedings of international journal AIP ( <i>American Institute of Physics</i> ), (ISSN 1551-7616) (2015).
9.	Rani A., Kumar R., DFT Study of Diluted Magnetic Semiconductor $\text{Cd}_{1-x}\text{Cr}_x\text{S}$ at $x=3.125\%$ , in proceedings of American Institute of Physics (Dec. 2016).
10.	Rani A., Pruthi N.K., Hydrostatic Pressure study of Structural, Electronic and Magnetic Properties of $\text{Ga}_{0.75}\text{Mn}_{0.25}\text{As}$ , published in proceedings of American Institute of Physics (July 2019).
11.	Pruthi N.K.,Rani A., Ab-Initio study of II-VI Diluted Magnetic Semiconductor $\text{Cd}_{0.9375}\text{Mn}_{0.0625}\text{Se}$ published in proceedings of American Institute of Physics (July 2019).
12.	Pruthi N.K., Rani A., LDA+U study of ferromagnetism in $\text{Ga}_{1-x}\text{Mn}_x\text{N}$ accepted for publication in proceedings of American Institute of Physics (Dec 2019).
13.	K. Kaur, Rani A.Study of effect of hydrostatic pressure on Structural, Electronic and Magnetic properties of $\text{In}_{0.75}\text{Cr}_{0.25}\text{P}$ accepted for publication in proceedings of American Institute of Physics (Dec 2019).
14.	Rani A., Pruthi N.K., Emergence of half-metallic ferromagnetism in $\text{Ga}_{1-x}\text{Mn}_x\text{As}$ ( $x=0.25, 0.125$ and $0.0625$ ) accepted for publication in proceedings of American Institute of Physics (Dec 2019).

#### E. Paper Presented In International/National Conferences

1.	Paper Presented under the title “Total Quality Management” in National Conference held at Baba Farid College, Deon Bathinda on 19-20, October, 2010.
2.	Paper Presented under the title “Evaluating the Development of teachers” in National Conference held at Hans Raj Memorial College of Education., 31 <sup>st</sup> October, 2010.
3.	Paper Presented under the title“Structural and Electronic Properties of Si <sub>n</sub> C <sub>20-n</sub> In International Conference on Advances in Condensed and Nano Materials (ICACNM-2011) 22-26,2, 2011. P.U.Chd.
4.	Paper Presented under the tittle “Ab Initio Study Of Nitrogen- Multisubstituted Neutral and Positively Charged C <sub>20</sub> Fullerene inSolid State DAE Symposium Thaper Uni. Patiala (Punjab), Dec-2013.
5.	Paper Presented under the title“Structural,Electronic and elastic Properties of zb-CdSe In International Conference Harnessing Engineering, technology and innovation for sustainable Development (HETIS-2014) September19-20, 2014 at Dr. S.S Bhatnagar University institute of Chemical Engineering and Technology, Panjab University Chandigarh.
6.	Paper Presented in International Conference “Condensed Matter Physics-(ICCMP-2014)”, Department of Physics, Himachal Pradesh University, Shimla ,4-6 November, 2014.
7.	Paper Presented in International Conference -“Chemical Engineering- Emerging Dimensions and Challenges Ahead- (CHEMCON-2014)”, December 27-30, 2014 at Dr. S.S Bhatnagar University Institute of Chemical Engineering and Technology, Panjab University Chandigarh.
8.	Paper presented under the tittle “Structural, electronic and magnetic properties of Cd <sub>1-x</sub> Cr <sub>x</sub> Se at x=3.125%” in International Conference “ Asian Network for Natural & Unnatural Materials-(ANNUM-3)” 28 <sup>th</sup> Feb. -2 <sup>nd</sup> March, 2015 at Department of Chemistry, Panjab University Chandigarh.
9.	Paper presented in National Conference “Advanced Material and Radiation Physics- (AMRP-2015)” 13-14, March, 2015 at Sant Longowal institute of Engineering and Technology.
10.	Paper presented under the tittle “Structural, electronic and magnetic properties of Cd <sub>1-x</sub> Cr <sub>x</sub> S at x=3.125%” in International Conference ‘RAINSET-2015’ 8-10,July,2015 at Satyabama Uni. Chennai.
11.	Paper Presented under the tittle “Effect of Hydrostatic Pressure on the Structural and Electronic Properties of Cd <sub>0.75</sub> Cr <sub>0.25</sub> S in 60 <sup>th</sup> Solid State DAE Symposium, Amity University, Noida. 21-25 Dec-2015.
12.	Paper Presented in National Seminar “NAAC Accreditation: Methodology, Process and Problems”, GNC, Muktsar on 29-03-2016.
13.	Paper presented under the tittle‘Study of Hydrostatic Pressure effect on the Structural Electronic and Magnetic Properties of Cd <sub>0.75</sub> Mn <sub>0.25</sub> S’ in International Conference held at Kerla, 3-5 june ,2016.
14.	Paper Presented under the title“ Study of Hydrostatic Pressure effect on Structural,Electronic and Magnetic Properties of Ga <sub>0.875</sub> Cr <sub>0.125</sub> N “In International Conference Harnessing Engineering technology and innovation for sustainable Development (HETIS-2014) September30-01, 2016 at Dr. S.S Bhatnagar University institute of Chemical Engineering and Technology, Panjab University Chd.
15.	Paper Presented under the title “ Study of Structural, Elastic, Electronic and Magnetic properties of Ga <sub>0.875</sub> Cr <sub>0.125</sub> P in international Conference ICNFESMH-2017, organized by NITTTR Chandigarh on21 <sup>st</sup> May, 2017.
16.	Paper Presented under the title “ Ab-initio study of Structural and Electronic properties of GaP and Ga <sub>0.875</sub> Fe <sub>0.125</sub> P using first principal calculations in International Conference on recent trends in Technology and its Impact on Economy of India held on 24 <sup>th</sup> Oct. 2017 at GNC, Muktsar.
17.	Paper Presented under the title “ Study of Hydrostatic Pressure effect on (Ga,Mn)As” , held at D.A.V. Abohar on 24 <sup>th</sup> January 2018.

18.	Paper Presented under the title “Hydrostatic Pressure study of Structural, Electronic and Magnetic Properties of Ga <sub>0.75</sub> Mn <sub>0.25</sub> As” in DAE symposium organized by Bhabha Atomic research centre, held at Guru Jambheshwar university of Science and Technology, Hisar w.e.f. 18-22 Dec.,2018.
19.	Paper Presented under the title “Research trends in characterization of Materials” in National seminar on Emerging research trends in experimental physics, held at Guru nanak College for Girls, Sri Muktsar sahib on 22-02-2019.
20.	Attended two days National Workshop on “ Nuclear Science and Applications of Radioisotopes” jointly organized by Guru Nanak College for Girls, Sri Muktsar Sahib and Indian association of Nuclear Chemists and Allied Scientist ( IANCAS),BARC, Mumbai on 9-10-March,2019
21.	Paper Presented under the title ‘Emergence of half-metallic ferromagnetism in Ga <sub>1-x</sub> Mn <sub>x</sub> As (x=0.25, 0.125 and 0.0625)’ in DAE symposium 18-22 Dec.,2019 held at IIT Jodhpur.
21.	Paper Presented under the title ‘Effect of Hydrostatic Pressure on the Structural and Electronic Properties of Cd <sub>0.875</sub> Cr <sub>0.125</sub> S’ in one day National Seminar on 01-02-2020 held at S.D. College Chandigarh
22.	Paper Presented in One day National seminar on Legal awareness on 26-02-2020 held at G.N.C. Muktsar.
<b>F. Book Published</b>	
1.	Book entitled “DFT Study of Dilute Magnetic Semiconductors” with ISBN No. <b>ISBN 978-620-2-06043-1</b> is published by international publisher <b>LAP LAMBERT Academic Publishing is a trademark of: OmniScriptum GmbH &amp; Co. KG Bahnhofstraße 28, D-66111 Saarbrücken.</b>
2.	Conference proceedings Souvenir cum Abstract book entitled “ <b>Emerging Research Trends in Experimental Physics</b> ” with ISBN No. <b>978-81-923858-4-6</b> , published by <b>Uttam Publisher, Jalandhar held on 22-02-2019.</b>
<b>G. Chapter in a Book</b>	
1.	<b>Rani A</b> , Kumar R., “Adsorption of H-atoms inside C <sub>20</sub> ” Proceedings of 54 <sup>th</sup> Solid State <i>DAE Symposium Baroda</i> (Gujrat), 2009.
2.	<b>Rani A.</b> , Kumar R., “Stability of nitrogen substituted C <sub>20</sub> fullerene: DFT calculations” proceedings of Chandigarh Science Congress, 2010.

### **F. Faculty Development Programmes/Training/GOC/ RC/Invited Talk**

1. Participated in Experimental Training Programme Organized by Radiochemistry Division (BARC, Mumbai) from 04- 08,02, 2008 on Solid State nuclear track detectors, Measurement of alpha, beta and gamma radiation using Silicon Barrier Detector, G.M. Counter, Na (Tl) and HPGe detectors.
2. Participated in Faculty Development programme on “Developing Research Skills in Faculty” w.e.f. 02-07, July, 2010 at Baba Farid College of Engineering and Technology.
3. Participated in UGC- sponsored Orientation Programme-14 ( 27-05-2013 to 22-06-2013) (28 days) at GJUS&T Hisar.
4. Participated in UGC-sponsored Refresher Course in Information Technology w.e.f. 04-24,12, 2014

(21 days) at Department of Computer Science and Applications, P.U. Chandigarh.

5. Act as a Subject Expert in State Level Workshop on Professional Development of Young College Teachers Organised by Punjab Degree College, Faridkot on January 07, 2017.
6. Delivered a Guest lecture on Research Oriented and Preparation of UGC-NET, Statistical Mechanics (Ising Model) to the students of M.Sc. (Physics)-Ist and 2<sup>nd</sup> years on 31-03-2017, at Baba Farid College Deon Bathinda.

## **Software Exposure**

- **Text Formatting and office computing:** MS Office.
- **Computing platforms: Linux:** Ubuntu, Windows.
- **Software Packages:** Siesta, Elk, Working on Wien-2K, Quantum espresso
- **Programming Languages:** Fortran, C, C++

## **Personal Details:**

**D.O.B.** : 04-01-1985

**Marital Status:** Married

**Address:** Street No. 3/3, Ranjit Avenue,  
Near Bus Stand, Sri Muktsar Sahib.



*Signature*