


Desirable Qualifications

1. **9 year of Teaching and Research Experience as an Assistant Professor in an Accredited & Centre for Excellence Institute of National repute at**  
Dept. of Physics, Patna Women's College\*, Patna University  
NAAC Re-Accredited – 'A' Grade of CGPA- 3.51 out of 4  
'College with Potential for Excellence' (CPE) status accorded by UGC  

2. **Evidence of Ph. D degree with Post-Doctoral Research experience.**  
Ph. D degree awarded in May 2008( Thesis submitted in January 2008) by Patna University and Post-Doctoral Research Project Completed in May 2009 (One year duration, Fellowship and Financial Assistance was approved by Nalanda Open University Patna)
3. **Evidence of Scholarly Research papers in Impact factor/ reviewed Journals and Proceeding and Contribution to Educational/ Curriculum development**  
Total no. of papers/ Chapter in a Book/ CPE abstracts/ M. Sc books (Total =2) published =55  
Total Citation=34 (In a 5 years)
4. **Evidence of attracting Research Grants/ Projects from UGC/ Others and Demonstrated leadership of Guidance of UG Research & Growth in higher education in basic Sciences .**
  - I. UGC-Minor Research Project on ferrite Nanomaterials(Submited by Nov.2013), Total no = 1
  - II. Basic Scientific Research Project of UGC- Guided = 7
  - III. College with Potential for Excellence status scheme of UGC-Research project Guided = 9
  - IV. Post-Doctoral research project completed = 1
5. **Evidence of Contribution to Educational /Research/ Learning through low Cost experiments, Couselling of teachers, Consulting services and participation etc.**
  - I. Engaging as **Resource person** in refreshers course/ Seminars /Conferences etc. Total no =45
  - II. No. of Conferences/ Seminars/ workshops, **Organized** =39
  - III. No. of Conferenes/ Seminars/ Symposium, Attended =35
  - IV. No. of Research papers presented in Conferences/ Seminars =13
6. **Evidence of Life membership of National and International Scientific Societies/Organizations/Academics,** Total No=07
7. **Awards and Recognitions** Total No=06
8. **Research Recognition at International level:** Research findings from thousands of credible published sources by **Chicago, USA** - High beam research( [highbeamresearch.com](http://highbeamresearch.com)), One new finding in **Nanotechnology** reported by Rakesh Kumar Singh and co-authors is getting large no of citations at International level and is being cited by peer reviewed referred journals published from large no of countries that include Poland, Romania, USA, China, Italy, etc. Recently one research paper on Ni-Zn ferrite Nanoparticles was also selected in among best 20 papers in **Evans Library of Florida Institute of Technology, Melbourne, Australia.**
9. **Broad Areas Subject at Ph.D/ Post-Doctoral level =Solid State Physics/ Physics of Nanomaterials Priority Area of Research- Magnetic Nanomaterials, Photoluminiscent Nanomaterials**
10. **Best Practices:** I. Teachnig through low cost experiment & Nanomaterials Research  
II. Bringing Scientific Values & Nuture Ethics among masses through Science & Technology Popularizaion

**#. Join as Assistant Professor at Aryabhatta Centre for Nanoscience & Nanotechnology (University Deptt.), Aryabhatta Knowledge University Patna on 2<sup>nd</sup> Sep.2013**

## Research & Development / Teaching / Exposure programme Experiences

Constant training and self-improvement is an essential component of all skill enhancement Programmes e.g love for creativity and scientific curiosity. With this aim in mind I have attended following nature programmes to improve effectiveness as facilitators of Knowledge.

S.No	Nature of Training	Duration Year	Institutions where training was provided/ Organized by
1.	Innovative Method of Teaching Physics	15-21 June 2005	IIT Kanpur
2.	<b>Master Resource Person</b> of International Year of Physics-05, <b>Proclaimed by United Nation.</b>	6-9 Aug 2005	Institute of Physics ( I.O.P) <b>Bhubaneswar</b>
3.	Innovative Method of Teaching Physics	2006	Angelika-IAPT, Patna and IIT Kanpur
4.	<b>Nobel Laureates and Science Icons of European Union</b> , Interactive Meet	8 <sup>th</sup> Feb 07	Vigyan Bhavan, <b>Delhi/ Embassy of Germany and EU delegation, DST, Govt. of India</b>
5.	Innovative Method of Teaching Physics	2007	<b>IIT Kanpur</b>
6.	Preparation of Self-Learning Materials: Methods and strategies ( <b>UG &amp;PG level</b> )	30th March 08	Nalanda Open University <b>Patna</b>
7.	<b>Master Resource Person:</b> International year of Astronomy-09, <b>Proclaimed by United Nation</b>	29 June-1 <sup>st</sup> July 2009	Guru Govind Dev Univ <b>Amritsar/ DST, Govt. of India</b>
8.	Winter School on <b>Nanotechnology</b>	24-24 Jan 2010	Nanotechnology Application Centre, University of <b>Allahabad/IIT Kanpur</b>
9-12.	<b>Senior Resource person of Utsahi Physics Teacher Meet: A group evolved through IIT Kanpur Initiative Project</b> ” for Revitalization of Physics Education in India under Guidance of Prof. H.C.Verma, Dept. of Physics, IIT Kanpur	29-31 May 2009, 4-6 June 2010, 6-9 June 2011 and 2012	St George College, <b>Agra</b> , Punjab University <b>Chandigarh</b> , <b>Science College, Patna University</b> , <b>Homi Bhabha Centre for Science Education(HBCSE), Bombay</b>
13.	<b>Research Exposure</b> for Innovative Teaching	24-26 Dec 2010	Centre for Development of Physics Education(CDPE), Univ of Rajasthan, <b>Jaipur</b>
14.	<b>Post-Doctoral Research fellow</b> in a Project – Magnetic behavior of some nanocrystalline Ferrites	March 2008-April 2009	Nalanda Open University Patna and Patna Women’s College, Patna University
15-16.	<b>Orientation programme</b> on “Motivational Skill” for Teaching	4 <sup>th</sup> Sep 06, 3-9Nov-12	Patna Women’s College, Patna University
17.	<b>Orientation programme</b> on “ The Amazing power of meditation for healing, Empowerment and Spiritual growth”	31 <sup>st</sup> Aug 05	Patna Women’s College, Patna University
18.	Participated as a One of the Expert ( <b>Resouece Person</b> ) in National workshop to “ <b>produce a module on Appreciating Physics in everyday life and Physics for Consumer</b> ”	13-15 June 2006	<b>Guwahati, / NCSTC-DST, Govt of India and DST, Govt of Assam.</b>
19-20.	<b>DST-Lockheed Martin: India Innovation Growth Programe-2011 &amp; 2012</b>	21 <sup>st</sup> Jan 2011, 24 Jan 2012	<b>Indo-Us, Science &amp; Tech Forum, IC<sup>2</sup> Institute, Univ of Texas at Austin, DST , Govt. of India</b>
21.	Training Progrmme on Research methodology	9 th Feb 2012	A.N. College, Patna, Magadh Univ, Bodh-Gaya

**Guided Research and Development Projects: UGC Sponsored under CPE and NAAC-  
'A' Grade Scheme of UGC-India**

Following Projects at UG level were conducted as a **supervisor** under **Basic Scientific Research (BSR)** of NAAC –'A' Grade and **College with Potential for Excellence(CPE)\* status** Scheme of **UGC, Govt. Of India**, at Patna Women's College, Patna University

S. No	Title of the Project	Year of Completion	Co-Guide if any	Name of the Scholar
1.	Synthesis and Study the effect of Annealing temperature on Structural & Magnetic properties of $\text{LiFe}_5\text{O}_8$ (Lithium Ferrite) Nanomaterials	2011 <b>Basic Scientific Research</b>	-	Vijeta Mishra and Rakhshan Noor
2.	Synthesis and Study of effect of size of divalent metal on structural and Magnetic Properties of $\text{MFe}_2\text{O}_4$ .	2011 <b>Basic Scientific Research</b>	-	Richa Sinha S. Kumari, Priya Tiwari
3.	Synthesis, Structural and Magnetic studies of Cu Substituted Cobalt Ferrite Nanomaterials annealed at 750°C.	2011 <b>CPE*</b>		Manisha Kumari , Divya Sharma, Trisha Raj,
4.	Low temperature synthesis of Ba-hexa ferrite Nanomaterials using Citrate Precursor Method	2010 <b>CPE*</b>	-	M.Wincet,K. D'Costa,Shanta Singh
5.	Structural and Magnetic study of Cu-substituted Cobalt ferrite Nanoparticles annealed at 650C.	2010 <b>Basic Scientific Research</b>	-	Adhishree Abha andArpana kumara
6.	Magnetic properties of Zn and Ni substituted Cobalt Ferrite Nanomaterials	2009 <b>CPE*</b>	-	Sonam Perveen and Puja Pandey
7.	,Growth , Structural and Magnetic studies of <b>Rare earth</b> element Ce substituted Zn Ferrite Nanoparticles	2009 <b>Basic Scientific Research</b>	-	Anjali Kumari, Nancy Goenka,
8.	Synthesis, structural & Magnetic studies Ni substituted cobalt Ferrite nanomaterials using Citrate Precursor Method.	2009 <b>Basic Scientific Research</b>	-	Shubhra Kumari Farheen Hayat,
9.	Synthesis, structural & Magnetic studies Rare earth elements La and Ce substituted Sn Ferrite nanomaterials.	2009 <b>Basic Scientific Research</b>	-	Pinkey singh, Sonam Perween
10	Growth and Characterization of Nanosize $\text{CaFe}_2\text{O}_4$ by Nitrate reaction	2008 <b>CPE*</b>	Prof. Giraja Gupta	M.Khemka, A Kumari,Swati Singh
11	Science and Technology of Nanomaterials: A Basic study	2007 <b>CPE*</b>	Prof. Girija Gupta	M.Srivastava, K. sweta and Ritika
12	Synthesis and Characterization of Mn-Zn ferrite nanomaterials	2006 <b>CPE*</b>	Prof. G. Gupta	A..Shivani and R. Priya
13	Preparation of Low cost electronic Intercom	2005 <b>CPE*</b>	Prof. G. Gupta	Ajita Ojha et al
14	Study of colour radiation and Photosynthesis	2004 <b>CPE*</b>	Prof. G Gupta	Sneha Singh et al.

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S.No	Title of the Project	Year of Completion	Co-Guide if any	Name of the Scholar
15.	Synthesis and effect of annealing temperature on structural and Magnetic study of Ni-Co/Cu ferrite nanoparticles	2012 <b>CPE</b>	-	Vijeta Mishra, Rakshan Noor and Priya Tiwari
16.	Synthesis and effect of annealing temperature on structural and Magnetic study of Ni-Zn ferrite nanoparticles	2012 <b>Basic Scientific Research</b>	-	Tarbia Jamil, Rashmi Kumari and Priya Kumari

**Additional:**

17. Post-Doctoral research Project(PDF): Completed in 2009

**18.UGC-Minor Research Project on Rare earth substituted Ferrite Nanoparticles: Ongoing, ref no- F.PSB/11-12(ERO)- year-2012-13**

Detail of : **College with Potential for excellence (CPE) and NAAC 'A' Grade Research projects at Patna Women's College, Patna University**

Patna women's College, Patna University is 'A' Grade institution with a cumulative Grade point average (CGPA) of 3.51 out of 4 and also College with potential for excellence status (CPE) status accorded by UGC. Under these status UGC has given special grant for inculcate scientific research temper among Science graduate students. Under **Basic Scientific Research (BSR)** and **College with potential for excellence status (CPE)** status scheme group of students ( 2 to 3 in a group) undertake research project in a specific area or topic under the supervision of a teacher in the department. The students collects data/materials, organize these and after analysis and inference, present their finding in the form of a written report under the supervision of teacher in the Dept. Subsequently they modify the content of their research and finding in the form of a research paper and a PPT presentation. A panel of judges evaluate the quality of research and the best presentations will be review by advisory committee and finally recommended their article for publishing in 'Explore' journal, [www.patnawomenscollege/explore](http://www.patnawomenscollege/explore) and [patnawomenscollege.in/IRIS](http://patnawomenscollege.in/IRIS)

**Impact Assessment of CPE and BSR projects of UGC-special scheme and Growth in higher education**

It was my observation during research work carried out by UG students under the supervision of a teacher at UG level, new properties, new Science and new applications changed the temperament of the students towards learning/ creating knowledge. I remember few of the students, who were under my supervision and worked only for receiving certificate, later changed their outlook towards scientific research and learning and now they are working in Premier institutions of national repute. Most of the scholars of UG level go in for higher studies before they opt for any Job or placement.

I have supervised total 16 UGC sponsored Research projects from Year 2004 to 2011 under CPE-UGC

## # Teaching Experience:

S. No	Title of the course taught	Post-Graduate(P.G) / Under Graduate level(UG)	No.of times taught
1.	Classical and Quantum Statistical Physics	P.G and U.G	9
2.	Physics of nanomaterials	P.G and U.G	5
3.	Magnetism and Current Electricity	U.G	9
4.	Special theory of Relativity	UG	9
5.	Central forces- Classical mechanics	UG	8

6. Mechanics, Waves & Oscillation, Electricity & Magnetism, Modern Physics, Heat & Thermodynamics and Modern Physics, Optics - of Class- 11<sup>th</sup> and 12<sup>th</sup> Level - 10 times

7. Revitalize Physics education in India through Innovative teaching methodologies. I have conducted more than 65 workshops of teachers/ students across the India as a **Senior Resource person** In IIT Kanpur Initiative Project On Innovative method of teaching Physics ' by Hon'ble Prof. H. C. Verma, IIT Kanpur

### Research Project Detail :

**1. CPE and BSR of UGC : Total =16 – Completed( Year- 2014 to 20112)**

**2. Post-Doctoral research Project: Completed in 2009**

**3.UGC-Minor research Project, Ongoing, ref no- F.PSB/11-12(ERO)- Year-2012**

**( Topic- Study of Composition and annealing temperature effect on structural , Electrical and magnetic properties of some rare earth substituted Ferrite Nanoparticles**

## Laboratory Experience ( Teaching & Research)

**1.Teaching and Research Laboratories:** I have been working in setting-up research laboratories for synthesis of Magnetic Ferrite nanomaterials using chemical methods at Department of Physics, Patna Women's College and Department of Physics, Patna University at the Patna Science College campus. We use Magnetic stirrer, Digital balance, double distilled water purifier, Oven, Muffle furnace, Mortar-Pestle for synthesis for Citrate precursor of magnetic nanomaterials. XRD, UV-Visible spectrometer, Photoconductivity apparatus and LCR meter apparatus are being used in my lab for materials characterization. For our research, we take help of Mossbauer spectroscopy (at IIT Kanpur, Key Person – Prof. H.C.Verma), Photo luminescent spectrometer ( at Nanotechnology Application Centre, Univ. Of Allahabad, Key person- Prof. Avinash C. Pandey) and Vibrating Sample magnetometer-VSM( National Physical laboratory- New Delhi, Key Person- Dr R.K. Kotnala).

In addition, I also developed low cost devices labs (+ 2, UG and PG level) at Patna Women's College under guidance of **Prof. H.C. Verma, Dept. of Physics, IIT Kanpur**. These experiments aim at conceptual understanding and observation of Physical phenomenon rather than verification of experiments described in text-book and attract attention of young minds and encourage them to ask relevant questions. Such efforts help in developing creative thinking and make Physics learning interesting.



I have prepared 25 motivational PPT lecture ( **UG and PG level**) on Golden decade of Modern Physics, Relevance and Contributions of Eminent Physicist, Appreciating Physics in daily life and Inspire Physics Education and Research as a Carrier for sustainable development of society. These lectures are very encouraging to P.G and U.G Physics student and faculty members which I used to groom the young minds for shaping the society.

**2. Conducting laboratory courses:** I am conducting **teaching** labs of UG and PG level that contains (1).Determination of acceleration due to gravity by Katers pendulum (2) determination of Mechanical equivalent of heat (J) by Joule's Calorimeter method (3) Determination of modulus of rigidity of the materials of the given wire by Warton's apparatus (4) Determination of the Elastic constants of the materials of the wire by Searl's method. (5) Determination of modulus of rigidity of the materials of the given wire by Dynamical method (6) determination of the frequency of an electrically maintained tuning fork by Melde's apparatus. (7) Verification of transverse vibration of string by Sonometer (8) Determination of the surface tension of water by rise in capillarity tube method. (9). Determination of the Young's modulus of the materials of the bar by method of bending. 10-15. Electronics & Optics Lab and More. On the other hand I have conducted **more than 65 workshops as a resource person** for Higher secondary School teachers & students / Research scholars on learning Basic Physics through low cost/ No cost experiments. These types of shows enhance the natural process of learning along with teaching-writing (teaching-writing and learning basic principle of Physics).

### **3. Using different type of Instruments:**

1. X-ray diffractometer (XRD),
2. Vibrating sample magnetometers(VSM)
3. Photoluminescent spectrometer (PL)
4. LCR meter
5. U-V visible spectrometer

**Computational:** IBM Personal computers (Laptop and desktop) **Software:** Windows based software: X'Pert plus, Origin, PDXL software, MS office, Linux based Openoffice, etc.

### **Life Membership / Linkage of Learned Societies**

#### **1. Society for Scientific values, Delhi-Coordinated by Padam Sri, Prof. K.L.Chopra, Ex-Director, IIT Kharagpure**

Objective: To promote objectivity, Integrity and Ethical values in all pursuits of Scientific research, Education and management

#### **2. Science for Society Bihar, Member-NCSTC network, New Delhi.**

Coordinated by Prof. S.P.Verma, Ex-University Prof. &Head, Deptt. Of Physics, Science College, Patna University State level organization for producing Science & Technology Communication

#### **3. The Art of Living foundation, India-Founder- H.H Sri Sri ravishankar**

Spiritual organization of international level for Peace, Harmony, foster ethical values and spiritual growth

#### **4. Magnetic Society of India (MSI), Hyderabad**

National organization to promote , encourage & Develop the growth of Magnetic materials, Components and Devices.

#### **5. Utsahi Physics Teacher Group- of Prof. H. C.Verma, I.I.T Kanpur**

A group of teachers of India that advocates for experiment-assisted Physics teaching and trained by Prof. H.C.Verma, Dept. of Physics, IIT Kanpur( [www.utsahiphysicsteachers.com](http://www.utsahiphysicsteachers.com))

#### **6. Indian Association of Physics Teachers and Anvesika,**

National level organization of Scientists, Teacher, Technocrats for Physics Education and its development

#### **7.Indian Science Congress**

## #. Awards/ Recognitions/ Honours/ Distinctions

1. Recognition of **Senior Resource Person** of Utsahi Physics Teachers, Coordinated by By Prof. H. C. Verma, Dept. of Physics, IIT Kanpur, [www.physicsteachers.com](http://www.physicsteachers.com) in 2009.

2. Selected by **DST, Govt of India**, in an **International Interactive meet of Noble Laureates and Science Icons of Germany, Europe and India**, on the topic **“Motivation of Youth in Science and technology” On the Occasion of India- European Union Ministerial level Science Conference, Organized by:- DST, Govt of India, Host:- Deptt. of Science and Technology**, Embassy of Germany in New Delhi, European Union(EU) delegation of EC in India. **Time-1000-1730hrs; Date- 8<sup>th</sup> Feb 2007; Venue- Vigyan Bhavan, New Delhi.**

**Basis of selection:- interest in Research- Teaching and Scientific activities.**

3. **The Master Resource Person (MRP) of International Year of Physics(IYP)-2005 Proclaimed by United Nation.** The training programme was held at Institute of Physics **Bhubaneswar** and Organized by **DST, Govt. Of India**. I was nominated as a The Master Resource Person (MRP) by BCST-DST, Govt. of Bihar and Science for Society- NCSTC network, Delhi

4. **The Master Resource Person(MRP) of International Year of Astronomy(IYA)-2009**, proclaimed by **United Nations of its 62 general assembly**. **Training programe was held at Gurunanak Dev University Amritsar**, and Organized by **DST, Govt. Of India**. I was nominated as a The Master Resource Person (MRP) by BCST-DST, Govt. of Bihar and Science for Society- NCSTC network, Delhi.

5. **Young Scientist award:** In 1<sup>st</sup> Global Bihar Science Conference (7- 9 May 2008, held at Patna Science College, Patna University) by Screening committee of Global Scientific council of B.Brain Devlopment Society, An International forum of Scientists, Academicians, Technocrats, Industrialists of Bihar origin. Prof. J.Thakur, Ex-Vice Chancellor, Patna University, Prof. Dolly Sinha, Principal, Magadh Mahila College Patna and Bibhuti Bikramaditya were the Chairmain, Convener and Secretary respectively of this International Conference.

6. **One of the Expert in National workshop to “produce a module on Appreciating Physics in everyday life and Physics for Consumer” at Guwahati, Date –13-15 June 2006, Organized by- NCSTC-DST Govt of India and DST, Govt of Assam.**

7. Appointed as a Coordinator in a programme – **“Vigyan ke teen sopan” Khoj, Sodh Aur Bodh, Indo-German Initiative**, A Countrywide Programme on Research and Devlpment popularization built around an exhibition train – **Science express** ( A journey in to the future of Scientific discovery) at Patna. This Science express train was developed by **German Plank Society, Govt. of Germany** and DST, Govt. of India., Organized by :- NCSTC-DST, Govt. of India, Science For Society Bihar. Date:-26-29 December 2007. The main purpose of this train is to create awareness about Science education & Research among general public and academiciains/ students. On this occasion I have visited various higher education institutes( one month compaigning) in Patna for visiting this Science Express train and organized career orientation session in R&D, and Guest lecture on cutting edge research at Patna Railway station for 3 days. **Nearly more than 1 lakh people visited this Science express train**

8. Research Committee (**Managing Editor**) member of the **Journal (1). IRIS: Journal for Young Scientists**, ISSN. 2278-6384(Online); ISSN.2278-618X(Print). Web-[patnawomenscollege.in/Journal-IRIS](http://patnawomenscollege.in/Journal-IRIS) (2). **Explore: Journal of Research for Undergraduate and Post-Graduate students**, ISSN. 2278-6414(Online);ISSN. 2278-0297(Print); Web-[patnawomenscollege.in/Journal-Exploe](http://patnawomenscollege.in/Journal-Exploe)

## Demonstration method of Lecture: Innovative Method of Teaching Physics

### Senior Resourse Persons of Utsahi Physics Teachers

(A group evolved through IIT Kanpur Initiated Project on Innovative Physics Teaching)

Coordinated by Prof. H.C.Verma, IIT Kanpur, [www.utsahiphysicsteachers.com](http://www.utsahiphysicsteachers.com)

For Revitalization of Physics Education through Innovative Teaching Methods

#### \*Senior Resourse Persons of Utsahi Physics Teachers Group

Prof.. H.C.Verma, Dept. Of Physics, IIT Kanpur, Prof. M.S. Marwaha, Punjab University Chandigarh, Dr. R.K. Awasthi, St. George College Agra , Dr. Amit Jana, Kolkata, Dr. R.K. Mitra, Mt. Carmel College Lucknow, Dr. Sateesh Yadav, Hardoi, Shri Amit Bajpai, IIT Kanpur, **Dr. Rakesh Kumar Singh, Patna Women's College**, Shri Brajesh Dixit, Orraiya, Dr. Ajay Mahajan, Latur, Dr Laxmikant Sharma, Pilibhit, Dr. Amarendra Narayan, Patna University, Ms Smita Fangaria, Noida, Dr. Brajesh Pandey, IIT Kanpur.

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\_Nature is beautiful and understanding it, from quarks and leptons to Galaxies, is even more beautiful. Learning Physics and sharing it with students and fellow colleagues is an exciting experience and also a great challenge. Through workshops on Physics experiments, Science shows, Teacher's training Camps and numerous other activities, Utashi Physics Teachers are spreading the fragrance of Physics learning thrill among students and teachers from middle school to Postgraduate level. **This group has been coordinated by Professor H. C. Verma, Dept. of Physics, IIT Kanpur.** He is Professor of Physics at IIT Kanpur and is constantly interacting with Physics teachers at school and college levels towards making Physics Teaching interesting and more meaningful. From these interactions, this group of highly motivated teachers has evolved which we call “**Utsahi Physics Teachers.**”

#### Senior Resource Persons (SRP)

These are Physics teachers who have attended several NWUPTs( National workshops of utsahi Physics teachers) and are very active in training other teachers in Physics Teaching Workshops in their regions. These persons are highly committed towards education and spend significant amount of time in conducting workshops, contacting teachers, generating funds and so on. This is in addition to their regular institutional duties.



*Prof. H.C. Verma, Dept. Of Physics, IIT Kanpur delivering lecture on Revitization of Physics Education in India & Low cost demonstration Experiments by Dr. R.K.singh and Dr. A.narayan, SRP'S of Utsahi Physicst teachers*

There are altogether **15 SRP'S\*** . In each year there is SRP'S meet and Research exposure camp is being organized for upgradation for teaching- research, across different part of the country i.e It was held at IIT Kanpur, Univ. of Allahabad, Univ. of Rajsthan, Jaipur, BIT's Pileri, HBCSE- Bombay, Science College, Patna univ, that is dedicated to Science Education in general and Physics Education in particular within India. **Such meet is a part of nationwide effort to renew the interest of students/ teachers in science through innovative methods.**



Science Teaching at present begins at quite early stage in school education and each important concept is visited several times during the period the student is going through his/her education. In spite of this, it is found that the understanding of science among the average students is very poor. Most of the learning that the students are doing can be termed at best as rote learning or learning without proper conceptualization. The ground reality is that most students go through the motion of education without any practical hands-on experience connected with whatever they have studied in their books. They have not been taught that science is intimately related to their life. Such students will be lacking in their ability to apply their knowledge in real life situations because they have not internalized whatever they have learnt. This situation is appalling. Students go through the motions of science education without grasping the meanings. During the whole process of education, the students hear, watch, read, absorb and in most cases accept everything unconditionally. On the other hand, true science education should involve *observing, questioning, critically examining, correlating, getting challenging ideas* and *experimentally verifying* them as far as practicable. The proposed session aims to train teachers/students in teaching-learning methods involving use of simple low-cost experiments for stimulating the interest of students and getting them into the mode of active enquiry conducive for concept learning.

There has been a general deterioration in the level of understanding of science in India although many research institutions have been established natio-wide. This can be attributed to a lack of scientific culture. I present here a very effective method that creates interest in science, especially Physics with help of Low-cost / no cost experiments. These experiments take five to ten minutes to perform and have great pedagogical value. We have demonstrated these experiments under various situations including regular classrooms/ special lecture session. We have found that when combined with right type of questions, they are very effective tools for concept-building and interest generation in Basic Science and Scientific Research. **Examples**

**Demonstration of Electromagnetic damping:** Electromagnetic damping is the slowing down of a moving magnet near a conductor due to induced currents. This can be demonstrated by using a strong magnet and an Al-tube. The Al-tube is kept vertical. When a strong magnet is released inside the tube from the top, it is observed that the magnet takes considerable more time to fall through the tube compared to what a non-magnetic body will take to fall through the same tube. This slowing down is due to the eddy currents produced in the Al-tube due to electromagnetic induction when subjected to moving magnetic field. This magnet in turn experiences a force that opposes the relative motion.

I Conducted class with the help of these type of many low cost/ No cost experiments and have attracted attention of students and encouraged them to ask relevant questions in basic science. Such efforts help in demystifying Science, developing Scientific thinking in students and create Physics learning interesting.

### **Low Cost Optical Bench:**

We have made several Low cost optical Benches and its different components using which a number of optics experiments can be carried out. It consists of an Aluminium rail about 1.0 m long over which different elements such as concave or convex lenses, variable width slit, double slits, concave mirrors, screen, candle stand or electric bulb, etc. can be placed according to the requirement of the experiment. We have tried several different experiments with this optical bench. It is also very handy for classroom optics demonstrations.

## Publications : International/ National Journal/ Proceeding etc.

### Papers of Scientific Research on Nanomaterials:

- 1. Rakesh Kumar Singh**, B.C. Rai, Kamal Prasad, Synthesis and Characterization of Cu substituted Cobalt ferrite nanoparticles, **International Journal of Advanced Materials Science**, Vol. 3, No.2 (2012), pp. 71-76
2. S. Bhagat, K. Amar Nath, K.P. Chandra, **R.K. Singh**, A.R. Kulkarni, K. Prasad, The structural, electrical and magnetic properties of perovskite  $(1-x)\text{BaFe}_{1/2}\text{Nb}_{1/2}\text{O}_3-x\text{BaTiO}_3$  ceramics, **J. Advanced Materials Letters**, DOI- 10.5185/amlett.2013.fdm.28(2013)
- 3. Rakesh Kr Singh**, K. Prasad, D.P. Singh, R.N. Roy, R.S. Yadav, A.C. Pandey, On the magnetic and photoluminescence properties of Calcium diferrite ( $\text{CaFe}_4\text{O}_7$ ) nanoparticles, **International Journal of Material Science and Electronics Research**, Vol.3 No.1 (2012)p.1-7.
4. M. Abdullah Dara, Vivek Verma, S.P. Gairola, W.A. Siddiqui, **Rakesh Kumar Singh**, R.K. Kotnala, Low dielectric loss of Mg doped Ni-Cu-Zn nano-ferrites for power applications, **Applied Surface Science**, Elsevier, Volume 258, Issue 14, (2012), P. 5342-5347
5. **R. K. Singh**, A. Narayan, K. Prasad, R. S. Yadav, A. C. Pandey, A. K. Singh, L. Verma, R. K. Verma, Thermal, structural, magnetic and **photoluminescence** studies on cobalt ferrite nanoparticles obtained by citrate precursor method, **JTAC-Springer**, (2012) DOI 10.1007/s10973-012-2728-1
6. M. K. Mishra, R.S. Yadav, **R.K. Singh**, A. Narayan, A.C. Pandey, Effect of Mercuric Oxide doping on optical properties and strain in Zinc Oxide nanoparticles, **Proceeding, Lucknow Journal of Science**, Vol. No. (2011) p.84-88.
7. Nanophosphour : A Luminiscent Materials, A.C. Pandey, **Rakesh Kumar Singh**, **Proceeding, Nanoscience & Nanotechnology, Patna Women's College**, (2008)p.5-11
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#### [Research Papers in](#)

#### **Explore- Journal of Research for Undergraduate and Postgraduate students**

Under the College with Potential for Excellence(CPE) status by UGC, Govt. of India, Scheme, embodies the research work of my students as a co-authors.

**[ISSN 2278-0297\(Print\), ISSN 2278-6414\(online\), <http://patnawomenscollege.in/journal>](#)**

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*Research Papers in*

*IRIS - Journal for Young Scientists.*

Under the Basic Scientific Scheme(BSR) special Scheme of UGC, Govt. of India embodies the research work of my students as a co-authors.

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### **Papers on Innovative teaching, Science Education & Popularization**

41 .Santosh Kumar, **Rakesh Kumar Singh**, B.C.Rai, Amarendra Narayan, Popularization of Physics through Low cost/ No cost Experiment, Manthan, International Journal, Vo1.8(2008),p.31-32,

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46 .**Nanotechnology**, General and Environmental studies (GES) manual, Patna Women's College, Patna University, Vol. 1 (2008), p.235-239.

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### **Books Written :**

48. Statistical Physics, **M.Sc course**, Part 1, Nalanda Open University, Patna, September - 2008, pp. 1-148.

49. **Physics for Nanomaterials**, **M.Sc course**, Part 2, Nalanda Open University, Patna, December-2008, pp.1-264.

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**.# Detail of Book Published : Physics of Nanomaterials, M.Sc course, Part 2, Published by Nalanda Open University, Patna ,1<sup>st</sup> Ed. 2009, pp. 1-264, Paper -11**

**Contents:** Unit 0- Nano-Science: An Overview

Unit1- Free Electron theory

Unit2- Band Structure

Unit 4- Quantum Size effect

Unit5- Quantum dots

Unit 6- Quantum wire

Unit 7- Characterization tools for Nanomaterials

Unit 8- Photoluminiscent and Raman effect

Unit 9- Methods of preparation of Nanomaterials

Unit 10- Technological Applications

**Detail of Book Published : Statistical Physics, M. Sc course, Part 1, Published by, Nalanda Open University, Patna ,1<sup>st</sup> Ed. 2009, pp. 1-148, Paper -4**

**Contents:** Unit 1- Statistical Physics: Introduction

Unit 2-Phase space : Ensemble

Unit3- Density matrix

Unit 4- Ising model , Unit5- Phase transition

**#. Books chapters written:**

I. **Nanotechnology**, GES manual,p. 235-239 Patna Women's College, Patna University.

II.**Different form of Radiation**, GES manual,p.196-198,Patna Women's College, Patna University.

54. Thermal, Structural, Magnetic and Photoluminescence properties of Cobalt ferrite nanoparticles, JTAC-Springer, Vol.110, No.1, DOI 10.1007/s10973-012-2728-1

55. Thermal , Structural and Magnetic study of Sm-Fe Garnet nanopowder, accepted, Springer-JTAC(20013)

I have studied several aspects of the magnetic behavior as well as structural characteristics of nanocrystalline ferrite materials including zinc ferrite, barium ferrite, Strontium Ferrite and Nickel-Zinc mixed ferrites . I have synthesized  $ZnFe_2O_4$ ,  $Ni_xZn_{1-x}Fe_2O_4$  spinel nanomaterials and  $BaFe_{12}O_{19}$ ,  $SrFe_{12}O_{19}$  hexaferrite nanomaterials using citrate precursor method. In this method, generally, nitrates of all the cations (the divalent metal(s) and the trivalent Fe) are taken in stoichiometric proportion as starting materials. Aqueous solutions are prepared separately and mixed together along with suitable amount of citric acid. The mixture is heated in an oven and then dried so that it forms a brown color citrate precursor. This precursor is annealed in a muffle furnace at specific temperatures at which it gets thermally decomposed to give ferrite nanoparticles of different size. This ferrite powder is characterized for structure determination using XRD, for magnetic behavior using VSM and for ionic distribution and superparamagnetic fluctuations using Mossbauer spectroscopy.

In my work, I prepared Zinc ferrite in which the precursor was annealed at 450°C and 650°C and Nickel Zinc ferrite ( $Ni_{1-x}Zn_xFe_2O_4$ ;  $x = 0.2, 0.4, 0.5, 0.6$  and  $0.8$ ) annealed at temperature 450°C only. In the case of Zn ferrite we obtained pure phase (as per ICDD data). The magnetic properties measured using VSM were observed as particle-size dependent. We also observed a slight decrease in particle size on store the ferrite samples about an year at room temperature. The five samples of Ni-Zn ferrite containing Ni in different proportions, were annealed at same temperature showed different particle size. The magnetic properties as well as particle size were observed to depend on relative proportion of Ni and Zn. The maximum saturation magnetization was found to be 52.18 emu/g. The lattice parameter has a tendency to decrease with increase in the proportion of Ni but I did not get a linear relation as had been reported for the case of bulk ferrite. The Mossbauer spectrum shows that Fe ions occupies both the A and B sites in the sample and superparamagnetic fluctuations are not significant. **However, the  $B_{hf}$  values of the sextets in the spectrum (47.6 T and 43.5 T) are less than the values expected for bulk samples (50T to 55 T) indicating the fact that the particles are in nanosize but the blocking temperature is above room temperature.** The XRD peak broadening for this particular sample gives the average particle size to be 18 nm consistent with the reduced  $B_{hf}$ . We have also synthesized some hard ferrite samples (hexaferrites) We prepared pure phase and mixed phase strontium ferrite (annealed at 450°C). We observed a change in retentivity that seemed independent of magnetization. This behavior suggests non-stoichiometric preparation as a possible route for engineering samples for a particular set of magnetic parameters values. An annealing temperature 600°C was used to obtain Barium hexaferrite nanoparticles. At this annealing temperature we prepared hard ferrite sample that has a relatively high coercivity of 196.02 Oe as well as small particle size (32 nm). The sextet in its Mossbauer spectrum with line width of 0.2816 suggests that the sample is in single phase and the relative line intensity (3:2:1:1:2:3) suggests that the magnetic particles are randomly oriented. Many different processes have been used by various groups for preparing Barium hexaferrite. In all these a high annealing temperature is required. The samples prepared using citrate precursor method by us gave good results at relatively low annealing temperature. We observed 32nm particle size of Barium hexaferrite in sample annealed at 600°C temperature.

In continuation of my Doctoral work I have also studied Photoluminescence in soft and hard ferrite particles. I have prepared rare earth elements (La, Ce and Sm) substituted soft and hard ferrite nanomaterials and studied their structural and magnetic properties. We observed that large ionic radius rare earth ions creates stress in crystal and additional phases emerge as magnetic properties undergo drastic change. My other post-Ph.D. works include Thermal-kinetic, Structural and Magnetic studies of Chromites and Alumunates.

## **Detail : Training Programmes for work efficiency and creating interest in Science Education and Research.**

The work efficiency of teaching-learning and quality improvement is developed through orientation programmes. I have attended 16 such orientation programmes at Patna Women's College and outside too, e.g. Institute of Physics Bhubaneswar, IIT Kanpur, G.D. University, Amritsar, Patna, Guwahati, Delhi, Jaipur, Allahabad, Chandigarh and Agra etc. A brief description is given below.

#. I worked as a **Post-Doctoral Research Fellow** in Project titled "Study of magnetic behaviour of Some Nanocrystalline ferrite" funded by Nalanda Open University( **NOU** ), Patna. This project was sanctioned for a period of one year ( 14<sup>th</sup> March 2008 to 30<sup>th</sup> April 2009) by Nalanda Open University Patna( This University named on **ancient Nalanda University** and established by act of Parliament/ State legislative council) under Prof. Asheshwar Yadav, Principal investigator- cum chief co-ordinator, School of pure Sciences, P.G Section, **NOU ( Former Vice Chancellor, B.R.B.U, Muzaffarpur, Prof. Of Physics, Patna Univ, Science College and presently Director, V.V. Ins. Of Technology, Purnea).**

#. **Master Resource Person training programme of International Year of Physics(IYP) , International Year of Astronomy(IYA), Proclaimed by UNESCO and Producing a module for Science teachers: How appreciating Physics in daily life**

Year 2005 was declared as **International Year of Physics(IYP) by united nations**. This year marks of the theory of relativity: Special and general- has stood the test of time for a century now and remains one of the greatest creation of human mind that help us to understand nature in the proper perspective. The **IYP** also marks the centenary of the golden decade( 1895-1905: Modern Physics) in which momentous discoveries in Physics were made. In the same year Albert Einstein's seminal paper entitled " on the electrodynamics of moving bodies" appeared in Annalen der Physik in 1905. Importance to celebrating the year of Physics is, so celebrating celebrating 100 year of the golden decade and offers great opportunity to communicate the basic Scientific aspects of these discoveries and how they have shaped our lives, promotes the method of science and spread a scientific outlook among the people. Similarly **Year:2009** was declared as **International Year of Astronomy(IYA) by united nations**. In this year we celebrate a momentous event, the Astronomical use of a telescope by Galileo in 1609, an invention that initiated 400 years of incredible Astronomical discoveries; and pay homage to one of the greatest of scientists. Indeed, Galileo telescope triggered a scientific revolution, which has profoundly affected our world view. At the same time, we celebrate yet another momentous event- the publication of the first two laws on planetary motion by Johannes Keplers in 1609 . **the Total Solar Eclipse, the largest celestial drama of this century** was occurred on **22 July 2009** ,in the same year

I have been nominated as a **Master Resource Person of International Year of Physics(IYP) and International Year of Astronomy(IYA)** by BCST-DST, Govt. of Bihar and Science for Society, Bihar, Member, NCSTC-New delhi and spread the aim and objective message in a Colleges/ Institutes of state Bihar on following things to keep in mind

"To assimilate, all human beings realize the impact of Basic Science & Research and Astronomy, Relevance and contribution of Einstein, Modern Physicist, Galileo, Aryabhata, Keplers and quantum world on our daily lives and understand better how scientific knowledge can contribute to a more equitable and peaceful society through Lecture, workshops, and Scientific activities"

# As a Senior Resource Persons(SRP)of Prof. H.C.Verma IIT Kanpur one **Research Exposure** and one **SRP workshop** in a year on experiment based teaching methodology was organized in different parts of country. I used to participate and help to organize these session from Year.2008 to 2010. at St. George College Agra, Nanotechnology Application centre, Univ of Allahabad Panjab Univ Chandigarh, Centre for Development of Physics Education, Univ of Rajsthan, Jaipur respectively. The third SRP's Meet was going to be held at Science College, Patna University in 4-6 June 2011 in which I going to conduct this workshop as a **Co-Convener**.

### **#. Developing module to Communicate Physics in Daily Life and Physics for consumer**

Everyday, we see around us various phenomenon- at home or outside- that can be explained only by Physics. Once the laws of Physics are understand it becomes very much simple to explain all the observed phenomenon. An understanding of Physics is very much essential for smooth running of our life. We may not have studied Physics hat subject in the classroom but there is need for everyone to understand it, at least the basic laws of Physics that govern our daily life. As a consumer, producers and sellers of commodities also see around us and face various phenomenon t hat can be explained by Physics-leading to informrd production, sale, purchase, use and disposal of products. For example-

- Why do fluorescent tubes consume less power
- Why do we always use a cotton towel after bath to dry out body and never a towel made of nylon or polyster. Etc.

**I have participated in a National Workshop on this topic as a Resource person(Expert), at Guwahati in June 2007, invited by NCSTC-DST, Govt. of India**

### **DST-Locked Martin India Innovation growth programme 2011 and 2012**

This programme was held at Patna on 19<sup>th</sup> Jan 2011 and 21<sup>st</sup> Jan 2012 and its aims to synergise the world of Science and the world of Business by assisting the indian innovators in accelerating their technologies in to global Markets and is to assess the right scientific and the commercial value of your innovation and help you take it the \global market. This Session was organized by: IUSSTF, **Indo-US, Science & Tech Forum**, IC<sup>2</sup> Institute, **Univ of Texas at Austin, DST** ,Govt. of India

### **#. Interactive Meet with Nobel Laureates And European & Indian Science Icons**

**( Host: DST, Embassy of Germany in New Delhi, EU Delagation of EC in India)**

Ministry of Science and Technology is devising new measures and initiatives to attract young and bright talents to take up Science education and Research as a career. It is augmenting opportunities for cross border learning to augment innovative scientific research. With a view to deepen interest of Indian youth, a series of programmes are planned. First such interaction is being planned during **India-European Union Ministerial conference on Science** at New Delhi, Feb 07-08, 2007. On this occasion, Nobel Laureates winners and Personalities of Eminence in Science from Europe together with Indian Science icons are being invited for an interactive session with bright, promosing and young Indian Ph.D scholar enrolled in Science & Tech field. A statement of questions being investigated under the Ph.D programme and one page



account of your science career goals and aspiration would be of significance in choosing up 500 Indian Ph. D scholars by DST, Govt. of India for the said interactive meet.

I was selected from Bihar to this meet and very energetic and enthusiastic session with :

1. H.E. Dr. APJ Abdul Kalam, President of India
2. H.E. Prof. C.N. Rao, President of Jawaharlal Nehru Centre for Advanced Scientific research Bangalore
3. H.E. Sri kapil Sibbal, Minister of Earth Science and technology, Govt. of India
4. H.E. Dr. Annette Schavan, German Federal Minister for Education and Research
5. H.E. Dr. Janez Potocnik, European commissioner for Science and Research
6. Prof. paul crutzen, Max planck Institute for Chemistry, mainz, Nobel Prize winner in 1995
7. Prof. Bert Sakmann, Maxplanck Institute, Heidelberg, Nobel Prize Winner in 1991 and few others.....

### **Collaboration / Linkage with academicians/ Mentors**

1. Prof. H. C.Verma, Dept. of Physics, IIT Kanpur
2. Dr. Amarendra Narayan, Dept. of Physics, Patna Univ, Science College
3. Prof. K.L.Chopra, President Society for Scientific Values, Delhi( Ex-Director, IIT Kharagpur)
4. Prof. S.N.Guha, Vice Chancellor, Aryabhata University Patna
5. Dr. Chandan Upadhyay, Institute of Technology, BHU
6. Dr. R.K.Kotnala, Head, Magnetic Std. Lab, National Physical Laboratory(NPL) New Delhi
7. Bibhuti Bikramaditya, Global Chairman, Bbrain Dev. Society
8. Prof. S. P. Verma, President, Science for Society, Bihar, former chairman: NCSTC-New Delhi and Univ. Prof. And Head, Physics Dept. Science College, Patna University.
- 9 .Prof. Avinash C. Pandey, Nanotechnology Application Centre, Univ. of Allahabad

**Important Conferences/ Seminars/ Symposiums/ Scientific Session Organized**

	<b>Name of the Events</b>	<b>Responsible for</b>	<b>Date</b>	<b>Venue</b>
1	National Workshop on Collaborative Research in Basic & Applied Science, sponsored by UGC-DAE-CSR-Kolkata	Convener	9-10JAN-2013	Patna Women's College
2.	Interactive Session with Prof. Yash Pal on " Growth and Trends in Science Education."Org. By- Dept. of Physics, PWC	Co-ordinator		Patna Women's College
3.	UGC-Sponsored National Symposium on ' Emerging Trends in Materials Science'	Jt.Organizing Secretary		Patna Women's College
4.	<b>UGC sponsored National Conference on 'Role of Science and Tech for Developing society'</b>	Organizing Committee member		A.M. College Patna,
5	<b>UGC Inflibnet workshop</b> for Research and Development	Organizing Committee member	18 <sup>th</sup> March 2011	Patna Women's College
6.	Senior Resource Person of Utsahi Physics Teachers Meet-2011: A group co-ordinated by Prof. H.C.Verma, Dept. of Physics, IIT Kanpur	Co-Convener	4-6 June 2011	Science Collge Patna University
7.	4 <sup>th</sup> Global Bihar Science Conference, Year-2011 Organized by- BBrain Development Society, Date-	Organizing Committee member	11-13 Feb 2011	L.S.College Muzaffarpur, B.R.B.Bihar university
8.	National Conference on Human Rights and Role of Non-state actors" organized by Dept. of Political Science, PWC	Organizing Committee member		
9.	Motivational Talk on " <b>Indian Science : Yesterdat, Today and Tomorrow</b> " by Prof. H.C. Verma, Dept. of Physics, IIT Kanpur	<b>Co-ordinator</b>	<b>5<sup>th</sup> Dec 2011</b>	Patna Women'sCollege
10.	International Conference on Science Education & Research ( 4 <sup>th</sup> Global Bihar Science Conf- 2010) Org. By- BBrain Dev. Soc.& Gaya College, Magadh University Bodh-Gaya	Organizing Committee member	<b>2010</b>	Gaya College Magadh Univ. Bodh-Gaya
11.	3 <sup>rd</sup> Bihar Vigyan Congress, org. by- BCST, DST, Govt, Of Bihar,	Steering Committee member	2-5April 2010.	DST-Govt. of Bihar
12.	National Symposium on Contributions and Relavance On S. Chandra Shekhar and Dorothy	National Advisory Member	19 Nov 2010	J.D.college, J.P.University
13.	<b>National Seminar on "Ethics in Science &amp; Technology"</b> , Organized by Science Depts. Of Patna Women's College, Patna University and <b>Society for Scientific values Delhi.</b>	Organizing Secretary	22 Aug-2009	Patna Women'sCollege

## Important Conferences/ Seminars/ Symposiums/ Scientific Session Organized

S. No	Name of the Events	Responsible for	Date	Venue
14.	State level awareness on Total Solar Eclipse- 22 July 2009, Largest celestial drama of 21 <sup>st</sup> Century, International Year of Astronomy-2009, supported by- Vigyan Prasar, Govt. of India, SCERT Patna, Science for Society Bihar, S.K. Science Centre Patna.	<b>Programme Co-ordinator</b>	20-22 July 2009	<b>S.K.Science Centre Patna</b>
15.	<b>Seminar on ‘ The Universe through day and Night sky observations: Citizens’ Perspective’</b> on the aigies of International Year of Astronomy-2009, Proclaimed by united nation,	<b>Co-ordinator</b>	18 <sup>th</sup> Dec 2009.	Patna Women’s College, ate
16.	National Sympoium on “ <b>Climate Change and sustainable development</b> ”, Organized by: Magadh Mahila College Patna, Patna Univ,	Organizing Committee member	<b>23-24 Dec 2009</b>	Magadh Mahila College Patna, Patna Univ,
17.	International Conference on Science Education & Research ( 4 <sup>th</sup> Global Bihar Science Conf- 2009) Org. By- BBrain Dev. Soc.& Commerce College, Magadh University Bodh-Gaya	Organizing Committee member	<b>2009</b>	<b>College of Commerce Patna</b>
18.	Sweden- India Scientist Interection meet on Nanomedicine	Organizing Committee member	17 th Jan 2008	Patna Medical College
19.	National Symposium on “ <b>Lelavance an Contributionsof H.J.Bhabha, J.C.Boss and Charles Darwin on his birth centenary</b> ” ,	Organizing Committee member	30 <sup>th</sup> Oct 2009	J.D.College Chapra, j.P.Univ,
20.	felicitation programme and deliver a Global chairman message- of Prof. Lee Hoon taek and his five member team, a well known Scientist and director of organresearch centre, Konkuk University, Seol, South Korea for making him member of Global scientific Council of Bihar Brain.	Organizing Committee member	21 Dec 08,	<b>Patna</b>
21	UGC sponsored National Conference on “ <b>Nanoscienceand Nanotechnology for the development of Bihar</b> ”. Organized by B.S. College Danapur, Patn	<b>Steering Committee</b>	18-20 April 2008.	<b>B.S.College Danapur</b>
22.	UGC Sponsored National Seminar on “ Applications of Nanoscience and Nanotechnology	<b>Jt.Organizing Secretary</b>	<b>12<sup>th</sup> Sep 08</b>	<b>PWC</b>
22.	Inter University essey contest on “Indo-U.S nuclear deal is in India’s interest”	<b>Coordinator</b>	<b>22 Sep 2009</b>	<b>PWC</b>
23.	ic Scientific foresight-2008, Global Symposim ocontemporary Science and Technology Organized by- Dept. of Scienceand Technology, Govt. of Bihar	Organizing Committee member	19-21, December 2008,	S.K.Memorial Hall Patna

24.	six day state level Physics Learning Camp for B.Sc student (Physics Hons) at Patna Science College, Organized by- NCSTC- DST, Govt of India and Science for Society Bihar,	as a Co-ordinator	4-10 <sup>th</sup> Nov 2006.	Science College Patna University
25.	national level Essey on “ Use of mobile phone – A revolution in communication”,	Coordinator	13 <sup>th</sup> Jan- 2005.	PWC
26.	<b>National Graduate Physics Examination (NGPE)</b> of Indian Association of Physics Teacher (IAPT), Regional Council Bihar and Jharkhand .	assistant Coordinator	2006-07	Patna
27.	the National level Essey competition member on “ <b>Milestone in the development of modern Physics</b> ”, Date-	CO-ordinator	19 <sup>th</sup> Sep 2005.	PWC
28.	Film show on “ <b>Einstein- Magical Year</b> ”, A contest on “ <b>Verdict on Pluto-not a planet</b> ”, Film show on “ <b>Anant Yatra</b>	Co-ordinator	2 <sup>nd</sup> Aug. 2006. 21 <sup>st</sup> Sep. 2006. 29 <sup>th</sup> Nov 5.	PWC
29.	Bihar Vigyan Congress. Organized by:- BCST, Govt of Bihar	Organisation Committee member and <b>Editorial board member</b>	28-29 Feb 07	<b>BCST-DST, Govt. of Bihar</b>
30.	“ <b>Vigyan ke teen sopan</b> ” <b>Khoj, Sodh Aur Bodh</b> , A Countrywide Programme on Science and technology popularization built around an exhibition train – <b>Science express ( A journey in to the future of Scientific discovery)</b> at Patna. This Science express train was developed by <b>German Plank Society, Govt. of Germany</b> and DST, Govt. of India, Organized by :- NCSTC-DST, Govt. of India, Science For Society Bihar.	Coordinator	2-29 December 2007	<b>Patna Dist.</b> Railway station <b>Useful for UG PG, Ph.D level students and Faculty member</b>
31.	Appointed as a in Science exhibition (+2 Level),	<b>Chair of Judges</b>	Date- 24 <sup>th</sup> Dec 2005	B.D. Public School, Patna
32.	<b>Thrill of Scientific research at nanoscale- Scientific session</b>	Coordinator	2 <sup>nd</sup> Dec 08,	PWC

## **Additional Consultancy/Extension services offered**

1. Conducting **M.Sc** teaching in NanoPhysics , Statistical Physics and experimental Physics as a Visiting faculty at Nalanda Open University ,Patna, in academic session in 2007-08, 2008-09 , 2010-2011 and 2011- 2012 for M. Sc , 5<sup>th</sup> and for 6<sup>th</sup> Year
2. Teaching as a Visiting faculty to 1<sup>st</sup> year course of **Engineering graduate** students of vidyadaan Institute of Technology & Management, Arion, Buxar, Bihar under Aryabhata Knowledge university Patna in academic session 2010-2011, 2011-2012
3. Participated as a member of the **Evaluation Team** for 18<sup>th</sup> , 19<sup>th</sup> , and 20<sup>th</sup> National Children Science Congress, Bihar State on 16<sup>th</sup> Nov. 2011, organized by- Science for Society Bihar, Member, **NCSTC-Delhi. This Science Congress was catalyzed by DST-Govt. of India**
4. Conducted the Science Exhibition as one of the **Judges for evaluating the Science projects** at D.A.V School, Patna, B.D.Public School Patna in academic session, 2010-2011, 2011-2012.
5. **Syllabus committee member of Bihar School Examination Board-Higher Secondary level**, Patna on 29<sup>th</sup> Sep 2011 and examiner of examined copies of I. Sc exam-2012
6. Participated as a member of the **Evaluation Team** for 39<sup>th</sup> Jawahar Lal Nehru Science Exhibition-2011-12 for Child Scientist , Bihar State on 11<sup>th</sup> Nov. 2011, Organized by- **State Council of Educational Research and Training(SCERT), MHRD, Govt.of Bihar**
7. As a **Master Resource Person** of **International Year of Physics-2005**(Proclaimed by United Nation) **International Year of Astronomy-2009**(Proclaimed by United Nation) and **Senior Resource person** of Utsahi Physics Teachers, Coordinated by **Prof. H.C.Verma, Dept. of Physics, IIT Kanpur,** Compaigaining **in Revitalization of Physics Education** across the country India



## Conferences attended : International

1. International Conference on **Magnetic Materials and their Applications for 21<sup>st</sup> Century**, at National Physical Laboratory(NPL) New Delhi and, **Date- 21-23 Oct 2008**
2. International Conference on “**Human values and Ethics in the global scenario**”, **Bangalore**, Organized by- The Art of Living foundation India, Date- 17-19 Feb 2009
3. 1<sup>st</sup> Global Bihar Science Conference at Science College, Patna University, Organized by- Bbrain Devlopment Society, Catalyzed and supported by- **Patna University**, Date-5-7 May 2008.
4. 2<sup>nd</sup> Global Bihar Science Conference at Commerce College, Magadh University, Organized by- Bbrain Devlopment Society, Catalyzed and supported by-Magadh University, Bodh-Gaya, Date-30 Jan – Feb 1,2009
5. International Conference on “**Recend Trends in Life Sciences Researchers I, Natural resources management, sustainable Devlopment and Human welfare**”, Date- 27-29June 2009., Venue- Vinoba Bhave University Hazaribagh.

## Conferences attended: National Level

6. UGC sponsored National Conference on “**Environmenal education for sustainable life style**”, venue- **Patna Women’s College (Patna Univ)**, Date- 10-11 Feb 2006.
7. **National Conference on “Convergence with Physics”** at SNTI Auditorium **Jamshedpur** (Jharkhand), Organized by- Deptt of Physics, Jamshedpur Women’s College ( Ranchi Univ), Date-10-11 Oct 2006.
8. “**Technical discussion on different aspects of Physics**”, Venue- **P.G Deptt of Physics, L.S. College Muzaffarpur**, Organized by- Scientific Technical and Vocablurry Commission, **Ministry of HRD, Deptt of Higher education, Govt of India**, Date- 15-17 April 2008.
9. MSI, UGC and DST Sponsored National Conference on “**Nanomaterials and Nanotechnology**” at Deptt of Physics, **University of Lucknow**, Date- 08-10 December 2007
10. **UGC and DST** sponsored “**Recent trends in Condensed Matter Physics**”, 28-29March 2007, Organized by- University Deptt of Physics, **Bhagalpur University**
11. **National Conference for Senior Resource Person Of Utsahi Physics Teachers Group, IIT Kanpur Project, 7-9 June2010, Panjab Univ Chandigarh**
12. **3<sup>rd</sup> Bihar Vigyan Congress, 2-5 April, 2010, DST, Govt. of Bihar**

## **Workshops/ Seminars/ Symposiums Attended: International**

11. International Workshop on “**Frontiers in Nano-biotechnology**” at Allahabad University, Organized by- **University of Allahabad**, Date-1<sup>st</sup> Dec 2006.
12. International Seminar on IPPNW south Asian Regional Seminar for **Peace and Development** ( **60<sup>th</sup> Herosima and Nagasaki day**), Venue- L.N. Mishra Institute, Patna, Date- 6-9 August 2005, Organized by- Indian Doctors for Peace and Development- Bihar Chapter(IDPD).
13. **Scientific foresight-2007**, A Global Symposium on contemporary Science and Technology, Date- 22-24 December 2007, Organized by- Department of Science and Technology, Govt. of Bihar
14. **Scientific foresight-2008**, A Global Symposium on contemporary Science and Technology, Date- 20-22 December 2008, Organized by- Global Bihar Group
15. **Sweedan – India Scientist Interaction meet on Nanomedicine** at Patna Medical College , Date-15<sup>th</sup> Jan. 2009 Organized by- DST, Govt. of Bihar and Bbrain Development society.

## **Workshops/ Seminars/ Symposiums Attended:National Level**

16. A **National Seminar on “Relavance and dimension of Nanotechnology for the development of Bihar”**, Venue- Patna, Organized by- Marwari Siksha Samiti, Patna, Date- 10<sup>th</sup> Feb2007.
17. **UGC sponsored National Seminar on Atomic and Molecular Physics**, Venue- University Deptt of Physics, J. P. University Chapra, Date-15<sup>th</sup> March2007.
18. National Workshop on **Innovative Physics Teaching at I.I.T Kanpur**, organized by- Vigyan Prasar, Govt of India, Deptt of Physics I.I.T Kanpur, Date-8-14June-2007.
19. National Workshop on **Innovative Physics Teaching at I.I.T Kanpur**, organized by- Vigyan Prasar, Govt of India, Deptt of Physics I.I.T Kanpur, Date- 15-21 June-2005.
20. National Workshop on **Innovative Physics Teaching at St. George College Agra**, organized by- Vigyan Prasar, Govt of India, Deptt of Physics I.I.T Kanpur, Date- 29-31May 2009
21. National workshop on carrier counselling and training in **science and engineering** at Jagdamb College Chapra(J.P.Univ), Date- 8-10 Oct 2007.
22. Participated in **one day seminar on Nobelprize in Physics -2007** at Deptt of Physics, Science College Patna, Date- 3<sup>rd</sup> Nov 2007.

23. Participated as **Resource Person in National workshop to produce a module on Appreciating Physics in everyday life and Physics for Consumer at Guwahati**, Date –13-15 June 2006, **Organized by- NCSTC-DST Govt of India and DST, Govt of Assam.**
24. **National Workshop in Innovative Physics Teaching** at D.P.S Patna, Date- 17-22 June 2006, Organized by- Takshila education Society and Anvesika-Kanpur (IAPT).
25. **“Master Resource Person Training Programme of World Year of Physics”** at Institute (I.O.P) of Physics **Bhubeneshwar (Orissa)**, Eastern Zone (National level), Date-6-9 August 2005.
26. Participated as a Delegates in U.G.C. Sponsored National Seminar on **“Plastic Waste – A Hazard to Environment, A Boon for road strength”**, Date- 23<sup>rd</sup> May 2008, Venue- Deptt of Chemistry, College of Commerce Patna, Magadh University Bodh-Gaya.
27. Participated in Training Programme on **“Preparation of Self learning materials: Methods and Strategies”**, Date- 30<sup>th</sup> March 2008, Venue- Nalanda Open University Patna.
28. Participated as a resource person in a programme **“ Identification and nurturing of Talents in Science education**, Date- 13<sup>th</sup> Sep 08, Venue- Deptt of Physics, Patna Womens College, Patna University
29. Participated in a workshop on **“ Relavance and contributions of Lev Landue**, Birth centenary year celebration, J.D.College, Jayprakash Univ Chapra, Date- 20-21 Nov 2008.
30. National seminar on **“Nanomaterials in Cancer treatment”** at Mahavir Cancer Institute Patna, Date- 1<sup>st</sup> March 2009
31. **Master Resource person of International Year of Astronomy- Total Solar Eclipse, 22<sup>nd</sup> July 2009**, G.B. Pant University, Amritsar, Date- 30 June-2 July 2009.
32. Participate as a delegate in **“ Stand up and Speak out programme”** of United nation and The **Art of Living foundation against poverty and for the behavior development goals**. Place- Patna. Date- 16-17 Oct 2007,.,Organized by :- The Art of Living Patna & Unicef .

### **Paper presented: International Level**

1. Ni-Zn ferrite Nanoparticles and their applications,” Presented in International Conference on **magnetic materials and their applications for 21<sup>st</sup> century**, at **National Physical Laboratory (NPL)** and, Date-21-23 Oct 2009.2.
2. **Magnetic Nanoparticles in Biological Sciences: a review**,” Presented in international conference on recent trends in life sciences researchers I, **natural resources**

**management, sustainable Development and Human welfare-** 27 June 2009, Vinoba Bhave University, Hazaribagh,

3. Zinc ferrite nanoparticles synthesis and characterization presented in 1<sup>st</sup> **Global Bihar Science conference**, 9 May 2008, Venue- Science College, Patna university
4. **Photo luminance ehavior ferrite nanoparticles**, presented in 2<sup>nd</sup> Global Bihar Science Conference, 30 Jan-1 Feb, Venue- College of Commerce, Patna, Magadh University.

### **Paper presented: National Level**

5. **“Some possible Technological application for Nanocrystalline Ferrites”**  
Synthesized through chemical route, Presented in 2<sup>nd</sup> Bihar Vigyan Congress, Patna (26-28 Feb, 2007) .
6. “X-Ray Diffraction- an investigation tool for Nanomaterials”, Presented in UGC Sponsored National UGC- Conference on Convergence with Physics, **Jamshedpur**,
7. Synthesis of ferrite Nanoparticles through citrate Precursor Technique, presented in UGC behavior, National conference on condensed Matter physics, deptt. Of Physics, **Bhagalpur University** (March28-29, 2007).
8. “Structural and Magnetic Behaviour of Cobalt Ferrite nanoparticles prepared using chemical route,” presented in **UGC sponsored National Seminar on Applications of Nanoscience and Nanotechnology** at Patna Women’s College, Patna university, Date- 12<sup>th</sup> Sept, 2008.
9. **“Today’s technological Innovations owe their genesis to Landau’s Theories,”** presented in National Workshop- UGC Sponsered, Jay Prakash University, Chapra, 22 Nov 08
10. Presented chart and display model on “nanotechnology” (Man made and natural) at Gandhi maidan, patna for **Public awareness about nanotechnology on the occasion of Republic day (26<sup>th</sup> Jan2006)**, ehavior by- BCST- Govt. of Bihar.
11. “Ni-Zn Ferrite Nanoparticles: Synthesis and characterization, Presented MSI, UGC and DST Sponsored National Conference on “Nanomaterials and nanotechnology” at Deptt. Of Physics, **University of Lucknow**, date-10 december 2007.

## Educational Qualifications:

S. No	School/ College/ Univ	Examination	Subject	Percentage of Marks	Division	Year of Passing
1	Nalanda Open University, Patna	Post-Doc	Ferrite Magnetic Nanomaterials.	-	-	2009
2	<b>Patna University Science College</b>	<b>Ph. D</b>	Ferrite Magnetic Nanomaterials.	-	-	<b>2008</b>
3	A.N. College, Patna <b>'A'-Grade by NAAC-UGC and CPE status by UGC *</b> Magadh Univ, Bodh-Gaya	<b>M. Sc</b>	Physics	<b>61.25</b>	<b>First</b>	<b>2003</b>
4	A.N. College, Patna <b>'A'-Grade by NAAC-UGC and CPE status by UGC</b> Magadh Univ, Bodh-Gaya	<b>B. Sc</b>	Physics	<b>55.1</b>	<b>Second</b>	<b>1999</b>
5	M.S. College, Bhagalpur B.I.E.C, Patna	<b>I. Sc</b>	Phy, Chem, Math, Eng, Hn	<b>69</b>	<b>First</b>	<b>1994</b>
6	U.N.H.School Vidyapuri, Purnea <b>B.S.E.B, Patna</b>	Matriculation	N.Sc, S.Sc, Math, Eco, Snk, Hn	<b>64.5</b>	<b>First</b>	<b>1992</b>

Worked as an Assistant Professor at Dept. of Physics, Patna Women's College, Patna University since Aug 04. ( A'-Grade by NAAC-UGC with CGPA 3.51 out of 4 and CPE status by UGC)

\* **Pre-Doctoral Research:** from April 2003 –Oct 2004: Woked on Chaos and Astro – Physical Jet, at Dept. of Physics, Patna University.

\* **Doctoral research:** I did my Ph. D on the topic “Study of magnetic behavior of Some Nanocrystalline ferrite” from Patna University in May 2008 ( Reg. Feb 2005) under the supervision of **Dr. Amarendra Narayan, Dept. Of Physics, Patna University, Science College.** I worked in collaboration with **Prof. H.C.Verma, Dept. Of Physics, IIT Kanpur, Dr. R.K.Kotnala, Head, Magnetic Std. Lab, National Physical Laboratory(NPL) New Delhi, Prof. Avinash C.Pandey, Nanotechnology Application Centre, University of Allahabad and Dr. Chandan Upadhyay, Institute of Technology, Dept. Of Materials Science, I T, B.H.U.**

\*\* **Post-Doctoral Research:** I worked as a **Post-Doctoral Research** Fellow in Project titled “ Study of magnetic ehavior of Some Nanocrystalline ferrite” funded by Nalanda Open University( **NOU**), Patna. This project was sanctioned for a period of one year ( 14<sup>th</sup> March 2008 to 30<sup>th</sup> April 2009) by Nalanda Open University Patna under Prof. Asheshwar Yadav, Principal investigator- cum chief co-ordinator, School of pure Sciences, P.G Section, NOU ( **Former Vice Chancellor, B.R.B.U, Muzaffarpur, Prof. Of Physics, Patna Univ, Science College and presently Director, V.V. Ins. Of Technology, Purnea**). This University named on **ancient Nalanda University** and established by act of State legislative council.

**CPE- College with Potential for Excellence and NAAC- National Assessment and Accreditation Council- UGC, India**

## Details of Employment

S. No	Institute	Position held	Nature of duty*	Date of Joining	Date of Leaving	Additional remarks
1.	<b>Patna Women's College**</b> Patna University 'A'-Grade by NAAC-UGC and CPE status by UGC	Assistant Professor	1. <b>Teaching, Learning &amp; Evaluation, and Co-Curricular activities</b> 2. Conducting Research project under College with Potential for Excellence (CPE) and Basic Scientific Research (BSR) Scheme of UGC, India	Aug 2004	2 <sup>nd</sup> Sep 2013	1. Actively involve in Teaching-learning & Evaluation, Co-Curricular activities and guiding (UGC-Sponsored) research projects. 2. Engaging Counseling and consultancy services in a state and outside too

- **Teaching-Learning & Evaluation and Co-curricular activities Includes:**

Teaching ( Theory and Practical Classes), organizing seminars, symposium, guest lectures, workshops . Sports, Alumnae meet, Cultural activities, College day, Annual day, Research journal, Film shows, paper presentation, Revitalize Physics education through low cost/No cost experiments, Guiding research project under CPE & BSR scheme of UGC, India, various core committee member such as **Quality enhancement Plan**, Dept. of safty monitor/ safty officer, GES classes and examination duty etc. These activities develop critical attitude and clear comprehension while dealing with their subjects, not only in the classroom but outside as well. Also these curricular drilled our students and disciplined to face the challenging society in every respect.

**CPE and BSR Research Project:** To promote the Scientific Research culture, UGC has initiated Research Project oriented Science education in CPE status Colleges with 'A' Grade Institution of India. In this Scheme slected students studying in B.Sc final year are allowed to do research project to Explore their potential, to stimulate genuine interest in Science and infuse creativity and Scientific temper. I have supervised total **16 research project from 2004 to 2012** at patna Women's College( Work reported in Reviewed Journal Explore and IRIS)

\*\* Patna women's College is Constituent unit of Patna University is 'A' Grade institution with a cumulative Grade point average (CGPA) of 3.51 out of 4 and also College with potential for excellence status (CPE) status accorded by UGC, was established in 1940. This institution functions through a multitier system of organization that includes: The management, The Governing Body, The principal etc. The governing body is the highest decision making body and is strictly vigilant and performs a supervisory role in the governance of the institution. The Prinicpal functions at the head as the overall coordinatior and centre of authority.



## #. Field of Specilization:

Ferrite Magnetic Nanomaterials & Revitalization of Physics Education through Low cost/ No cost Experiments ( +2, UG and PG level)

### Contacts

#### Office

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& Nanotechnology

Aryabhata Knowledge University patna

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#. Date of Birth : 1<sup>st</sup> March 1978

#### Permanent

Dr. Rakesh Kr Singh  
C/o- J.P.Singh( Teacher)  
Kasamra, Dhamdaha, Purnea, B.Kothi

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#### Present Address®

Dr. Rakesh Kr Singh  
C/o- Raghubansh Pd Singh  
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Mob-09304197595

#### References:

1. Dr. Amarendra Narayan,  
Dept. of Physics, Patna University,  
Science College  
[Email-amarendra.nrn@gmail.com](mailto:Email-amarendra.nrn@gmail.com)
2. Prof. H.C. Verma  
Deptt. of Physics, IIT Kanpur  
[Email-hcverma@iitk.ac.in](mailto:Email-hcverma@iitk.ac.in)
4. Principal  
Patna Women's College,  
Patna University  
Bailey road, Patna-1
4. Prof. A.Yadav  
Former Vicechancellor, BRBU,  
Muzaffarpur  
Mob- 09430559182



Worked as a Assistant professor in the Deptt. of Physics, Patna Women's Collage from Aug.2004 Aug.2013

**Engaged as Resource Person/ Appointed : In Workshop**

S. No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
1.	National Conference on Nano-Biotechnology	20 <sup>th</sup> June 2012, 10.a.m-11.am, Patna	Mahavir Research Institute, Phulwarisarif, Patna	Multifunctional Magnetic Nanoparticles in Biological Science
2.	Regional Workshop for Teachers of Eastern Bihar for 20 <sup>th</sup> Children Science Congress	8 <sup>th</sup> June 2012 12-2.00 p.m Khagaria-Dist, Bihar	Science for Society, Bihar, NCSTC-DST, Govt. of India	Energy Resouce: Explore, Harness and Conserve
3.	Innovation in Science persuit for Inspired Research( INSPIRE)	16 <sup>th</sup> June 2012 10-11.30 a.m J.D.College, J.P.Univ, Chapra	J.D.College, J.P.Univ,Chapra, DST-Govt. of India	Science Education and Global Personality
4.	Kilkari: Nuture Young Brain in Scientific creativity, Expert as a Judges in National-East Zone, India	8-9 Sep 2011	Kilkari, MHRD, Govt. of Bihar	Learning Science through Hands on Experience
5.	Nuture B. Sc Physics students for Higher studies and Research	11 <sup>th</sup> Dec 2011	Magadh Mahila College, Patna University	Nuturing and identification of B. Sc students in Higher Education and Research
6.	State level Workshop for Teachers of district of Bihar of 19 <sup>th</sup> Children Science Congress	23 Oct 2011 Regional Seondry School Madhubani, Bihar	Science for Society, Bihar, NCSTC-DST, Govt. of India	Innovation in Science persuit for Inspired Research( INSPIRE)
7.	In UGC Refresher Course in Physics for College/ University Teachers	9 Feb 2010	<b>UGC Academic staff College Patna University</b>	Photoluminiscent properties of Ferrite Nanomaterials
8.	National Science Day- 2012 & 2011	28 <sup>th</sup> Feb 2011 28 <sup>th</sup> Feb 2012	Simultalla Resedential School of MHRD, Govt. of Bihar Dist- <b>Jamui</b>	Finger Print of the Universe and national Science Day
9.	National level Summer School Training Programme for Teachers Of Govt. Engineering Colleges	27 <sup>th</sup> June 2008 National Institute of Technology (N.I.T) Patna	<b>National Institute of Technology (N.I.T) Patna</b>	Talk on "Growth, Characterization and Applications of Ferrite Nanoparticles"

## Engaged as **Resource Person/ Appointed: In Workshops**

Continude of page.

S.No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
10.	7 days National Workshop of National workshop of Innovative method of teaching Physics.	8-14 June 2007 <b>Dept. of Physics IIT Kanpur</b>	Dept. of Physics IIT Kanpur Vigyan Prasar Govt. of India	Innovative Physics Teaching”
11.	International Year of Physics	14 <sup>th</sup> Sep 2006 Banka Bhagalpur Univ	Sarvoday College <b>Banka</b> T.M Bhagalpur Univ), Catalyzed and supported by- <b>NCSTC-DST, Govt. of India</b>	International Year of Physics & Nanotechnology
12.	Teachers Orientation workshop on Physics Learning	5-6 Oct 2006	<b>Bokaro-steel City, Jharkhand</b>	innovative Physics Teaching”
13	National workshop to “ <b>produce a module on Appreciating Physics in everyday life and Physics for Consumer</b> ” at <b>Guwahati</b>	<b>IIT Guwahati</b> 3-5 June 2006	NCSTC-DST Govt of India and DST, Govt of Assam.	Produce a module on Appreciating Physics in everyday life and Physics for Consumer”
14.	Teachers Orientation workshop on Physics Learning	26 June 2009 <b>Sunbeam School Varanasi</b>	<b>Sunbeam School Varanasi</b>	innovative Physics Teaching
15.	International Year of Astronomy: Teachers workshop of 30 districts of Bihar	15 <sup>th</sup> July 2009 S.K.Science Centre Patna	SCERT-MHRD, Govt. of Bihar Science for Society Bihar S. K.science Centre, Patna	Role of Keplers And Galileo in Shaping the society.
16.	Motivational Contact programme for +2 students of Bihar,	22 <sup>nd</sup> Sep 2010 Mahavir research Institute, Patna	Mahavir Research Institute <b>NCSTC-DST, Govt. of India</b>	Jewels of Indian Physics
17.	5-day workshop on “Learning Physics through hands on experiment”	19-23April 2006 D.P.S. Patna	Takshila education society and Science for Society, Bihar	Learning Physics through hands on experiment
18.	Teachers Orientation programmes	17 July 2009	SCERT-MHRD, Govt. of Bihar	Current Devlopement in Science & Technology

## Engaged as **Resource Person/ Appointed: In Workshops**

Continude of page.

S.No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
19.	Teachers & Students Orientation Programme	19 <sup>th</sup> December 2011, Kamur, Dist- Sasaram	Maharana Pratap College, Mohania, Kamur, Dist- Sasaram <b>Verr Kuar Singh Univ, Arah</b>	Revitalization of Physics Education through Low cost/ No cost Physics
20.	Teachers workshop	5 September , 2011	State Council of Educational Research & Training, <b>HRD, Govt. of Bihar</b>	Revitalization of Physics Education through Low cost/ No cost Physics
21.	4-hour Workshop for B. Tech 1 <sup>st</sup> year students	9 <sup>th</sup> March , 2011	Vidya Vihar Institute of Technology, Purnea Aryabhata knowledge universit Patna	Revitalization of Physics Education through Low cost/ No cost Physics
22	two-day Teachers workshop	5-6 <sup>th</sup> Oct 2009, Sanbeem, Varanas	Sanbeem, Institute Varanasi	Innovative Physics Teaching
23.	One-day Teachers workshop	18 <sup>th</sup> April 2008.	Dr. D.Ram D.A.V Public school Patna	Innovative Physics Teaching
24.	International Year of Astronomy-09	15 July09	S.K.Science Centre, Patna, SCERT, Patna, BCST, Govt. of Bihar,	Compaining – Total Solar Eclipse, 22 July-2009, Largest celestial drama of this century
25.	International Year of Astronomy-09	20 <sup>th</sup> July 09.  Science College, Patna University	BCST, Govt. of Bihar & Science College Patna	Compaining – Total Solar Eclipse, 22 July-2009, Largest celestial drama of this century
26.	International Year of Astronomy-09 of Vigyan prasar club member	21 <sup>st</sup> July 09	Vigyan Prasar Govt. of India	Compaining – Total Solar Eclipse, 22 July-2009, Largest celestial drama of this century

**(27.) Talks/ programmes on Electronics media**

Talk on Doordarshan (DD) on the topic “Nurture scientific temper among children and Natural process of Learning Science ,Date of broadcast- 8<sup>th</sup> August, 2011

**Engaged as Resource Person/ Appointed : In Conference**

S. No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
27.	3 <sup>rd</sup> Bihar Vigyan Congress-2011	10 <sup>th</sup> June 2011	BCST-DST, Govt. of Bihar	Nano Science & Nanotechnology
28.	<b>International Museum Day</b>	May 2011	K.Science Centre Patna, National Council of Science Museum, Govt of India	<b>Role of Museums/ Science Centre in Science Education”</b> on the occasion of <b>International Museum</b>
29.	National Conference on “Role of Science & Technology” for Modern advancement in Society	Arvind mahila College, Patna	Arvind mahila College, Patna UGC-Govt.of India	Science Education & Research for sustainable devlopement
30.	. in Bihar Inspire Internship Science Camp, <b>Initiative of MHRD &amp; DST-Govt. of India</b>	9 <sup>th</sup> Aug 2011	J.D.College J.P.University Chapra	Science Education & Research a career for sustainable Devlopement.
31.	National <b>Conference</b> on “Technical Discussion of different aspects of Physics”,	17 April 2008.Venue- Post Graduate Department of Physics, L.S.College Muzaffarpur, B.R.B.U, Bihar University Muzaffarpur	Scientific Technical and Vocablurry Commission, <b>ministry of MHRD, Dept. of Higher education, Govt of India</b>	Growth, Characterization and Applications of Ferrite Nanoparticles through Chemical route
32.	National Conference on “ <b>Science &amp; Mathematics-Problems and Solution</b> ”,	March 5,2009- Dr. Jha Hall, Secretariat, Patna	SCERT, Patna HRD Govt. of Bihar	“Learning physical Science through hand on Experiment”

S. No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
33.	<b>Technica Science &amp; Technology Based Reseach festival</b> for Research project ehavior at <b>Birla Institute Technology(B.I.T)</b>	April 2009.	<b>Birla Institute Technology(B.I.T)</b>	<b>Technica Science &amp; Technology Based Reseach festival</b> for Research project evaluator
34.	2 <sup>nd</sup> & 3 <sup>rd</sup> Bihar Vigyan Congress-2010 & 2011	5 <sup>th</sup> April2010 7 <sup>th</sup> may 2011	BCST-DST, Govt. of Bihar	Nano Science & Nanotechnology
35	Technological Applications of Nanocrystalline Ferrites” in <b>UGC Sponsored, National Conference on “ Relavance and Dimention of Nanoscience and Nanotechnology for the Devloperment of Bihar</b>	21 <sup>st</sup> April 2008 B.S College Danapur, Patna	<b>UGC</b>	Technological Applications of Nanocrystalline Ferrites
36	<b>16<sup>th</sup> state level Childrens Science Congress Conference-08</b>	27-29 oct 2008. Place- Siwan, Bihar	Organized by :- SCERT, BCST, Govt of Bihar and Science for Society Bihar, Catalysed by :- NCSTC-DST, Govt of India, New Delhi	Chair of Judges for <b>project ehavior</b> and as a <b>Scientist in the programme “ Face to Face ” with child Scientist</b>

37. Appointed as a **academic** resource person for **Nurturing and Identification of talents in Science education and Research** in a prgramme – “**Vigyan ke teen sopan**” **Khoj, Sodh Aur Bodh**, A Countrywide Programme on Science and technology popularization built around an exhibition train – **Science express ( A journey in to the future of Scientific discovery)** at Patna. This Science express train was developed by **German Plank Society, Govt. of Germany** and DST, Govt. of India. Organized by: - NCSTC-DST, Govt. of India, Science For Society Bihar. Date: - 26-29 December 2007.



**Engaged as Resource Person/ Appointed: In Conferences, Continued page. No**

S. No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
38.	Orientation camp of Teachers of Central Bihar of 20 <sup>th</sup> Children Science Congress-2012 for Project preparation	15 <sup>th</sup> July 2012 Science college Patna	Science for Society Bihar	Energy Resources
39.	seminar on “Chadrayan: Promises & Concerns”	27 August 2009	<b>Govt. of Bihar</b>	Chair of Judges
40.	<b>Physics Education and Future Prospects</b>	30 <sup>th</sup> Jan 2008, <b>T.N.B College, Bhagalpur, T.M University,</b>	<b>T.N.B College, Bhagalpur, T.M University</b>	Synthesis of nanoparticles through chemical route and physics teaching through low cost/ no cost experiments
41	<b>Seminar on Appreciating Physics in Daily life</b>	28 <sup>th</sup> Feb 2006, National Science day, Organized by- Patna Science College and Science		<b>Appreciating Physics in Daily life</b>
42	<b>World year of Physics</b>	, -28 <sup>th</sup> Oct 2005.	<b>National Council of Science Museum, Govt. of India</b>	<b>World year of Physics</b>
43	<b>World year of Physics</b>	28 <sup>th</sup> Nov 2005 S.K.Science Centre Patna	S.K.Science Centre Patna	<b>subject expert and quiz master</b>
45	“ <b>Innovation in Science</b> ” with child scientist,	19 <sup>th</sup> July 2007	Kilkari, <b>Human Resource Development</b>	Chair of Judges

## Engaged as **Resource Person/ Appointed: In Seminars**

.S. No	Name of the Events	Date , Time, Place	Organized by, Sponsored by	Topic
46.	Orientation session of B.Ed students and Faculty member	12 <sup>th</sup> Jan 2012	Dept.of Education, Patna Women's College	Learning Physics through Low cost/ No cost experiment
47.	<b>National Science Day-2006</b>	28 <sup>th</sup> Feb 2006	S.K.Science Centre, Govt. of India	Appreciating Physics in Daily life
48.	Orientation session of B.Sc students and Faculty member	8 <sup>th</sup> July 2006	M.D.D.M, College, Muzaffarpur	Learning Physics through Low cost/ No cost experiment
49.	Chair of Judges in Science exhibition at B.D.Public School(+2) Patna	10 <sup>th</sup> Dec 2009	B.D.Public School(+2) Patna	Science education and Society
50.	Chair of Judges in a state level seminar on "Chadrayan: Promises & Concerns"	27 August 2009	SCERT, Patna, National council of Science museum, Kolkata	<b>Chadrayan: Promises &amp; Concerns</b>
51.	Chair of Judges in Science exhibition at D.A.V Public School(+2) Patna	12 Jan 2012	D.A.V Public School(+2) Patna	Science education and Society

**52. Delivered a talk as a Resource person in refresher course of Physics teachers at IIT patna on 5<sup>th</sup> August 2013**

**53. Delivered a Lecture as a Resource person in a Seminar" learning through hands on experience" at Dept. of B.Ed, Patna Women's College on 6<sup>th</sup> July 2013.**

**54. Participation in a seminar as a Resource Person at Vikas Bhawan, patna on Innovation in Cutting edge research and economic growth of Bihar on 19<sup>th</sup> Aug. 2013**