

CURRICULUM VITAE

Dr. Santosh Kumar

Professor

Department of Physics

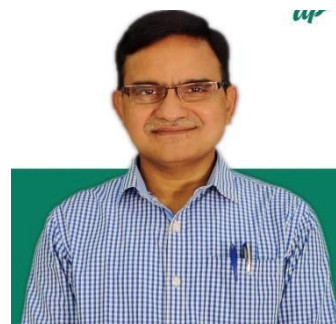
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Google Scholar

<https://scholar.google.com/citations?user=j-G3FVYAAAAJ&hl=en>



Academics

M.Sc, PhD

RESEARCH INTEREST:

Atomic Collision, Nano- Materials, Functional Metal Oxides, Super Capacitors.

RESEARCH PUBLICATIONS:

1. Structure, ferroelectric and magnetic behavior in Mn doped 0.75 BiFeO₃-0.25 BaTiO₃ ceramics, MK Shamim, A Ranjan, **S Kumar**, S Sharma, S Kumar, Materials Chemistry and Physics, 127302
DOI: <https://doi.org/10.1016/j.matchemphys.2023.127302>
2. Spin-polarized room temperature ferromagnetism in co-doped ZnO synthesized by electrodeposition, **Santosh Kumar**, R Kumar, R Kumar, P Vaibhav, RK Singh, N Kumar, RK Singh, Chinese Journal of Physics 73, 622-633, 2021
DOI: <https://doi.org/10.1016/j.cjph.2021.08.012>
3. Defect Induced Room Temperature Ferromagnetism and Enhanced Photocatalytic Activity in Ni-doped ZnO synthesized by Electrodeposition, Deepika, Raju Kumar,

Ritesh Kumar, Kamdeo Prasad Yadav, Pratyush Vaibhav, **Seema Sharma**, Rakesh Kumar Singh, **Santosh Kumar**, 2020 *Chinese Phys.B*

DOI: <https://doi.org/10.1088/1674-1056/ab9c0c>

4. He⁺ Impact Double Ionization of Noble Gases, **Santosh Kumar**, Geetanjali, L.K. Jha, Bulletin of Pure and Applied Science, Vol 39(D) No. 1, 2020, Page 80-90
DOI: <http://dx.doi.org/10.5958/2320-3218.2020.00011.1>
5. Structural and Magnetic Properties of Second Row Transition Metal Doped Iron Oxide Nanoparticles, **Santosh Kumar**, Manthan, ISSN-0974-6331 18, 17-31, 2018
6. Synthesis of Transition Metal Doped ZnO Nanoparticles for Its use as an Adsorbent for WasteWater Treatment, **Santosh Kumar**, Manthan, ISSN-0974-6331 17, 18-29, 2017.
7. Structural and Magnetization Studies of Alloy of Immiscible Metals prepared by Electrochemical Method, **Santosh Kumar**, Natural Science Today, ISSN-0972-1908 33 (33), 93-100, 2017.
8. Effect of Al and Fe doping in ZnO on Magnetic and Magneto-transport properties , **Santosh Kumar**, Deepika, Malvika Tripathi, Pratyush Vaibhav, Aman Kumar, Ritesh Kumar, R.J Choudhary, D.M. Phase, **Journal of Magnetism and Magnetic Materials**, 419(2016) 68-73
DOI: <https://doi.org/10.1016/j.jmmm.2016.06.007>
9. Study of Structural Evolution and Room Temperature Ferromagnetism Induced in Electrodeposited ZnO Thin Film due to Cobalt Doping, **Santosh Kumar**, Natural Science Today, ISSN-0972-1908 26 (26), 80-90, 2016.
10. Effective Gravitational Mass of Ay'on- Beato and Garcia Metric, A.K. Sinha, G.K. Pandey, A.K Bhaskar, B.C. Rai, A.K. Jha, **S Kumar**, S.S. Xulu, **Modern Physics Letters A**, Vol.30 Issue 25, 1550120 (2015).
DOI: <https://doi.org/10.1142/S0217732315501205>
11. Synthesis of Ca-Mg Co-Doped Hydrous Ferric oxide Nanoparticles for Structural Evolution and Magnetic Studies, **Santosh Kumar**, Natural Science Today, ISSN-0972-1908 22 (22), 69-82, 2015

12. Mixed Spin Relation in Ir(V)d₄, H.C. Singh, A.K. Jha, **Santosh Kumar**, **Indian Journal of Theoretical Physics**, Vol-61, No-3, 2014
13. Double Ionization of Ne⁵⁺ and Ne⁶⁺ by electron impact electrodeposition, L.K. Jha, M.P. Singh, **Santosh Kumar**, **Eur. Phys. JD. Vol.66 no 5(2012)116**
DOI: <https://doi.org/10.1140/epjd/e2012-20420-3>
14. Magnetic Structure of Fe-Fe Oxide nanoparticles made by electrodeposition, **Santosh Kumar**, Samar Layek, Brajesh Pandey, H.C. Verma, **IJEST Vol.2, No.8, 2010, pg.66-72**
DOI: <https://doi.org/10.4314/ijest.v2i8.63781>
15. Single and Double Ionization of Kr and Xe by electron impact, L.K. Jha, **Santosh Kumar**, O.P. Roy, P. Kumar, **Phys. Scr.77 (2008)116**.
DOI: <https://doi.org/10.1088/0031-8949/77/01/015304>
16. Electron impact single and double ionization of Argon L.K. Jha. **Santosh Kumar**, B.N. Roy, **Eur. Phys. J. D40, 101-106(2006)**.
DOI: <https://doi.org/10.1140/epjd/e2006-00158-3>

Thesis Title

“Atomic Collision” Case studies on ionization of atoms/ions due to impact of charged particles.

POPULAR ARTICLES:

<p>Santosh Kumar, Rakesh Kr, Singh, B.C. Rai, Amarendra Narayan</p>	<p>Popularising Physics through low cost/ no cost experiments</p>	<p>Manthan, Vol-8, 34-35</p>
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Santosh Kumar	NucleoSynthesis	VigyanSanchar, Page 32, 1997, published by Bihar Council of Science and Technology, Patna
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RESEARCH COLLABORATIONS:

IIT-Kanpur, UGC-DAE Consortium for Scientific Research, Indore, IIT-Patna, AKU, Patna

Ph.D SUPERVISION:

1. **Deepika - Synthesis of ZnO based DMS system at nano scale by different preparation routes and their structural characterization. - [Awarded]**
2. **Rajeev Ranjan - Structural, Magnetic and Optoelectronic study of Doped Metal Oxide Nanostructures [ongoing]**
3. **Dheeraj Kumar - Synthesis and Investigation of Transition Metal Doped Functional Metallic Oxides [ongoing]**
4. **Niharika - Charging optimisation for Lithium Ion Battery for Electric Vehicles [ongoing]**

EXPERIMENTAL EXPERTISE:

XRD, Raman Spectroscopy, XPS, VSM, UV Visible Spectroscopy, Photoluminescence, Electrodeposition, Cyclic Voltammetry, Growing Thin Films by Pulsed Laser Deposition,

TEACHING INTERESTS:

Atomic and Molecular Physics, Condensed Matter Physics, Numerical Analysis, Statistical Physics, Optics, Nano-materials, Electromagnetics, Classical Mechanics, Mathematical Physics, Quantum Mechanics.

CONFERENCE PRESENTATIONS:

- Presented a paper on **“Use of Magnetic Nano-Particles for Water Treatment”** in a CSR Conference organized in Savitribai Phule(University of Pune from May 25-26, 2017.
- Delivered a talk on **“Carrier mediated ferromagnetism in Dilute Magnetic Semiconducting System”** on 25th December,2014 in 6th Bihar Science Conference in Magadh Mahila College, Patna.
- Delivered an invited talk on **“Zno Based DMS Systems”** in 5th Bihar Science Conference on November 18,2013 in Arvind Mahila College, Patna
- Delivered a talk on **“Mossbauer and XRD studies of Fe-Cu alloy prepared by electrodeposition”** in 2nd Bihar Science conference 2009 organised by B. Brains development Society in College of Commerce, Patna from **Jan. 30th to Feb.1st, 2009.**
- Delivered a talk on **“Mossbauer and XRD studies of electrodeposited pure iron powder”** in UGC sponsored national seminar on Applications of Nanoscience and Nanotechnology held in the department of Physics, Patna women’s college, Patna on **Sept. 12th, 2008.**
- Delivered a talk on **“Proton Impact Double Ionisation of Pb”** in 1st Bihar Science Conference organized by B. Brains development society held in the dept. of Physics, Patna University, Patna from **May 7th to May 9th, 2008.**
- Delivered invited talk on **“Synthesis of Fe_x Cu_{100-x} by using electrodeposition and their characterization”** in a UGC sponsored National Conference on Relevance and Dimensions of Nanoscience and Nanotechnology for the Development of Bihar, organized by The Department of Physics, B. S. College, Danapur, from **Apr. 19th to Apr. 21st, 2008.** Abstract P – 18
- Made oral presentation of paper **“electron impact single ionization of oxygen”** in 2nd Bihar Vigyan Congress organized by Bihar Council of Science and

Technology, Patna, held at Patna from **Feb. 26th to Feb. 28th, 2007**, Abstract G1.30

- Presented paper entitled “**electron impact double ionization of Krypton**” at XVI National Conference of Atomic and Molecular Physics, held at Tata Institute of Fundamental Research, Mumbai from **Jan. 8th to Jan. 11th, 2007**. Abstract P2/27
- Made oral presentation of paper entitled “**double ionization of Fe³⁺ by electron impact**”, in conference on Atomic and Molecular Physics, held at BRABU, Muzaffarpur, from **Dec. 3rd to Dec. 5th, 2003**. Abstract P – 17

SEMINARS / CONFERENCES CONDUCTED (ORGANISED) :

- **Chairman** of a 10 Days Research Methodology workshop held from 20 September - 01 October, 2024 at College of Commerce, Arts and Science, Patna
- **Convener** of International Conference on Materials Processing and Applications (ICOMPA) - 2023 held from 01-03 March, 2023 at College of Commerce, Arts and Science, Patna
- **Convener** of 36th IAPT (Indian Association of Physics Teachers) National Convention held from 02-04 December, 2022 at College of Commerce, Arts and Science, Patna.
- **Convener** of an international conference “**2nd Bihar Science Conference**” held from January 30th to February 1st 2009 in the college of Commerce, Patna, under the aegis of BBrains development society.
- **Convener** of **UGC Sponsored National Conference on Relevance and Dimensions of Nanoscience and Nanotechnology for the Development of Bihar**, held at The Department of Physics, B. S. College, Danapur, from April 19th to April 21st, 2008.

- **Convener** of one day state level seminar on **Critical Evaluation of Indo – US Nuclear Deal in National Perspective**, organized by the department of Physics, B. S. College, Danapur, on Dec. 12th, 2007.

WORKSHOPS / SEMINARS ATTENDED:

- Attended CSR Lecture Series to enhance Knowledge and abilities of experimental skill in different experimental techniques from September 14-19,2015 in UGC-DAE Consortium for Scientific Research, Indore.
- Participated in **1st NIUS Workshop on “Introductory Computational Science” in Homi Bhabha Centre For Science Education, TIFR, Mumbai from September 29-October 2, 2013.**
- **Attended awareness workshop for university users for collaborative research in Basic and Applied Sciences organized by UGC-DAE Consortium for Scientific Research, Kolkata Centre in Patna Women’s College, Patna from January 9 to 10, 2013.**
- Participated in the **“National Workshop of Utsahi Physics Teachers- 2011 (NWUPT-11)”** Held at **IIT Kanpur** from May 21st to 26th, 2011.
- Participated in National Symposium on **“Nanotechnology: Present Perspective and Future Direction”** held in Mahavir Cancer Institute and research centre, Patna, Bihar, Held from April 9th–10th, 2011.
- Participated in UGC sponsored national workshop on **“Contribution and relevance of Lev T. Landau”**, from November 20-21, 2008 in Jagdam College, Chapra and was a member of steering committee and editorial board.
- Attended five days workshop on Innovative Physics Teaching at IIT, Kanpur from 15 – 20 June 2008 held under the joint aegis of Vigyan Prasar and Anveshika.
- Participated in National workshop on **“Career counseling and Training in Science and Engineering”**, Oct. 8-9, 2007 at Jagdam College, Chapra.

- Participated in the workshop on Atomic and Molecular Physics, held at Rajendra College, Chapra on 15 March, 2007
- Participated in the National Workshop on innovative Physics teaching held from 17 – 22 June 2006 at DPS, Patna under the joint aegis of Anveshika and Takshila educational society conducted by Prof. H. C. Verma, IIT, Kanpur.
- Attended Seminar”Samajik Sangrachna Me Asprishyata Lingbhed, Jativad aur Sampradayikta”, held at Kisan College, Sohsarai, Nalanda and **orally presented a paper** entitled “**Gandhi aur Paryavaran, Ek Anushilan**” on 31.03.2006. The seminar was sponsored by Khadi aur Gramodyog (Govt. of India).
- Attended UGC sponsored state level conference on “**Cancer and AZO-complexes**” at B.S.College, Danapur, Patna from 20-21 March 2005.
- Participated in a workshop of “**Vaigyanik and Takniki shabdawali Aayog**” from Dec. 3rd to 5th 2003 held in the Dept. of Physics, BRABU, Muzaffarpur.

Research Project Completed/ Undergoing:

1. Completed a minor research project as principal investigator in collaboration with IIT-Kanpur on Mechanosynthesis of Iron based alloys, Sanctioned by UGC vide sanction letter no. PSB-009/05-06 dated 21st March 2006 for a period of two years.
2. Completed a minor research project on ZnO based DMS System sanctioned by UGC vide sanction letter no PSB15/12-13ERO Dated 5/2/2013 serial no-214038.
3. Completed a major research project on Use of Magnetic Nano-particles for water treatment sanctioned by UGC-DAE Consortium for scientific research , Indore under CRS bearing No - CSR -IC-MSRSR-12/CRS-220/2017-18/1301, Dated 31st March,2018.
4. Doing a major research project on Biomaterial Template derived metal doped NiCo₂O₄ nanostructures for improved supercapacitor electrode as Co-Principal Investigator sanctioned by UGC DAE CSR, Indore under CRS project vide CRS project number CRS/2022-23/01/656 (Project Duration May 2023 - April 2026).

PROFESSIONAL TRAINING:

- Attended Refresher course in Physics conducted by UGC Academic Staff College, Patna University, Patna from 9th September to 29th September 2008 in the department of Physics, Patna University, Patna and was accredited **grade 'A'**.
- Attended Refresher course in Physics conducted by UGC Academic Staff College, Patna University, Patna from 27th March to 16th April 2006 in the department of Physics, Patna University, Patna and was accredited **grade 'A'**
- Attended UGC sponsored orientation programme conducted by UGC Academic Staff College, Patna University, Patna from 18th August to 14th September 2004 and was accredited **grade 'A'**.
- Attended a refresher course in physics conducted by UGC Academic Staff College, B.R. Ambedkar Bihar University, Muzaffarpur from January 21st, 2015 to February 10, 2015 in the department of Physics, BRABU, Muzaffarpur and was accredited **grade 'A'**.

POSITIONS HELD:

- Had been co-instructor with Prof. H.C. Verma, Dept. of Physics, IIT-Kanour in a MOOC Course on Learning Physics through simple Experiments run by IIT, Kanpur.
- Chairman of Governing Body of SKM College, Jehanabad, Bihar. Have been the chairman of the selection committee of Magadh University for the confirmation of Service of Teachers of SKM College, Jehanabad.
- Elected Treasurer of IAPT regional council, Bihar in office bearer election for IAPT regional council for 2010-2013 and again for 2013-2016.
- Convener of 25 member Global core scientific council constituted by B. Brains development society and also holding the post of Joint secretary of society.
- State Treasurer, Bharat Scout and Guide, Bihar Unit.

WORKED FOR SCIENCE POPULARISATION AS RESOURCE PERSON :

- Conducted a workshop of school children and teachers of Siwan District of Bihar in “Parivartan Campus” Narendrapur, Siwan from February 9-10,2018.
- I have worked for popularization of science as a science propagator. I have conducted a series of workshops on innovative Physics teaching through experimentation among school teachers up to +2 level.
- Have been resource person in inspire internship program.
- Resource Person to train + 2 teachers of Kendriya Vidyalayas of India to enhance their teaching skills through innovative low cost/no cost experiments organized in IIT- Bihta (Patna) from July 18-23,2018.
- Resource Person to train Science Teachers upto +2 of Uttarakhand to enhance their teaching abilities through innovative low cost/no cost experiments organized by UNISED in Dehradun from February 22-26,2018.
- Resource Person to train + 2 teachers of Kendriya Vidyalaya(s) of India to enhance their teaching skills through innovative low cost/no cost experiments organized in IIT- Bihta (Patna) from April 7-9,2017.
- Resource Person to train + 2 teachers of Kendriya Vidyalaya(s) of India to enhance their teaching skills through innovative low cost/no cost experiments organized in IIT- Bihta (Patna) from October 21-23,2016.

BOOK PUBLISHED:

- Authored a problem book for Engineering / Medical entrance Competitive Examinations and PSC Examination published from Gatha Publ. Gaziabad.
- Co-author of a text book in Physics for Class IX Published from Brilliant Prakashan, Patna.
- Co-author of a text book in Physics for Class VIII Published from Brilliant Prakashan, Patna.
- Have authored a chapter in a book of Nalanda Open University.

TEACHING EXPERIENCE:

- Twenty one years teaching Experience at Undergraduate and Post-Graduate Level. (Joined as Lecturer in Physics under Magadh University Service on 9th Aug. 2003).

MEMBERSHIP:

- Member of School Management Committee of Delhi Public School, Patna (DPS,Patna) as Professor Representative.
- Member of Advisory committee of Bihar School Examination Board, Patna
- Life Member of Indian Science Congress.
- Life Member of Indian Society of Atomic and Molecular Physics (ISAMP).
- Life Member of I.A.P.T. and Treasurer of IAPT RC-19, Bihar
- Life Member and State Treasurer of Bharat Scout and Guide.

LANGUAGE PROFICIENCY:

<i>Language</i>	<i>Level of Knowledge</i>
Hindi	Good
English	Good

SKILLS:

- Have confidence and ability to tackle challenging situations and respond promptly to the need of the time.
- Positive and focused attitude.
- Excellent Communication and ability to work collaboratively.

CAREER MILESTONES:

I joined as lecturer under Magadh University Service on 09/08/2003 consequent to my recommendation by Bihar State University (constituent colleges) service commission and subsequent appointment by Magadh University vide memo no 419/GIA dated 07/08/2003. My service as lecturer under Magadh University Service was confirmed w.e.f 09/08/2003 vide Magadh University memo no 39/GIA dated 25/04/2011. I was promoted to the rank of reader on the recommendation of the selection committee and subsequent approval accorded by the syndicate of Magadh University w.e.f. 09/02/2012 vide letter no PC/1083/2017 dated 16/09/2017. I became Associate Professor (academic level 13A) w.e.f. 09/08/2015 as per the

existing statute and provisions of Government. I have been promoted as Professor (academic level 14) with effect from 09/08/2020 on the recommendation of the selection committee and approval accorded by the syndicate of Patliputra University vide memo no R/PPU/1717/24 dated 14/10/2024.

AN INSTINCTIVE TEACHER AND AN ARDENT LEARNER :

I find myself to be a born teacher. I am a passionate learner. I have put in lot of efforts to enhance my teaching abilities, knowledge, skills and discover possibilities of original research. I always try to incorporate innovations for effective teaching and learning.

INTELLECTUAL INVOLVEMENT, ACADEMIC ENDEAVOUR AND OUTREACH ACTIVITIES :

In the past five years I have organized two international conferences in the name of Bihar Science Conference. In one of the conferences, I was the organizing secretary and in the second one co-convenor. I am one of the editors of an online peer reviewed science journal “Manthan”. I have worked a lot for strengthening school physics education and popularizing science and have conducted a number of teachers’ workshops. I have developed some innovative low cost/no cost experiments and a few concept inventories. I was co-instructor with Padma Shri Prof. H.C. Verma, Retired Professor of Physics, IIT-Kanpur as instructor in one of the MOOC courses ‘Learning Physics through simple experiments’ run from the CATD platform of IIT-Kanpur. I have delivered a number of popular talks as well as the invited talks on the topics related to my field of research. I have conducted teachers’ and students’ workshops for conceptual and effective science teaching through low-cost experiments in many of the districts of Bihar.

I have been a member of the curriculum and syllabus revision committees constituted to introduce the semester system at undergraduate level and make the post graduate physics syllabus of the universities of Bihar to resonate with the NET syllabus. This work was assigned by the Hon’ble chancellor, Universities of Bihar.

RESEARCH MOTIVATION :

I have completed two minor research projects sponsored by UGC and one major research project on ‘Use of Magnetic Nano-particles for Water Treatment’ under collaborative research scheme by UGC-DAE Consortium for scientific research, Indore. Presently doing a major research project as Co-Principal Investigator on Biomaterial Template derived metal doped NiCo₂O₄ nanostructures for improved supercapacitor electrode as sanctioned by UGC

DAE CSR, Indore under CRS project vide CRS project number CRS/2022-23/01/656 (Project Duration May 2023 - April 2026).

One student has been awarded a Ph.D. degree under my supervision. Three are presently registered with me.

I have published few papers in highly reputed journals of Elsevier, IOP and other prestigious groups for Example Journal of Magnetism and Magnetic Materials, Modern Physics Letters A, European Physics Journal D, Physica Scripta, Chinese Physics B, International Journal of Engineering Science and Technology, etc.

THE STUDENT WITHIN ME :

I myself have been part of two courses as a student to augment my insight in my subject and widen my vision about recent developments in pedagogy and researches in material science to commensurate to the global standard. They are

1. CSR Lecture Series 1 organized by UGC-DAE, Consortium for Scientific research, Indore from September 14-25, 2015
2. NIUS (National Initiative on Undergraduate Science) workshop on introductory computational science organized by Homi-Bhabha centre for science education, TIFR, Mumbai from September 29 to October 2, 2013.

CULMINATION OF MY KNOWLEDGE AND EXPERIENCE INTO EXPRESSIONS:

I have co-authored two textbooks for school, one for class VIII and the other for class IX in Hindi medium. I have authored one problem book for the preparation of competitive examinations like IIT-JEE etc.

MY ADMINISTRATIVE ABILITIES AND SOCIAL OUTLOOK :

Recently I have been honoured by Rotary Club with Nation Builder Award to recognize my contributions as a teacher. I am IQAC and NAAC co-ordinator of my college. I have been an active and vibrant lion club member and work year long for different issues of societal concern like Health, Environment, Education, Poverty, etc. I have been supporting the activities of an NGO 'Shiksha Sopan' run by the physics department of IIT-Kanpur and am a part of it. I am state treasurer of Bharat Scout and Guide.

Hence, I have dedicated myself to establishing myself as a role model in the field of Physics education with my teaching abilities and contributing to original research. I have been consistently trying to communicate the essence of the pleasure of science to people at all levels as a science propagator.