Faculty Profile: For University Website

DEPARTMENT OF METALLURGICAL & MATERIALS ENGINEERING

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Educational Qualification:	 Ph. D. (2009), Indian Institute of Technology, Kharagpur, W. B., India M. Tech. (2004), Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India
Courses Taught:	 Mineral Processing Metallurgy and Materials Science Synthesis and Properties of Nanomaterials Nanotechnology for Energy systems Materials Thermodynamics Solid state Technology Materials Science and Engineering Self-Assembly and Molecular Engineering Spectroscopic Techniques Nanocomposite Mechanical Properties of Materials
Additional role/ responsibility:	 Head, Department of Metallurgical & Materials Engineering Director (Self-Finance Course) Chairman, Admission Cell
Professional /Administrative Experience:	 Professor (09thJanuary 2021),Department of Metallurgical & Materials Engineering, Central University of Jharkhand, Ranchi, India Head, Department of Nanoscience and Technology (18thJanuary 2018-16th October 2023) In-charge, Research and Development Cell (06th November 2019-29th Sept. 2020)

	 Associate Professor (09thJanuary 2018-08th January 2021), Department of Nanoscience and Technology, Central University of Jharkhand, Ranchi, India Assistant Professor (July 2011- January 2018), Centre for Nanotechnology, Central University of Jharkhand, Ranchi, India Visiting Scientist (January 2012 - January 2013, on leave) at Kansas State University, Manhattan, Kansas, USA Assistant Professor (July 2009-July 2011), Department of Applied Physics, Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India
Awards& Honours	 Fast Track Young Scientists (2011), Department of Science & Technology, Govt. of India Boyscast Fellowship (2010-2011), Department of Science & Technology, Govt. of India. Research Associates (2009), Council of Scientific & Industrial Research, Govt. of India Senior Research Fellowship (2008-2009), Council of Scientific & Industrial Research, Govt. of India Institute Research Fellowship (2005-2008), Indian Institute of Technology, Kharagpur, W. B.
Research Area:	• Materials Science, Energy Materials, Photocatalytic hydrogen evolution, High temperature Dielectric materials, Multiferroics materials
Research Guidance:	 Ph. D.: 07(Awarded:04; Submitted: 01; Pursuing: 02), M. Tech: 40, B. Tech.: 20 1. Development of Ni Loaded CdS photocatalysts for Photocatalytic water splitting hydrogen production and dye degradation applications (Dr. Vikash Kumar, 2022, Awarded) 2. Synthesis of graphene-based metal oxide nanocomposites for supercapacitor applications (Dr. Soumita Jana, 2019, Awarded). 3. Synthesis and characterization of nanocomposites structured electrode materials and applications on Li-ion batteries (Dr. ParameswarKommu,
	 2018, Awarded). 4. Study of structural, mechanical and corrosion properties of TiN coated plasma nitrided austenitic stainless steel for bipolar plate application (Dr. Pankaj Kumar Singh, 2018, Awarded)
Brief introduction:	Dr. Gajendra Prasad Singh is actively involved in teaching and Research & Development activity for the development of various types of nanomaterials for

	energy and environmental applications. He is also involved in R&D in collaboration with IIT and other national importance institutes.Dr. Singh has a considerable teaching and research experience of around twelve years in various capacities at different levels. He has made immense contributions in the areas of development of low cost nanomaterials, heterostructure nanomaterials and it composites for the hydrogen production from water-splitting and pollutants mineralization, energy storage, magnetic and dielectric applications. He has published one International patent, twenty six research articles in different SCI journals of international and national repute, and six book chapters. The three Ph.D., forty M. Tech.and twenty B. Tech. students have been awarded under his guidance. Many more are still pursuing project or thesis dissertation under him.
Project (Completed/ Ongoing)	1. Gajendra Prasad Singh (PI) received a research Grant of 16.44 lakh from DST-SERC Fast Track Scheme for Young Scientists on 2011 for the project entitle "Synthesis and Characterization of Electromagnetic Wave Absorption Properties of Ferrite based Nanocomposites for High Speed Communication Applications" (Ref. No.:SR/FTP/ETA-28/2011); Duration: 03 years, Status: Completed.
Patent	 Process for High Yeild production of Graphene via detonation of Carbon containing materials, Inventors: Chris Sorensen, Arjun Nepal, Gajendra Prasad Singh, US Patent No.: US 9440857B2, Year 2016.
Articles Published/ Accepted:	 Total Publications (29) Vikash Kumar, Gajendra Prasad Singh, Manish Kumar, Amit Kumar, Pooja Singh, Alok Kumar Ansu, Abhishek Sharma, Tabish Alam, Anil Singh Yadav, Dan Dobrota (2024)Nanocomposite Marvels: Unveiling Breakthroughs in Photocatalytic Water Splitting for Enhanced Hydrogen Evolution, ACS Omega 9(2024) 6147–6164. Vikash Kumar, Benjamin Raj, Parmeshwar Kommu, Sanjeet Kumar Paswan and Gajendra Prasad Singh (2024), Growth of Ni loaded CdS in nanorods structure for photocatalytic and dye degradation applications under solar irradiation, Nano Ex. 5 (2024) 015023. Vikash Kumar, Neha Singh, Soumita Jana, Sanjeeb Kumar Rout, Ratan Kumar Dey, Gajendra Prasad Singh (2020), Surface polar charge induced Ni loaded CdS heterostructure nanorod for efficient photocatalytic hydrogen evolution, International Journal of Hydrogen Energy, 46(2021) 16373-16386. ParameshwarKommu, Gajendra Prasad Singh, CH. Shilpa Chakra, Soumita Jana, Vikash Kumar and A.S Bhattacharyya (2020), Preparation of ZnMn₂O₄ and ZnMn₂O₄/graphene nano composites by combustion synthesis for their electrochemical properties, Materials Science Engineering B 261(2020) 114647-114655.

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5.	Neha Singh, Soumita Jana, Gajendra Prasad Singh and R. K. Dey (2020), <i>Graphene-supported TiO₂: study of promotion of charge carrier in</i> <i>photocatalytic water splitting and methylene blue dye degradation</i> , Advanced Composites and Hybrid Materials, 3 (2020)127–140.
6.	Ayush Pratap, Piyush Kumar, Gajendra Prasad Singh ,Nilrudra Mandal, B K Singh (2020), <i>Effect of Indentation Load on Mechanical Properties and</i> <i>Evaluation of Tribological properties for Zirconia Toughened Alumina</i> , Materials Today: Proceedings, Volume 26, Part 2, 2020, Pages 2442-2446.
7.	DhrubajyotiSadhukhan, and Gajendra Prasad Singh (2020), <i>Study of electrostatic actuated MEMS biaxial scanning micro-mirror with comb structure</i> , AIP Conference Proceedings 2269 (2020), 030019,
8.	ParameshwarKommu, Gajendra Prasad Singh , A.S. Bhattacharyya (2018), Sol gel thermolysis process for the synthesis of nano $ZnMn_2O_4$ by using PVA with combustion fuel and their electrochemical properties, Journal of Energy Storage 16 (2018) 156-159.
9.	Soumita Jana, Neha Singh, Arnab Sankar Bhattacharyya and Gajendra Prasad Singh (2018), <i>Synthesis of Self-Assembled rGO-Co₃O₄ Nanoparticles</i> <i>in Nanorods Structure for Supercapacitor Application</i> , Journal of Materials Engineering and Performance 27(6) (2018) pp. 2741-2746.
10	D. Pankaj Kumar Singh, Arbind Kumar, Sanjay Kumar Sinha, Aman Aggarwal and Gajendra Prasad Singh (2017), <i>Enhancement of surface properties of</i> <i>nanocrystalline TiN coated plasma nitrided AISI 310 austenitic stainless</i> <i>steel</i> ,Int. J. Surface Science and Engineering, 11(6), (2017) 547-562.
1	I. P. S. Das and Gajendra Prasad Singh (2016), <i>Structural, magnetic and dielectric study of Cu substituted NiZn ferrite nanorod</i> , Journal of Magnetism and Magnetic Materials 401 (2016) 918-924.
12	2. Pankaj Kumar Singh, Arbind Kumar, Sanjay Kumar Sinha, Aman Aggarwal and Gajendra Prasad Singh (2016), <i>Improvement in surface properties</i> <i>with TiN thin film coating on plasma nitrided austenitic 316 stainless steel</i> , International Journal of Engineering and Technology (IJET), 8 (2016) 351- 356.
13	3. A. Nepal, G. Chiu, J. Xie, Gajendra Prasad Singh , N. Ploscariu, S. Klankowski, T. Sung, J. Li, B. N. Flanders, K. L. Hohn, C. M. Sorensen (2015), <i>Highly oxidized graphene nanosheets via the oxidization of detonation carbon</i> , Appl. Phys. A: Materials Science & Processing, 120, 543-549.
14	4. Gajendra Prasad Singh, K. M. Shrestha, A. Nepal,K. J. Klabunde, C. M. Sorensen (2014), <i>Graphene supported plasmonic photocatalyst for hydrogen evolution in photocatalytic water splitting</i> , Nanotechnology, 25 (2014) 265701.
15	5. A. Nepal, Gajendra Prasad Singh , B. N. Flanders and C. M. Sorensen (2013), One-step synthesis of graphene via catalyst-free gas-phase

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- 20. **Gajendra Prasad Singh** and S. Ram (2010), *Optical and electron* paramagnetic resonance properties of native Cr_2O_3 surface over CrO_2 , Journal of Magnetism and Magnetic materials 322, 1484.
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- 23. **Gajendra Prasad Singh**, S. Ram and H.-J. Fecht (2008), *Silver modified CrO*² *of core-shell nanoparticles and their magnetic and impedance properties*, Journal of American Ceramic Society, 91, 322.
- 24. Gajendra Prasad Singh and S. Ram (2008), Near stationary dielectric properties in half-metallic ferromagnetic Ag:CrO₂ nanocomposite particles at high frequencies, Modern Physics Letters B, 12,1423.
- 25. **Gajendra Prasad Singh**, B. Biswas, S. Ram and K. Biswas (2008), *Structure and magnetic properties in Ag stabilized ferromagnetic sensors of CrO₂ nanoparticles*, Materials Science & Engineering A, 498, 125.
- 26. **Gajendra Prasad Singh**, J. Alphonsa, P. K. Barhai and S. Mukherjee (2008),*Study of phase formation in selected surface roughened plasma nitrided AISI 304 austenite stainless steel*, Science & Technology of Advance materials, 9, 0250007.
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Books and Book Chapters:	 Total Book (01) Nanofabrication Enrapturing Cues and Prodigal Applications (2024), Editors: Kamal Prasad, Gajendra Prasad Singh, Anal Kant Jha, CRC Press, Taylor & Francis Group, ISBN: 0367537850, 9780367537852. Total Book Chapter (08) P.Kommu, S. Jana, Gajendra Prasad Singh, R. Dash, M. K.Gurjar, A. S. Bhattacharyya (2024),<i>Mixed transition metal oxides for electrochemical energy storage</i>, in Handbook of emerging materials for sustainable energy, Editors: Naveen V. Kulkarni and Boris I. Kharissov, Elsevier,ISBN: 9780323961257, pg129-145. Benjamin Raj, Arun Kumar Padhy, Gajendra Prasad Singh, Ratan Kumar Dey, and Ramesh Oraon(2019),<i>Imidazole framework-based metal oxide nanoparticles photocatalysts: An approach towards amputation of organic pollutants from water</i>in Nano-Materials as Photocatalysts for Degradation of Environmental Pollutants: Challenges and Possibilities, Editors: Pardeep Singh Anwesha Borthakur P.K. Mishra Dhanesh Tiwary, Elsevier,

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	3. Gajendra Prasad Singh , Neha Singh, Ratan Kumar Dey, and Kamal Prasad (2018), <i>Hydrothermal Synthesis of Hybrid Nanoparticles for Future</i> <i>Directions of Renewal Energy Applications</i> , in Exploring the Realms of Nature for Nanosynthesis, Editors: Ram Prasad, Anal Jha, Kamal Prasad, Springer, Nature Switzerland AG 2018, ISBN: 9783319995700 (online) 9783319995694 (print).
	 S. Ram and Gajendra Prasad Singh (2017), Advanced ZrO₂-based ceramic nanocomposites for optical and other engineering applicationsin Composite Materials: Processing, Application, Characterizations, Editors: Kamal K. Kar, Springer-Verlag Berlin Heidelber, ISBN: 978-3-662-49512-4 (Print) 978-3-662-49514-8 (Online)
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	 Gajendra Prasad Singh and ParthaSarathi Das (2015), Synthesis of Cu Substituted Spinel NiZnFe2O4 Nanorod by Polyol Autocombustion in Synthesis and Fabrication of Nanomaterials, Academic Reference Series, Editors: V. Rajendran, P. Paramasivam and K.E. Geckeler, Bloomsbury Publishing India Pvt. Ltd, New Delhi, p-341-344, ISBN: 978-93-85436-76- 5.
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	8. Gajendra Prasad Singh and S. Ram (2006), <i>Synthesis and Electrical transport properties in ferromagnetic Ag:CrO₂ nanoceramics in Advance in Electroceramics Proceeding(NSAE-2006)</i> , Editor: D. K. Kharat, Applied Publisher Pvt. Ltd, p-286-289, ISBN-81-8424-037-6.
Seminar/	International Conference/Workshop
Workshop/ Conference Participation:	 Gajendra Prasad Singh and ParthaSarathi Das, Synthesis of Cu Substituted Spinel NiZnFe2O4 Nanorod by Polyol Autocombustion, International Conference of Nanomaterials and Nanotechnology (NANO-2015) [held during Dec. 07 -10, 2015 at KSR Group of Institutions, Tiruchengode, India]. Neha Singh Bahul Kumar Batan Kumar Dev and Gaiendra Prasad Singh
	"Synthesis of Reduced Graphene-TiO ₂ Photocatalyst for Hydrogen Evolution, International Conference of Nanomaterials and Nanotechnology (NANO-2015) [held during Dec. 07 -10, 2015 at KSR Group of Institutions,

Tiruchengode, India].

- 3. **Gajendra Prasad Singh**, A. Nepal, K. Shrestha, C. Sorensen, Development of efficient graphene based nanocomposites for hydrogen production through Photocatalytic water splitting, International conference on functional materials (ICFM-2014) [held during Feb. 5-7, 2014 at IIT Kharagpur, India]
- 4. **Gajendra Prasad Singh**, and S. Ram, Magnetic and dielectric properties of native Cr₂O₃ surface layer CrO₂ particles, 1st International conference on nanostructured materials and nanocomposites (ICNM-2009) [held during April 6-8, 2009 at Institute of Macromolecular Science and Engineering (IMSE), Kottayam, Kerla, India]
- 5. **Gajendra Prasad Singh**, and S. Ram, One step autoclave synthesis of ferromagnetic CrO₂, International conference on Magnetic Materials and their application for 21st century (MMA-21) [held during Oct. 21-23, 2008 at NPL New Delhi, India], p-159.
- 6. **Gajendra Prasad Singh**and S. Ram, Synthesis and photoluminescence properties in nanostructured Ag@CrO₂ particles, International Conference on Nano and Microelectronics (ICONAME) [held during Jan. 03-05, 2008 at Pondicherry Engineering College, Puducherry, India] P-144.
- 7. **Gajendra Prasad Singh**, J. Alphonsa, P. K. Barhai, S. K. Tiwari, S. Ram, P. A. Rayjada and S. Mukherjee, Improvement in corrosion properties of plasma nitrided austenitic stainless steel by post sputtering, The Sixth Asian-European International Conference on Plasma Surface Engineering (AEPSE 2007) [held during Sept. 24-29, 2007 at Yasuragi-Ioujima Nagasaki, Japan].
- 8. **Gajendra Prasad Singh**, S. Ram and K. Biswas, Structure and magnetic properties in Ag stabilized ferromagnetic sensors of CrO₂ nanoparticles, International Conference on Recent Advancement in Metallurgy and Materials Processing (ICRACM) [held during Feb. 18-21, 2007 at BHU, India] P-47.
- 9. **Gajendra Prasad Singh**, S. Ram and H. J-Fecht, Surface modified CrO₂ as a new series of half-metallic ferromagnetic GMR sensor materials, International Conference on Nanotechnology [held during Aug. 6-8, 2006 at IISC, Bangalore, India] P-129.
- 10. **Gajendra Prasad Singh**, and S. Ram, Photoluminescence and electron paramagnetic resonance in GMR sensor of surface stabilized CrO₂ of granular microstructure, 8th International conference nanostructured materials [held during Aug. 20-25, 2006, IISC, Bangalore, India] P-208.
- 11. **Gajendra Prasad Singh**and S. Ram, Electron paramagnetic resonance in GMR sensor of surface stabilized CrO₂ of granular microstructure, International Conference on Advance Metallurgy and Materials Processing ICAMMP [held during on Feb. 2006 at IIT, Kharagpur, India] P-54.
- 12. **Gajendra Prasad Singh**and S. Ram, Electrical transport properties in Ag:CrO₂nanocermets of a new series of ferromagnetic spintronic, International Conference on MEMS and Semiconductor Nanotechnology

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 13.K. Mohit, S. K. Rout, Gajendra Prasad Singh, and P. K. Barhai, Synthesis and structural characterization of NiZnFerrite nanoparticles, National Seminar on Nanomaterials and their applications (NANOMAT 2011) [held during February 10-11, 2011, at ISM Dhanbad, Jharkhand] p-10. 14. Gajendra Prasad Singh, P. K. Singh, and P. K. Barhai, Study of mechanical properties of plasma nitrided AISI 304 stainless steel, 4th National Workshop on Precision Forming [held during February 21st -22nd, 2011 at Birla Institute of Technology, Mesra, Ranchi, Jharkhand, India], P-13.
15. Gajendra Prasad Singh and S. Ram, Synthesis and morphology of Ag assisted spintronicCrO ₂ nanoparticles, MRSI AGM-2008 on Materials for hostile environments, [held during February 14-16, 2008, at Sree Chitra Tirnul Institute for Medical Science & Technology, Thiruvananthapuram, India] p-216.
16. Gajendra Prasad Singh, S.K. Mishra and S. Ram, A new series of spintronics of Ag:CrO ₂ magnetic semiconductors, Indo-Singapore symposium on advance functional materials, [held during February 24-25, 2006, at Indian Institute of Technology, Bombay, India] MM – 39.
17. Gajendra Prasad Singh and S. Ram, Synthesis and electrical transport properties in ferromagnetic Ag:CrO ₂ nanocermates, National seminars on advance in electroceramics [held during May 5-6, 2006 at DRDO Centre for piezoceramics & devices, armament research & development establishment, Pune, India] P – 286.
18. Gajendra Prasad Singh , S. Biswas and S. Ram, New GMR materials of CrO ₂ - basedhalf-metallic ferromagnetic nanoceramics and derived nanocomposite, National Conference on advances in electronic materials and devices [held during March 5,6, 2006, Department of Physics, Bilaspur University, Bilaspur, India] P-30.
19.S. Ram, S. Biswas and Gajendra Prasad Singh, Chemical synthesis of novel sensor materials of Ag coated magnetic particles of self-controlled core- shell nanostructure, A theme meeting sponsored by BRNS on Nanostructured coating for tribological and sensor applications [held during March 25 - 26, 2006, IIT extension centre, Kolkata] P – 50.
20.S. Ram, S. Biswas and Gajendra Prasad Singh , Measurements of magnetic, GMR and EPR properties in CrO ₂ and Ag coated CrO ₂ of a new series of spintronics materials, National workshop on Measurements and characterization of magnetic materials [held during April 20 - 21, 2006 at Saha Institute of Nuclear Physics, Kolkata, India] P – 7.
21. Gajendra Prasad Singh , J. Alphonsa, P. K. Barhai and S.Mukherjee, Plasma Nitriding of AISI 304 Steel, Plasma Surface Engineering Workshop [held during Sept. 2004, at BARC, Mumbai, India] P-283.

Program Organized:	 AICTE Training And Learning (ATAL)-FDP on "3D Printing and Design" from February 03rd-07th, 2020 Organizing of DST, DAE, and CSIR sponsored National Conference cum Workshop on "Recent Developments in Engineering Materials" from May 12th- 14th, 2011. Organizing of DST sponsored "One Day Workshop on Plasma Nitriding" on 20thAugust 2010.
Any other information:	 Life Membership (LM 760) of Plasma Science Society of India Life Membership (LM 717) of Magnetic Society of India
Updated as on	08 th April 2024