Curriculum Vitae

Name and Affiliation
Gour Gopal Roy
Professor & former HOD, Department of Metallurgical & Materials Engineering
Indian Institute of Technology Kharagpur
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Educational Qualification

Ph. D., Materials & Metallurgical Engineering, Indian Institute of Technology, Kanpur, 1996.

M.Tech., Materials & Metallurgical Engineering, Indian Institute of Technology, Kanpur, 1990.

B.Tech., Metallurgical Engineering, Jadavpur University, Kolkata, 1988.

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Professional Experience

From 2018 to today	Professor (HAG), Metallurgical & Materials Engineering
2014- March, 2017	Professor & HOD, Metallurgical & Materials Engineering, IIT Kharagpur
2009 onwards	Professor, Metallurgical & Materials Engineering, IIT Kharagpur
2004-2008	Associate Professor, Dept. of Metallurgical & Materials Engineering, I.I.T. Kharagpur
1998- 2004	Assistant Professor, Dept. of Metallurgical & Materials Engineering, I.I.T. Kharagpur
1997-1998	Visiting Lecturer, I.I.T. Kharagpur
1997-1998	Scientist, TRDDC, Pune

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International collaboration

- Visited several times at Pennsylvania State University, USA, to interact with Prof. DebRoy and his research group under the capacity of post-doctoral fellow/visiting scholar during the period 2001-2009. The author was the prime architect in developing a three-dimensional framework of fusion welding code. The code was further extended and applied to arc welding, electron beam welding, pulsed laser welding, friction stir welding.

- Present collaboration with Warwick Manufacturing Group, University of Warwick, UK on clean steel development and weldability of materials.

Specialization and Expertise: Alternative Routes of Ironmaking, Clean steel, Modelling & Simulation, Electron beam Welding.

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Awards and Distinctions

- *Metallurgist of the Year-2015* - Instituted by Ministry of Steel, Govt. of India, presented during NMD ATM-2015 organized by Indian Institute of Metals, Coimbatore, 14-16th November, 2015.
- *One of the Editors* of the Transactions of the Indian Institute of Metals, Springer, from 2021
- *Member of the Editorial Board* of the International Journal "Science & Technology of Welding & Joining", published by Maney Publishing on behalf of the Institute of Materials, Minerals and Mining, UK in association with the Japan Welding Society, from 2010.
- *SAIL Gold Medal*, 2005-Best paper in *Transactions of IIM*, for the paper on *Modelling Cored Wire Injection in Steel Melts by* Sarbendu Sanyal, Sanjay Chandra, Amreekh Singh and G. G. Roy

- *Featured in world ranking of scientists* up to a threshold number as research publications output in the year 2019 in the article, titled "Updated science-wide author databases of standardized citation indicators", published in the journal of PLOS Biology by a famous analyst group of Stanford University. *Out of 67 faculty members featured in the list from IIT Kharagpur, the author has featured as sole candidate in the subject category Mining and Metallurgy*. (https://kgpchronicle.iitkgp.ac.in/iit-kharagpur-researchers-feature-among-worlds-top-2/)

- *Invited article in business Journal*: Gour Gopal Roy: Magic of Ironmaking, *Engineering Export Promotion Council (EEPC) Journal*, September Issue, 2020.

- The author *developed a Swayam-NPTEL online Certification Course (12 weeks)* on "Ironmaking & Steelmaking". The course was first run during July-October session 2020.

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Summary of research output (papers, guidance, sponsored projects, citation):

- 107 Journal papers, 34 conference proceeding
- Total citation: 3570; H-index: 27; i-10 index: 52
- PhD guidance: 16 (completed), 8 (ongoing)
- Completed Sponsored projects: Rs. 150 lakhs (CSIR/MHRD/DST/BRNS)

- Ongoing Sponsored projects:

  i) 741 lakhs (Uchchatar Avishkar Yojana Project under Pradhan Mantri Yojana Scheme) on Development of Rotary Hearth Furnace Technology for Treating Off Grade Iron Ore Fines of Indian Origin Including Magnetite Ore in collaboration with ASP, Durgapur, SAIL. 16-11-16 to 30-09-2023

  ii) 300 lakhs (a satellite project for CoE in Advanced Manufacturing, IIT Kharagpur, sponsored by DHI) on Non Metallic Inclusions (NMI) and its Control, New Steel Products through Energy Efficient EAF at HEC (NTE) in collaboration with HEC, Ranchi. 1-2-2018 to 31-8-2023

  iii) 31 lakhs (IREL LTD) on Exploring the potential of rare earth elements (REE) as inclusion modifier towards the production of inclusion-critical special-grade low carbon micro-alloyed steel. 15-11-2022 to 14-11-2024

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Teaching Record

UG	Theory	Iron Making, Steel Making, Computer Application in Metallurgy, Transport Phenomena
	Lab.	Metallography, Thermodynamics
PG	Theory	Computer Programming and Numerical methods in Materials Engineering, Process modeling
	Lab.	Computer Programming and Numerical Methods

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Complete List of Journal Publications:

Journal (107)

1. Banty Kumar, Gour Gopal Roy: Reduction Behaviour of Electric Arc Furnace Dust (EAFD)-Coal Composite Pellet in a Muffle Furnace, J. Inst. Eng. India, Ser. D, 1-9. Doi: 10/1007/s40033-023-00488-5
2. Singh, Vasundhara and Srirangam, Prakash and Roy, Gour Gopal: Effect of Beam Oscillation on Microstructure and Mechanical Properties of Electron Beam Welded EN25 Steel, *Materials*, 16(7), 2717 (2023).
3. Singh, Vasundhara and Srirangam, Prakash and Chakrabarti, Debalay and Roy, Gour Gopal: Hot Deformation Behavior of EN30B Forged Steels in the Presence of Non-metallic Inclusions, *Journal of Materials Engineering and Performance*, 1-13(2023).
4. Prakash, PS Lin and Panda, Sushanta Kumar and Roy, Gour Gopal: Deep drawability of electron beam welded tailored blanks of commercially pure titanium thin sheets, *Proceedings*

of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications, online, (2023)

5. Singh, Jeetendra Kumar and Roy, Gour Gopal and Majumdar, Jyotsna Dutta: Effect of Beam Oscillation on Microstructure and Tensile Property of Electron Beam-Welded Commercially Pure (CP) Titanium, Transactions of the Indian Institute of Metals, 1-8(2022)
6. Singh, Jeetendra Kumar and Roy, Gour Gopal and Prakash, PN and Rai, Abhishek and Manna, I and Kanjilal, D and Dutta Majumdar, Jyotsna: Effect of beam oscillation on microstructure, defect density, and resistivity of electron beam welded niobium, Welding in the world,66(12), 2483-2495 (2022).
7. Das, D., Dinda, S.K., Das, A.K., Pratihar D. K., Roy G. G.: Study of micro-porosity in electron beam butt welding. *Int J Adv Manuf Technol* 121, 4583–4600 (2022). https://doi.org/10.1007/s00170-022-09359-x
8. Sen, P.K., Roy, G.G: Review Article - Climate Change and Emission Reduction Pathways for a Large Capacity Coal-Based Steel Sector, Implementation Issues. *Trans Indian Inst Met* (2022). https://doi.org/10.1007/s12666-022-02622-5
9. Kamaraj, A., Murugaiyan, P., Mandal, G.K., Roy G. G.: The Role of Slag Carryover on the Non-metallic Inclusion Evolution and Magnetic Behavior in Electrical Steel. *Metall Mater Trans B* 53, 1989–2003 (2022). https://doi.org/10.1007/s11663-022-02547-w
10. Ashok Kamraj, Gopi K. Mandal, Sethu P. Shanmugam, and Gour G. Roy: Quantification and analysis of slag carry over during liquid steel tapping from BOF vessel, *Canadian Metallurgical Quarterly* (2022). doi: 10.1080./00084433.2022.2044688
11. P.S. Lin Prakash, Rahul Rakshit, Sumantra Mandal, Gour Gopal Roy, Sushanta Kumar Panda: Uniaxial tensile deformation behaviour of electron beam welded commercially pure titanium and Ti6Al4V joints: Experimental and metallurgical characterization, *Journal of Manufacturing Processes*, 76, ,444-456, (2022), https://doi.org/10.1016/j.jmapro.2022.02.034.
12. Debasish Das, Dilip Kumar Pratihar, Gour Gopal Roy: Modeling of beam divergence, *Optik*, 256 (2022), https://doi.org/10.1016/j.ijleo.2022.168747.
13. Kiran Kumar, T., Roy, G.G: A Review on Processing of Electric Arc Furnace Dust (EAFD) by Pyro-Metallurgical Processes. *Trans Indian Inst Met*, 75, 1101–1112 (2022). https://doi.org/10.1007/s12666-021-02465-6
14. Debasish Das, Kalinga Simant Bal, Dilip Kumar Pratihar, Gour Gopal Roy: Correlating the weld bead's 'macro-,micro-features' with the weld pool's 'Fluid Flow' for electron beam welded SS201 plates, *International Journal of Mechanical Science*, 210 (2021) https://doi.org/10.1016/j.ijmecsci.2021.106734, https://doi.org/10.1016/j.ijmecsci.2021.106734.
15. Lord Jaykrishan Nayak and Gour Gopal Roy: Role of beam oscillation on electron beam welded zircaloy-4 butt joints, Science and Technology of Welding and joining, 26(6), 478-486 (2021).
16. Debasish Das, Sanjib Jaypuria, Dilip Kumar Pratihar, and Gour Gopal Roy: Weld Optimization, Science & Technology of Welding & Joining, 26(3), 181-195 (2021).
17. Soumitra Kumar Dinda, Debasish Das, Anand Mohan, Prakash Srirangam and Gour Gopal Roy: Effect of beam oscillation on electron beam butt welded dual-phase (DP600) steel to 5754 aluminum alloy joints, Metallurgical & Materials Transaction A, 52, 1723-1731 (2021). https://doi.org/10.1007/s11661-021-06181-0
18. Das, Debasish, Pratihar, Dilip Kumar, Roy, Gour Gopal:Establishing a Correlation Between Residual Stress and Natural Frequency of Vibration for Electron Beam Butt Weld of AISI 304 Stainless Steel, Arabian Journal for Science and Engineering,45(7),5769-5781(2020).

19. Saleem, Sooraj, Roy, Gour Gopal: Influence of burner nozzle configuration, and inlet gas composition on combustion, gas dynamics, temperature and concentration profile in a rotary hearth furnace, Ironmaking & Steelmaking, 48(3), 229-241(2021).
20. Dinda, Soumitra Kumar, Kockelmann, Winfried, Roy, Gour Gopal, Srirangam, Prakash:Neutron diffraction bulk texture study with impact property correlation of electron beam welded dissimilar Fe-7% Al alloy to steel joints, The International Journal of Advanced Manufacturing Technology,108,1499-1508 (2020).
21. Dinda, Soumitra Kumar, Kar, Jyotirmaya, Roy, Gour Gopal, Kockelmann, Winfried, Srirangam, Prakash:Texture mapping in electron beam welded dissimilar copper-stainless steel joints by neutron diffraction,Vacuum,108, 1499–1508 (2020).
22. Nayak, Lord Jaykishan, Roy, Gour Gopal: Joining of zircaloy-4 of dissimilar thickness using electron beam welding, International Journal of Advanced Manufacturing Technology, 110(9),2323-2340 (2020).
23. Singh, Vasundhara, Bandi, Bharath, Roy, Gour G, Srirangam, Prakash: Effect of non-metallic inclusions (NMI) on crack formation in forged steel, Materials Today: Proceedings, Elsevier, 41, 1096-1102 (2021).
24. Saleem, Sooraj, Roy, Gour Gopal: Effect of Oxygen Enrichment on Flow Field, Temperature, and Gas Concentration Profile Inside a Pilot-Scale Rotary Hearth Furnace, Metallurgical and Materials Transactions B, 51(6),2735-2755 (2020).
25. Kumar, Binay, Roy, Gour Gopal, Sen, Prodip Kumar: Comparative exergy analysis between rotary hearth furnace-electric arc furnace and blast furnace-basic oxygen furnace steelmaking routes, *Energy and Climate Change*,1,100016,(2020). https://doi.org/10.1016/j.egycc.2020.100016
26. Nayak, L.J., Roy, G.G. Effect of heat input on microstructure, mechanical and corrosion properties of electron beam welded zircaloy-4 sheets. *Weld World* 65, 987–1005 (2021). https://doi.org/10.1007/s40194-021-01071-w
27. Kumar, Binay, Roy, Gour Gopal, Sen, Prodip Kumar: Exergy and CO2 emission analysis of rotary hearth furnace-electric arc furnace routes of steelmaking, International Journal of Exergy, 36, 280 – 297 (2021).
28. Srinibash Mishra, Shailesh Priyadarshi, and Gour Gopal Roy: Effect of Temperature and Carbon Content on the Performance Parameters of Iron Ore-Coal Composite Pellet, *MGMI Transactions*, 116, 21-29 (2020).
29. S Saleem, S Mishra, and G. G. Roy: A simulation study of reduction kinetics for sponge iron production in a rotary hearth furnace, Canadian Metallurgical Quarterly, 59(2), 180-188 (2020).
30. Soumyadeep Dasgupta, Sooraj Saleem, Prakash Srirangam, Michael Auinger, and Gour G. Roy: A Computational Study on the Reduction Behavior of Iron Ore/Carbon Composite Pellets in Both Single and Multi-layer Bed Rotary Hearth Furnace, *Metallurgical and Materials Transactions B*, 51(2), 818-826 (2020). https://doi.org/10.1007/s11663-020-01778-z.
31. Lord Jaykishan Nayak, Gour Gopal Roy: Thermocouple temperature measurement during high speed electron beam welding of SS 304,*Optik (*2019). https://doi.org/10.1016/j.ijleo.2019.16353
32. Debasish Das, Dilip Kumar Pratihar,Gour Gopal Roy: Effects of space charge on weld geometry and cooling rate during electron beam welding of stainless steel, *Optik (*2019). https://doi.org/10.1016/j.ijleo.2019.163722
33. Debasish Das, Dilip Kumar Pratihar and Gour Gopal Roy: Cooling rate predictions and its correlation with grain characteristics during electron beam welding of stainless steel, *The*

International Journal of Advanced Manufacturing Technology (2018). (https://doi.org/10.1007/s00170-018-2095-6)

34. Debasish Das, Abhishek Rudra Pal, Amit Kumar Das, Dilip Kumar Pratihar, Gour Gopal Roy: Nature-Inspired Optimization Algorithm-Tuned Feed-Forward and Recurrent Neural Networks Using CFD-Based Phenomenological Model-Generated Data to Model the EBW Process, *Arabian Journal for Science and Engineering* (2019). https://doi.org/10.1007/s13369-019-04142-9
35. Manisha Sahoo, Sidhartha Sarkar, Ajoy C. R. Das, Gour Gopal Roy, Prodip Kumar Sen: Role of Scrap Recycling for CO2 Emission in Steel Plant: A Model based Approach, *Steel Research International* (2019). https://doi.org/10.1002/srin.201900034
36. Madan Mohanasundaram, Gour Gopal Roy, Swatantra Prakash: Thermodynamic Modelling for Design of Synthetic Slag for Inclusion Removal, *Trans Indian Inst. Met*. (2019). https://doi.org/10.1007/s12666-019-01585-4
37. Jyotirmaya Kar, Debalay Chakrabarti, Sanat Kumar Roy, Gour Gopal Roy: Beam oscillation, porosity formation and fatigue properties of electron beam welded Ti-6Al-4V alloy, *Journal of Materials Processing Technology* 266,165-172 (2019).
38. Soumitra Kumar Dinda, Subhodeep Jana, Gour Gopal Roy, Prakash Srirangam: Effect of beam oscillation on porosity and intermetallics of electron beam welded DP600-steel to Al 5754-alloy, *Journal of Materials Processing Technology*, 265, 191-200 (2019).
39. Bharath Bandi, Soumitra Kumar Dinda, Jyotirmaya Kar, Gour Gopal Roy, Prakash Srirangam: Effect of weld parameters on porosity formation in electron beam welded Zircaloy-4 joints: X-ray tomography study, *Vacuum*, 158, 172-179 (2018).
40. Ashok Kamaraj, GK Mandal, GG Roy:Control of Slag Carryover from the BOF Vessel During Tapping: BOF Cold Model Studies, *Metallurgical and Materials Transactions B*, 50 (1), 438-458 (2019). https://doi.org/10.1007/s11663-018-1432-3
41. PS Lin Prakash, Sunil Kumar Biswal, Gour Gopal Roy, Maha Nand Jha, Martin Mascarenhas, Sushanta Kumar Panda:Effect of Orientation of Weld Line on Formability of Electron Beam-Welded Dissimilar Thickness Titanium Sheets, *Journal of Materials Engineering and Performance*, 27(11), 5913-5925 (2018). https://doi.org/10.1007/s1166
42. Debasish Das, Dilip Kumar Pratihar, Gour Gopal Roy, Abhishek Rudra Pal:Phenomenological model-based study on electron beam welding process, and input-output modeling using neural networks trained by back-propagation algorithm, genetic algorithms ,*Applied Intelligence*, 48(9), 2698-2718 (2018).
43. Anubhav Singh, Shamik Basak, Lin Prakash PS, Gour Gopal Roy, Maha Nand Jha, Martin Mascarenhas, Sushanta Kumar Panda: Prediction of earing defect and deep drawing behavior of commercially pure titanium sheets using CPB06 anisotropy yield theory, *Journal of Manufacturing Processes*, 33, 256-267 (2018).
44. Jyotirmaya Kar, Soumitra Kumar Dinda, Gour Gopal Roy, Sanat Kumar Roy, Prakash Srirangam: X-ray tomography study on porosity in electron beam welded dissimilar copper–304SS joints, *Vacuum*, 149, 200-206 (2018).
45. Jyotirmaya Kar, Sanat Kumar Roy, Gour Gopal Roy: Influence of beam oscillation in electron beam welding of Ti-6AL-4V, *International Journal of Advanced Manufacturing Technology*, 94, 4531-4541 (2018).
46. Veerababu Gollapalli, M. B. Venkata Rao, Phani S. Karamched, Chenna Rao Borra, Gour G. Roy & Prakash Srirangam: Modification of oxide inclusions in calcium-treated Al-killed

high sulphur steels, *Ironmaking & Steelmaking* (2018). https://doi.org/10.1080/03019233.2018.1443382

47. S. Mishra and G. G. Roy: Effect of CaO on the reduction behaviour of iron ore-coal composite pellets in multi-layer bed rotary hearth furnace, *Ironmaking and Steelmaking*, 45(5), 426-433 (2018). https://doi.org/10.1080/03019233.2016.1278515.
48. S Sarkar, R Bhattacharya, GG Roy, PK Sen: Modeling MIDREX Based Process Configurations for Energy and Emission Analysis, *Steel Research International*, 87 (2017). https://doi.org/10.1002/srin.20170024889
49. B Kumar, S Mishra, MBV Rao, GG Roy : Experimental investigation of recovery and efficiency of calcium addition through cored wire in steel melt at Visakhapatnam Steel Plant, *Ironmaking & Steelmaking* (2017). https://doi.org/ 10.1080/03019233.2017.1405147
50. B Kumar, S Mishra, GG Roy, PK Sen:Estimation of Carbon Dioxide Emissions in Rotary Hearth Furnace Using a Thermodynamic Model, *Steel Research International*. (2017). https://doi.org/10.1002/srin.201600265
51. Ashok Kamaraj, Sheuli Hore, P. Sathyamoorthi, Gour G. Roy,Gopi K. Mandal:: Estimation and Analysis of Excess Oxygen Input into Ladle During Liquid Steel Tapping, *Trans Indian Inst. Met.*, 70(9), 2465–2476 (2017). https://doi.org/10.1007/s12666-017-1108-8
52. P. C. Beuria, S. K. Biswal, B. K. Mishra, G. G. Roy: Study on kinetics of thermal decomposition of low LOI goethetichematite iron ore, *International Journal of Mining Science and Technology* (2017). http:// doi.org/10.1016/j.ijmst.2017.06.018
53. Bharat Khurana, Stephen Spooner, M. B. V. Rao, Gour Gopal Roy and Prakash Srirangam: In situ Observation of Calcium Oxide Treatment of Inclusions in Molten Steel by Confocal Microscopy, *Metallurgical and Materials Transactions B* , 48(3), 1409-1415 (2017).
54. P.C. Beuria, S.K. Biswal, B.K. Mishra1, and G.G. Roy, Kinetics of thermal decomposition of hydrated minerals associated withhematite ore in a fluidized bed reactor, *International Journal of Minerals, Metallurgy and Materials*, 24(3), 229-239 (2017)
55. S. Mishra and G. G. Roy: *Reduction Behaviour of Iron Ore-Coal Composite Pellets in Rotary Hearth Furnace (RHF): Effect of Pellet Shape, Size, and Bed Packing Material, Trans Indian Inst. Met.*, 70(4), 967-978 (2017).
56. Jyotirmaya Kar, Sanat Kumar Roy, and Gour Gopal Roy: Effect of Beam Oscillation on Microstructure and Mechanical Properties of AISI 316L Electron Beam Welds, *Metall. Mat. Trans. A*, Vol. 48A, 1759-1770 (2017)
57. Binay Kumar, Srinibash Mishra, Gour Gopal Roy, and Prodip Kumar Sen: Estimation of Carbon Dioxide Emissions in Rotary Hearth Furnace Using a Thermodynamic Model, *Steel Research Int.*, 88 (5) (2017). http:// doi.org/10.1002/srin.201600265
58. Soumitra Kumar Dinda, Md. Basiruddin S K, Gour Gopal Roy, Prakash Srirangam: Microstructure and mechanical properties of electron beam welded dissimilar steel to Fe–Al alloy joints, *Materials Science & Engineering A*, 677, 182–192 (2016).
59. P. C. Beuria, S. K. Biswal, B. K. Mishra, G. G. Roy: Kinetics study on removal of LOI by thermal decomposition of hydrated minerals associated in hematite ore, *J Therm Anal Calorim*, 126,1231–1241 (2016).
60. S. Mishra and G. G. Roy: *Effect of Amount of Carbon on the Reduction Efficiency of Iron Ore-Coal Composite Pellets in Multi-layer Bed Rotary Hearth Furnace (RHF), Metall. Mat. Trans. B*, 47B, 2347-2356 (2016).

61. Jyotirmaya Kar, Sanat Kumar Roy, Gour Gopal Roy: Effect of beam oscillation on electron beam welding of copper with aisi-304 stainless steel, *Journal of Materials Processing Technology*, 233, 174–185 (2016).
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63. Soumitra Kumar Dinda, Jason M. Warnett, Mark A.Williams, Gour Gopal Roy, Prakash Srirangam, 3D imaging and quantification of porosity in electron beam welded dissimilar steel to Fe-Al alloy joints by X-ray tomography, *Materials & Design*, 96, 224–231 (2016).
64. S. C. Khattoi, G. G. Roy: Reduction Efficiency of iron ore-coal composite pellets in tunnel kiln for sponge iron production, *Trans. Indian Inst. Met.*, 68(5), 683-692 (2015).
65. P. Sen , C. Biswas , P. Das and G. G. Roy: Optimisation of coal rate and carbon dioxide emissions in Corex process,Mineral Processing and Extractive Metallurgy, *Trans. Inst. Min Metall. C*, 124(3), 175-183 (2015)
66. Jyotirmaya Kar, Sankhya Mahanty, Sanat K. Roy, G. G. Roy: Estimation of Average Spot Diameter and Bead Penetration Using Process Model During electron Beam Welding of AISI 304 Stainless Steel, *Trans Indian Inst. Met.*, 68(5), 935-941 (2015).
67. Vandana Kumari, G. G. Roy, and P. K. Sen: Mathematical Model to Estimate the Rate Parameters and Thermal Efficiency for the Reduction of Iron Ore–Coal Composite Pellets in Multi-layer Bed at Rotary Hearth Furnace, *Trans. Indian Inst. Met.*, 68(1), 109-116 (2015).
68. H.C. Dey, S.K. Albert, A.K. Bhaduri, G.G. Roy, R. Balakrishnan: Effect of Post Weld Heat Treatment (PWHT)Time and Multiple PWHT on Mechanical Properties of Multi-Pass TIG Weld Joints of Modified 9Cr-1Mo Steel, *Welding in the World*, 58, 389-395 (2014).
69. Sekhar Suman, Brijesh K. Giri, Gour G. Roy: Mathematical Modeling of Iron Ore Sintering process using genetic algorithm: Effect of Moisture Evaporation and Condensation on the Temperature Profile, *Computer Methods in Materials Science*, Poland, 13(1), 141-146 (2013).
70. Mukesh Kumar Sharma, Vikas Solanki, G. G. Roy and P. K. Sen: Study of Reduction Behavior of Prefabricated Iron Ore–Graphite/Coal Composite Pellets in Rotary Hearth Furnace, *Ironmaking and Steelmaking*, UK, 40(8), 590-597 (2013).
71. S. Mohanty, C. K. Laldas, and G. G. Roy: A New Model for Keyhole Mode Laser Welding using FLUENT, *Trans. IIM*, 65(5), 2012, 459-466 using FLUENT, *Trans. Indian Inst. Meta.*, 65(5), 459-466 (2012).
72. B. K. Giri and G. G. Roy: Mathematical Modelling of Iron Ore Sintering Process usingGenetic Algorithm, *Ironmaking & Steelmaking*, 39(1), 39(1), 59-66 (2012).
73. G. M. Chowdhury, C. S. Murmu, S. K. Roy, and G. G. Roy: Some Studies to Establish the Reaction Mechanism for the Reduction of Iron Ore-Graphite Composite Pellets in a Packed Bed Reactor, *Steel Research Int.*, 81(11), 925-931 (2010).
74. Arora, G. G. Roy and T. DebRoy: Cooling rate in 800 to 500ºC range from dimensional analysis, *Science and Technology for Welding &Joining*, 15(5), 423-427 (2010).
75. S. Basak, R. Kumar Dhal, and G. G. Roy: Efficacy and recovery of calcium during CaSi cored wire injection in steel melts, *Ironmaking & Steelmaking*, 37(3), 161-168 (2010).
76. Z. A. Taha, G. G. Roy, K. I. Hajim, I. Manna: Mathematical modeling of laser assisted transmission lap welding of polymers, *Scripta Materialia,* 60, 663-666 (2009).
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78. Golap Md. Chowdhury, Gour G. Roy: Application of genetic Algorithm (GA) to estimate the rate parameters for solid state reduction of iron ore in presence of graphite, *Computational Materials Science*, 45, 176-180 (2009).
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81. R. Rai, G. G. Roy, and T. DebRoy: A computationally efficient model of convective heat transfer and solidification characteristics during keyhole mode laser welding, *Journal of applied Physics,* 101 (2007). https://doi.org/10.1063/1.2537587
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Conference Procedings (29)

1. Dinda, Soumitra Kumar, Srirangam, Prakash, Roy, Gour Gopal:Defects Comparison Between Single and Double-Sided Electron Beam Welded Dissimilar DP600 Steel to 5754 Al Alloy Joints: X-Ray Tomography Study, TMS 2020 149th Annual Meeting & Exhibition Supplemental Proceedings,1107-1116,2020, Springer
2. Das, Debasish, Das, Amit Kr, Pratihar, DK, Roy, GG: Prediction of residual stress in electron beam welding of stainless steel from process parameters and natural frequency of vibrations using machine-learning algorithms, Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science,2020, SAGE Publications Sage UK: London, England

3. Binay Kumar & G. G. Roy: Calcium cored wire injection for stable casting: An insight into fundamentals and economics: Proceedings of ISIJ Meeting, Yokoyama, Japan, 9-13th September, 2019
4. G. G. Roy, Srinibash Mishra, Sooraj S.: Sponge iron production in rotary hearth furnace: investigation towards multi-layer bed, *Science & Technology of Iron and Steel (STIS-2017)*, IIT Kanpur, 10-14 December, 2017.
5. Sooraj Saleem, Srinibash Mishra and Gour Gopal Roy: Mathematical model for non-isothermal reduction of iron-ore coal composite pellets in multi-layer bed Rotary Hearth Furnace, *Science & Technology of Iron and Steel (STIS-2017)*, IIT Kanpur, 10-14 December, 2017
6. Dey, H.C., Vanaja, J., Laha, K., Bhaduri, A.K., Albert, S.K., & Roy, G.G: Comparison of creep rupture behavior of tungsten inert gas and electron beam welded grade 91 steel, *International conference on creep, fatigue and creep-fatigue interaction*, Kalpakkam (India), 19-22 Jan 2016
7. Jord jaykrishan nayak, G. G. Roy: Thermocouple temperature measurement during highspeed electron beam welding of SS 304, *National welding society annual meet-2016*, Science City, Kolkata, December, 2016
8. Jyotirmaya Kar, S. K. Roy and G. G. Roy: Effect of beam oscillation on mechanical and corrosion properties of aisi 316l electron beam welds, *National welding society annual meet-2016*, Science City, Kolkata, December, 2016
9. Soumitra Kar, Prakash Srirangam, and G. G. Roy: Defects quantification of electron beam welded dissimilar steel to fe-al alloy joints by x-ray tomography, *National welding society annual meet-2016*, Science City, Kolkata, December, 2016
10. Jyotirmaya Kar and G. G. Roy: Effect of beam oscillation on electron beam welded dissimilar joints, *National welding society annual meet-2016*, Science City, Kolkata, December, 2016
11. Abhinav Gupta, Rachna Tripathi, Srinibhas Mishra and G. G. Roy: Non-Isothermal Model to Estimate the Rate Parameters and Thermal Efficiency for the Reduction of Iron Ore–Coal Composite Pellets in Multi-Layer Bed at Rotary Hearth Furnace, *Asia Steel Conference-2015*, Yokohama, Japan, 5th to 10th October, 2015
12. Jyotirmaya Kar, G. G. Roy, and S. K. Roy: Effect of beam oscillation on the electron beam welding of copper to AISI-304 stainless steel, *International Conference on Structural Integrity (ICONS-2014)*, Kalpakkam, India, February 4-7, 2014
13. G. G. Roy: Modeling and simulation of submerged injection of calcium powder in steel melt, IIM Metal News, 17(1), 2014, 18-21 (Based on presentation made in *NMD ATM, 2014*).
14. H.C. Dey, Alpesh Patel, A.K. Bhaduri,Shiju Sam, S.K. Albert, G.G. Roy: Studies on the Microstructure and Toughness of Simulated Heat Affected Zone in a Modified 9Cr-1Mo Steel, *67th Annual Assembly & International Conference of International Institute of Welding*, Seoul, Korea, 13-18 July, 2014.
15. H.C. Dey, Jyotirmay Kar, G.G. Roy S.K. Albert, A.K. Bhaduri: Mechanical Properties and Microstructure Characterization of Electron Beam Weld Joint of Modified 9Cr-1Mo Steel, *International Institute of Welding –International Welding Congress 2014 (IC 2014)*, April 9-11, 2014, New Delhi.
16. H.C. Dey, S.K. Albert, A.K. Bhaduri, G.G. Roy and R. Balakrishnan: Effect of Post Weld Heat Treatment (PWHT) Time and Multiple PWHT on Mechanical Properties of Modified 9Cr-1Mo steel, *66th Annual Assembly & International Conference of International Institute of Welding*, Essen, 11-17 September, 2013

17. Vandana Kumari, and P. K. Sen, G. G. Roy: Mathematical model to estimate thermal efficiency for the reduction of iron ore–coal composite pellets in multi-layer bed at rotary hearth furnace, *STIS-2013*, Jamshedpur, December, 2013
18. Rajeev Kumar Sahu, G. G. Roy,P. K. Sen: Use of process models to estimate co_2 emission reduction for top gas recycle furnace with Indian raw materials, *STIS-2013*, Jamshedpur, December, 2013
19. H. C. Dey, S. K. Albert, A. K. Bhaduri, G. G. Roy, P. Sivaraman: Study on residual stresses and distortions during carbon steel welding, *International Welding Congress*, 25-26 February, 2010, Bangkok, Thailand
20. Abhilash Agnihotri and Gour Gopal Roy: Mathematical Model for Prediction on Carbon Block Wear Profile in the Hearth of Blast Furnace at JSPL, Raigarh, *IIM Metal News*, 13(6), Dec., 2010, 17-21 (based on presentation at *NMD, ATM, 2010*)
21. T. DebRoy, A. Arora, G. G. Roy and A. De, Advances and Promises of Weld Pool Convective Heat Transfer Calculations, *9th International Seminar on Numerical Analysis of Weldability*, Graz-Seggau , Austria , September, 2009.
22. Application of Genetic Algorithm (GA) to estimate the rate parameters for reduction of iron ore-graphite composite pellets in a packed bed reactor, *European Materials Research Society (EMRS) conference*, 21-24th September, Poland, 2007
23. Mathematical Modeling of Fusion Welding: Temperature Profile, Solidification Characteristics, *WPQ-2007*, NMRL, Ambarnath, Mumbai, February, 2007
24. Sarbendu Sanyal, Sanjay Chandra, R. K. Pandey, P. K. Sinha and G. G. Roy: Development of Norms for Cored Wire Injection in Steel Melts, *2nd International Conference on Process Development in Iron and Steelmaking, SCANMET – II*, Lulea, Sweden, 2004.
25. S. K. Sahoo, and G. G. Roy: Mathematical modeling of fluid flow and heat transfer during fusion welding: some case studies, *Weld-Tech-2003*, IIT Kharagpur, March 14-15, 2003
26. Satadal Ghorai, G. G. Roy, and S. K. Roy: Simulation of secondary refining of steel by powder injection through physical modeling, *Asia Steel – 2003*, Tatasteel, Jamshedpur, April 14-16, 2003
27. G. G. Roy, W. Zhang, and T. DebRoy: Mathematical Modeling of Transient Fluid Flow and Heat Transfer during Gas Tungsten Arc Spot Welding, *National Seminar on Weld Integrity*, Dec. 5-7, 2003, p.42
28. N. Chakraborti, K. Suresh Kumar and G. G. Roy: A Heat Transfer Study of the Continuous Caster Mold using Finite Volume Approach coupled with Genetic Algorithm, Int. Conf. adv. Mater. Mater. Proce., 2002, p. 614
29. T. DebRoy, H. Zhao, W. Zhang and G. G. Roy: *6th Int. Seminar on Numerical Analysis of weldability*, Graz-Saggau, Austria, 1-3 Oct., 2001.

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Invited Lectures (34):

i. Sponge iron production in rotary hearth furnace (RHF) using biochar: a sustainable route of ironmaking, Invited lecture, Dissemination Workshop on Accelerating Decarbonisation for India's Steel Sector at Bhubaneshar, 24th May, 2023.

ii. CFD study of Rotary Hearth Furnace for sponge iron production at Indian Institute of technology Kanpur, India (18-12-2022 to 19-12-2022), Type: Keynote Lecture, Event Name: International Conference on Physical and Mathematical Modelling in Iron and Steelmaking

iii. RHF-EAF A SUSTAINABLE ROUTE OF STEELMAKING: AN EXERGY ANALYSIS at Indian Institute of Technology Bombay, India (13-12-2022 to 16-12-2022), Type: Invited Lecture, Event Name: Science and Technology of Ironmaking and Steelmaking

iv. Towards Green Steel Technology for Coal Based Economy at Indian Institute of Technology Roorkee, India (13-10-2022 to 15- 10-2022), Type: Keynote Lecture, Event Name: Advances in Materials and Processing: Challenges and Opportunities

v. RHF-EAF a sustainable route of steelmaking: An exergy analysis. Online invited talk at Tata Steel attended by around 40 people, 20th July, 2022, 4 to 6 PM.

vi. Recent Development in Green Steel: Special Steels Convention, Steel World, 4th March, 2022 (online mode).

vii. Calcium cored wire injection for stable casting: An insight into fundamentals and economics: ISIJ Meeting, Yokoyama, Japan, 9-13th September, 2019

viii. Mathematical Model for Gas Fired Rotary Hearth Furnace for Sponge Iron Production, NMD-ATM-2019, Hotel Marriott, Kolkata, Nov. 14-16, 2018

ix. Fundamentals and New Developments in Steel Making Process, Workshop on Advances of Iron & Steelmaking-Industrial Perspective, OPJCE, Raigarh, Oct., 1st, 2018

x. Mathematical Model for Gas Dynamics and Reduction in Gas Fired Rotary Hearth Furnace for Sponge Iron Production, International Conference on Processing and Characterization of Materials (ICPCM-2018), NIT Rourkella, 6-8th December, 2018

xi. Reduction of iron ore-coal composite pellets in multi-layer bed Rotary Hearth Furnace: Invited lecture, Asia Steel Conference, 6-9th February, Mayfair Hotel, Bhubaneswar, 2018

xii. Sponge Iron Production in Rotary Hearth Furnace: Investigation towards multi-layer bed: invited lecture at STIS-2017, IIT Kanpur, December 10-13, 2017

xiii. Role of fluid convection during fusion welding: invited lecture at AMPCO-2017, IIT Roorkee, November, 29 to December 1, 2017

xiv. Effect of beam oscillation on electron beam welded dissimilar joints: invited lecture at AWS conference, Chicago, 5-7th November, 2017

xv. Invited lecture on welding during Faculty development program at CVRCE, Bhubaneswar, 3rd May, 2017.

xvi. Understanding solidification during welding using CFD model, Workshop on Solidification and Phase Transformation,Centre of Excellence in Phase Transformation and Product Characterization (TEQIP II) Jadavpur University, Kolkata – 700032, August 26-27, 2016

xvii. Effect of beam oscillation on electron beam welded dissimilar joints, Golden Jubilee &Annual meet of NWS-2016, Science city, Kolkata,16-17th December, 2016

xviii. Emerging trends in Steel Technology, NMD ATM-2016, IIT Kanpur, 13-16 Nov, 2016

xix. Energy efficient Iron and steel making on integrated steel plant, 49th Steelmaking Operating Committee Meeting, Tata Steel, Jamshedpur, 13-14 December, 2016

xx. Non-Isothermal Model to Estimate the Rate Parameters and Thermal Efficiency for the Reduction of Iron Ore–Coal Composite Pellets in Multi-Layer Bed at Rotary Hearth Furnace, Asia Steel Conference-2015, Yokohama, Japan, 5th to 10th October, 2015

xxi. Processing of Iron Ore using Rotary Hearth Furnace: Understanding through Process Model, workshop of Emerging Technology on Iron Ore Processing, IMMT, Bhubaneswar, 27th May, 2015

xxii. Impact and significance of convective heat transfer calculations in welding: National Welding seminar, Jamshedpur, 22-24 January, 2015

xxiii. Development of an Indigenous Numerical Code for Welding of steel: National seminar on Automobile steel, JU, 2014

xxiv. Some calculations towards Rotary Hearth Furnace as a unit for chemical beneficiation of iron ore, 10-11 December, MPT-2013, IMMT, Bhubaneswar

xxv. Modeling and Simulation of Submerged Injection in Steel Melt, NMD ATM, Varanasi, November, 2013

xxvi. Cored Wire Injection in Steel Melt towards clean steel production, ARCS-13, SAIL R&D, Ranchi, 26-28th June, 2013

xxvii. Recovery & Efficacy of calcium Cored Wire Injection in Steel Melt towards clean steel production: Metallix-2013, JU, February, 2013

xxviii. Mathematical Modeling of Iron Ore Sintering process using Genetic Algorithm: KOMPLASTEC, Poland, 13-16th January, 2013

xxix. Cored Wire Injection in Steel melt, NML, Jamshedpur, 18th July, 2012

xxx. Mathematical Modeling of reduction kinetics of iron ore-coal composite pellets, IMMT, Bhubaneswar, 13th January, 2012

xxxi. Mathematical modeling of various welding processes, IGCAR, Kalpakkam, March 5th, 2010

xxxii. Application of Genetic Algorithm (GA) to estimate the rate parameters for reduction of iron ore-graphite composite pellets in a packed bed reactor, EMRS (European Materials Research Society) conference, 21-24th September, Poland, 2007

xxxiii. Computational fluid flow, heat and mass transfer in Metallurgical Processes: a case study, MAIA-2006, Department of Metallurgical & Materials Engineering, Jadavpur University, 29th July, 2006

xxxiv. Decay of Fluid Motion in a Filling Ladle: *National Seminar on Software Evolutions in Metallurgy: Academics and Industry*, January 7-8, 1999 at Institution of Engineers (I), 15 Haji Ali Park, Mumbai

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