Prof. Rajiv Shekhar
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Curriculum Vitae

Date of Birth

June 25, 1960

Education

B.Tech. (Metallurgical Engg.): Indian Institute of Technology (IIT) Kanpur, 1982.
MS (Metallurgical Engg.): University of California, Berkeley, 1985.
PhD (Metallurgical Engg.): University of California, Berkeley, 1988.

Professional Experience

- Director (3/2018 – 6/2023), IIT(ISM) Dhanbad.
- Visiting Faculty (12/2011 – 12/2013), IIT Jodhpur.
- Professor (2001 – 6/2025): Materials Science and Engineering, IIT Kanpur.
- Associate Professor (1997 – 2001): Materials and Metallurgical Engineering, IIT Kanpur.
- Assistant Professor (1990 – 1997): Materials and Metallurgical Engineering, IIT Kanpur.
- Asst. Research Engineer (5/1988 – 3/1990): University of California, Berkeley.

Leadership and Administrative Experience

1. Director (3/2018 – 6/2023), Indian Institute of Technology (Indian School of Mines) Dhanbad: *Completely revamped the (i) academic curriculum, (ii) research focus and infrastructure, (iii) academic and administrative governance systems, and (iv) sports and student governance system of ISM Dhanbad in line with the original five IITs.*

   Academics and R&D
   a) Both the UG and PG curriculum have been completely revamped with the introduction of choice-based credit system (CBCS) along with department and open electives. Double Major, Dual Degree and integrated PhD programs were introduced similar to original IITs.
   b) New academic programs were started: (i) M.Tech. in Data Analytics, Pharmaceutical Science and Engineering, (ii) MBA in Business Analytics, and (iii) MA in Digital Humanities and Social Science.
   c) Completely revamped the PhD program by (i) introducing courses, (ii) strengthening publications requirement for graduation (one q1/q2 journal of WOS), (iii) making thesis evaluation more rigorous. Indian examiners mostly from IITs and IISc and foreign examiners from QS 200 ranked institutions.
   d) Funds sanctioned for R&D projects increased from Rs 13 crore in FY 2017-18 to Rs 70 crores in FY 2022-23.
   e) The quality of publications increased significantly. From CY[1] 2018 - 2022, the number of q1/q2 publications of Web of Science increased from 523 (52%) – 934 (74%). This corresponded to a productivity increase from 1.8 to 2.7 publications per faculty.
   f) Invested ~Rs. 70 crores since 2018 in substantially upgrading UG/PG laboratory and Central Research Facility infrastructure to the level of an IIT.
   g) Instituted a Faculty Mobility Program for enhanced faculty – industry interaction.

h) Started a Sandwich PhD program that allows doctoral students to spend up to 6 months in a foreign university to improve their exposure to cutting edge research.
i) Set-up the Naresh Vashisht Centre for Hydrogen and CCUS Technologies through a Rs. 10 crore gift.
j) Set-up the Rs. 23 crore Tata Steel Innovation Centre on Mining and Mineral Research.
k) Advanced negotiations were underway to set-up two pilot plants in association with industry: (i) 2t/h high ash coal gasification plant with IOCL and L&T and (ii) composite ammonia dissociation and hydrogen combustion unit with Technip Energies in our proposed industrial park at the new campus in Nirsa.
l) Completely automated Academic and R&D governance systems.
m) Initiated offering of online professional courses through the Govt. of India portal NPTEL (https://nptel.ac.in/). Nine courses are already online.

Innovation and Entrepreneurship

a) Created a vibrant Institute Innovation Hub (I2H) consisting of:
   i) TEXMIN Foundation, a Rs. 110 crore company specializing in cyber-physical technology development, services, and human resource development in the areas of mining and exploration at IIT(ISM) Dhanbad. It has collaboration with major technology providers and mining companies and has assets worth more than Rs 450 crores.
   ii) The Naresh Vashisht Centre for Tinkering and Innovation (NVCTI) for training and product development in AI, digital technologies, robotics, and smart manufacturing for systematically leveraging the "untapped" potential of undergraduate students. It was set-up with a gift of Rs. 8 crores.
   iii) ACIC Foundation, a Not-for Profit company of the Atal Innovation Community Centre with a major focus on women empowerment.
b) Introduced a minor in Product Development Internship for UG students where students develop a product.
c) Started a unique field-based course on Social Entrepreneurship to give students exposure to problems at the ground level in education, health, environment, and marginalized communities.
d) Started an intra-state innovative ideas competition for schools in the state of Jharkhand to inculcate an innovative mindset in children.

Student Activities

a) Establishment of Students' Gymkhana with an elected Senate for active participation in the Institute's academic and administrative governance system.
b) Setting up a student counselling service at IIT(ISM) for the first time. Also engaged an Online 24x7 counselling Platform "YOUR DOST," which has proved to be a boon for students. I personally monitored and engaged with "red-flagged" students.
c) Significantly upgraded sports activities (i) by hiring coaches in all sporting disciplines for the first time ever and (ii) improvement in both indoor and outdoor sports infrastructure. IIT(ISM) came 9th in the last two Inter-IIT sports meet in 2018 and 2019, and 7th in 2022, with the best women athlete prize in 2019.
d) 24x7 access to students through email, cell phone, WhatsApp, and my "open" office hours.

Administrative Governance

a) Introduced a comprehensive WhatsApp-based communication system for all sections of the institute for fast response.
b) Streamlined PG admissions process by consolidating admissions to the PhD, M.Tech., 2 year MSc, and MBA under Chairman PG Admissions.
c) Streamlined and set up a rigorous, transparent, 4-stage new faculty selection system and introduced external peer review system for selection to the positions of Associate Professor and Professor.
d) From 2019 onwards, 135 offer letters were issued and 102 new faculty joined the institute.
e) Approval of a new, comprehensive "Cadre Structure and Recruitment Rules" for non-teaching

employees after I joined IIT(ISM).

f) A total of 253 non-teaching staff and officers have been recruited during my tenure. 109 internal employees have been promoted since 2020 when the departmental promotion scheme was implemented.
g) Employees started receiving their dues on the day of their superannuation.
h) File movement was completely automated by implementation of e-office since 2021.
i) Government e-marketplace was implemented in letter and spirit.
j) Completely upgraded and streamlined the operations of Student Placement, Campus Management Unit, Store and Purchase section, Health Centre, Guest House, Commercial Establishment and Security Unit to the level of older IITs.

2. IIT Kanpur (1990 – 2018)

a) Chairperson, Senate Undergraduate Committee (9/2016 – 3/2018), IIT Kanpur
   - Apex body for recommending policies and actions related to UG academics to the Academic Senate.
b) Member (1/2010 – 12/2011), Board of Governors, IIT Kanpur.
c) Head (1/2006 – 1/2009), Dept. of Materials and Metallurgical Engineering (re-named as Materials Science and Engineering), IIT Kanpur
   i) Framed long-term research vision.
   ii) Established mentoring system for academically deficient UG students.
   iii) Industrial networking of new faculty.
   iv) Doubling teaching laboratory facilities and laboratory modernisation.
   v) Introduced a transparent faculty hiring system.
   vi) Streamlined the accounts and inventory system of the department.
d) Member, Institute Academic Review Committee (2000 and 2008)
   Introduced for the first time in IIT Kanpur:
   (i) Double major.
   (ii) Minors.
   (iii) B.Tech. in Engineering Science.
   (iv) Science Electives.
e) Head, SIDBI Innovation and Incubation Centre, IIT Kanpur (2003 – 2006)
   i) Established the Business Incubator.
   ii) Set-up the Intellectual Property Rights and Technology Transfer Office
   iii) Started an Entrepreneurship Internship Programme for students of IIT Kanpur and other engineering colleges located in Kanpur.
f) Coordinator, Small-Scale Industries Cell, IIT Kanpur (2003 - 2006)
   i) New Business Opportunities workshops for Small-Scale industries Personnel from Kanpur.
   ii) Skill-based extension courses for industry personnel and students from local colleges in Kanpur.
g) Chairman, Health Centre Users Committee, IIT Kanpur (2002 – 2004)
   i) Implemented a new, cost-efficient, cashless health scheme for IIT Kanpur employees, which continues to this day.
   ii) Reduced medicine budget by 20% by streamlining the medicine procurement system.
h) Treasurer, Students' Gymkhana, IIT Kanpur (2000 – 2002).
i) Member Civil Advisory Committee, Institute Works Department, IIT Kanpur (2000 – 2001).
j) Warden, Hall of Residence No. III, IIT Kanpur (1991 – 1994).

3. IIT Jodhpur (12/2011 – 12/2013)

a) Head, Centre for Solar Energy Technologies (12/2011 – 12/2013), IIT Jodhpur.
b) Coordinator, Centre of Excellence in Energy (1/2012 – 7/2013), IIT Jodhpur.
c) Faculty i/c Campus Development, IIT Jodhpur: Led the Masterplan development of the new campus.

Areas of Specialisation

Application of transport phenomena and electrochemistry for process/reactor design in extractive metallurgy, manufacturing, pollution control, and solar thermal power using experiments and CFD-based mathematical modeling.

Areas of Research

1. Volumetric air receiver design for solar thermal energy generation with application in metals processing.
2. Advanced Hall-Heroult cells for primary aluminium production.
3. Air-agitated Pachuca tanks for leaching of non-ferrous ores.
4. Electrochemical refining of spent oxide and metallic nuclear fuels
5. Reduction of Indian nickeliferrous ores.
6. Electroremediation of heavy metal contaminated soils
7. Electrochemical deposition of magnetic multilayers for GMR applications.
8. Electrochemical drilling of deep micro-cooling holes in turbine blades.

Major Research Achievements

1. Design of a novel, green solar convective furnace for materials processing.
2. Design and fabrication of volumetric air receiver based solar thermal system.
3. Design of next-generation Hall-Heroult cells for aluminium smelting.
4. Design of Pachuca tanks for leaching of uranium.
5. Electrorefining of spent nuclear fuel.
6. Electroremediation of Cr(VI) contaminated soils.
7. Technology for drilling deep holes in super alloys using "shaped tube electrochemical drilling" to enhance cooling in turbine blades.

Teaching Experience

Introduction to Manufacturing Processes (UG[1]-Core), Metallurgical Kinetics (UG), Unit Operations in Extractive Metallurgy (UG), Process Plant Design for Metallurgical Engineering Operations (UG), Principles of metal extraction and refining (UG), Fluid Mechanics (for Mechanical Engineering UG students at IIT Jodhpur), Transport Phenomena (PG), Electrochemical Technology in Materials Processing (PG).

Executive Development Programmes

1. "Sustainable production of green steel," September 16-18, 2024, IIT Kanpur. Participants were from SAIL, Tata Steel, Jindal Steel, MECON, Arjas Steel, and Jayaswal NECO Industries.
2. Environmental Audit and Environmental Impact Assessment, November 13 - 17, 1995 and January 13 - 18, 1997, IIT Kanpur.

Sponsored Projects

1. "Establishing a centre of excellence in solar thermal research and education at IIT Jodhpur," MNRE, September 2011 – August 2016, Rs. 40 crores, (with several faculty from IIT Jodhpur). Was PI[2] till November 2013.
2. "Development of the International Center for Application of Solar Energy Technologies," Asian Development Bank, January 2012 – June 2014, US$200,000, (with Dr. L. Chandra of IIT

[1] UG = Under-graduate, PG = Post-graduate (Masters + PhD)

[2] PI = Project Investigator

Jodhpur). Was PI till November 2013.

3. "Development of magnetic field sensors based on metallic multilayers with high magnetoresistive sensitivity," ARMREB (DRDO), October 2007 – September 2009, Rs. 22.65 lakhs[3] (with Prof. M. Katiyar).
4. "Aqueous Nitriding of Steels by Electrolyte Plasma: Kinetics, Design, and Scale-up," DST**,** New Delhi, August 2007 – March 2010 (with Prof. R. C. Sharma and Prof. R. K. Thareja),Rs. 18.27 lakhs.
5. "Molten salt electrodeposition of rare-earths and actinides," BRNS, DAE, Govt. of India, June 2004 – March 2008, Rs. 21.16 lakhs.
6. "Electroremediation of Heavy Metal Contaminated Soils: Pilot-Scale Studies for Technology Development," MHRD, Govt. of India, April 2003 – March 2005, Rs. 8 lakhs.
7. "Electrodeposition of magnetic multilayers with high giant magnetoresistance," ARMREB (DRDO), November 2002 – October 2005. (with Prof. M. Katiyar).
8. "The analysis of fused deposition through electrochemical discharge," DST**,** New Delhi, April 2002 - March 2005 (with Prof. A. Ghosh)
9. "Electroremediation of heavy metal contaminated soil: Design, scaleup and optimisation," CSIR**,** New Delhi**,** April 2000 - March 2003 (in collaboration with Regional Research Laboratory, Bhubaneshwar).
10. "Design and development of shaped tube pulse electrochemical machining for drilling deep microholes in inconel alloys," DST, Govt. of India**,** New Delhi, April 2001**–** March 2003 (with Prof. V. K. Jain).
11. "Studies on magnetohydrodynamics in electrically driven melt flow," DST, Govt. of India, New Delhi, April 1995 **–** March 2001 (with Prof. S. P. Mehrotra).
12. "Reclamation of values from industrial wastes and effluents," AICTE**,** New Delhi, April 1995 – March 1999 (with Prof. S. P. Mehrotra).
13. "Design, scaleup and optimisation of Pachuca tanks," BRNS, Department of Atomic Energy, April 1992 - June 1995 (with Prof. S. P. Mehrotra).

Consultancy Projects

1. "Identification of suitable business opportunities," Shree Cements Pvt. Ltd., Kolkata, Rs. 6.35 lakhs, April 2010 – September 2010.
2. "Modelling of the electrorefining cell in the pyroprocessing demonstration facility," IGCAR, Kalapakkam, Rs. 15.0 lakhs, April 2008 – March 2010.
3. "Determining the commercial feasibility of manufacturing silicon and a mineral-related plant," Shree Cements Pvt. Ltd., Kolkata, Rs. 1.34 lakhs, March 2008 – October 2008.
4. "Day ahead auction software for power exchange," National Commodity & Derivatives Exchange Limited (NCDEX), Mumbai, Rs. 5.0 lakhs, October 2006 – February 2007 (with Prof. P. K. Kalra).
5. "Prefeasibilty studies for identifying training needs by electric distribution utilities," Institute of International Education (IIE), Washington, D.C. (U.S.A.), Rs. 5.0 lakhs, May 2004 (with Prof. P. K. Kalra).
6. "Development of an integrated software platform for evaluating Environmental Impact Assessment reports of thermal power plants," Infrastructure Development and Finance Company, Mumbai, Rs. 8.0 lakhs, August 2000 - August 2002.
7. "Achieving refractory consumption of international benchmark level in integrated steel plants," RDCIS, SAIL, Ranchi, Rs. 13.0 lakhs, October 1999 - June 2002 (with Prof. N. N. Kishore and Prof. P. K. Kalra).
8. "Use of slotted anodes to achieve power saving in pots of HINDALCO," Accenture Inc., New Delhi, Rs. 0.75 lakhs, January 2001 – February 2001.

Patents Granted

[3] 1 lakh = 100,000; 1 crore = 100 lakhs.

1. V. K. Jain, D. S. Bilgi, A. V. Kulkarni, A. Chavan, R. Shekhar: “Process for drilling contoured deep hole in super alloys using STED to enhance cooling in turbine blades,” 2007.

Publications in Refereed Journals

1. P. Sharma, G. Singh, R. Shekhar, L. Chandra, P. S. Ghoshdastidar: “Experimental investigation of a convergent nozzle for thermal homogenization of air,” International Journal of Energy for a Clean Environment, v 26 (2), 2025, pp.1-12.
2. Rajiv Shekhar, Sheo Shankar Rai: “Technology is key to green coal mining,” CSI Transactions on ICT, v 12(1-3), 2024, pp. 5-11.
3. Vishwa Deepak Kumar, Laltu Chandra, Sudipto Mukhopadhyay, Rajiv Shekhar: “Simulated experimental assessment of a laboratory-scale solar convective furnace system,” Journal of Solar Energy Engineering, v 145(4), 2023, pp. 041011 (1-11).
4. Vishwa Deepak Kumar, Gurveer Singh, Laltu Chandra, Sudipto Mukhopadhyay, Rajiv Shekhar : “A multi-zone unsteady heat transfer model for an open volumetric air receiver: a step towards scale-up and design optimization,” International Journal of Heat and Mass Transfer, v 191, 2022, https://doi.org/10.1016/j.ijheatmasstransfer.2022.122747.
5. P. Sharma, L. Chandra, P. S. Ghoshdastidar, R. Shekhar: “ A novel approach for modelling fluid flow and heat transfer in an open volumetric air receiver using ANSYS-FLUENT,” Solar Energy, v 204, 2020, pp. 246-255.
6. G. Singh, V. Kumar, P. S. Ghoshdastidar, R. Shekhar, L. Chandra: “One-dimensional zonal model for the unsteady heat transfer analysis in an open volumetric air receiver,” Accepted for publication, Journal of Thermal Science and Engineering Applications, v 13, 2021, pp. 011011.
7. N. Shukla, M. K. Harbola, K. Sanjay, R. Shekhar: “Electrochemical fencing of Cr(VI) from industrial wastes to mitigate ground water contamination,” Trans Indian Inst Met, v 70, 2017, pp. 511-518.
8. D. Patidar, S. Tiwari, P. Sharma, R. Pardeshi, L. Chandra, R. Shekhar: “Solar convective furnace for metals processing,” JOM, v 67, 2015, pp. 2696-2704.
9. G. Singh, D. Saini, N. Yadav, L. Chandra, R. Shekhar: “Dust Deposition Mechanism and Cleaning Strategy for Open Volumetric Air Receiver Based Solar Tower Sub-systems,” Energy Procedia, v 69, 2015, pp. 2081-2089.
10. P. Sharma, R. Sarma, L. Chandra, R. Shekhar, P. S. Ghoshdastidar: “On the design and evaluation of open volumetric air receiver for process heat applications,” Solar Energy, v 121, 2015, pp. 41-55.
11. Ajeet K Srivastav, Rajiv Shekhar: "Nucleation and growth mechanism of Co-Pt alloy nanowires electrodeposited within alumina template," Journal of Nanoparticle Research, v 17, 14, 2015.
12. P. Sharma, R. Sarma, L. Chandra, R. Shekhar, P. S. Ghoshdastidar: "Solar tower based aluminium heat treatment system: Part I. Design and evaluation of an open volumetric air receiver," Solar Energy, v 111, 2015, pp. 135-150.
13. D. Patidar, S. Tiwari, P.K. Sharma, L. Chandra, R. Shekhar: “Open volumetric air receiver based solar convective aluminum heat treatment furnace system,” Energy Procedia, v 69, 2015, pp. 506-517.
14. V. Kumar, Govind, K. Philippe, K. Balani: “Processing and nano-mechanical characterization of Mg-Li-Al based Alloys,” Procedia Materials Science, v 5, 2014, pp. 585–59.
15. N. Gupta, R. Shekhar, P. K. Kalra: "Computationally efficient composite transmission expansion planning: a pareto optimal approach for techno-economic solution,” accepted for publication, International Journal of Electrical Power and Energy Systems, v 63, 2014, pp. 917-926.
16. A. K. Srivastav, R. Shekhar: “Crystal anisotropy induced temperature dependent magnetization in cobalt nanowires electrodeposited within alumina template,” Journal of Magnetism and Magnetic Materials, v 349, 2014, pp. 21-26.
17. M. Karnik, A. Ghosh, R. Shekhar, “The mechanism of electrochemical discharge (ECD),” Key Engineering Materials, v 572, 2014, pp. 295-299.
18. N. Gupta, R. Shekhar, P. K. Kalra: “Probabilistic transmission expansion planning: congestion management based roulette wheel simulation for optimal capacity,” International Journal of

Electrical Power and Energy Systems, v 43, 2012, pp 1259-1266.
19. K. Sanjay, R. P. Das, R. Shekhar, : "Electroosmotic pump: "Rate controlling mechanism for unusually fast electroremediation kinetics of Cr(VI) in basic Kanpur soil," Electrochimica Acta, v 86, 2012, pp. 80-88.
20. V. Kumar, Govind, R. Balasubramaniam, R. Shekhar, K. Balani: "Microstructure evolution and texture development in thermomechanically processed Mg–Li–Al based alloys," Mater. Sci. Eng. A, v 547, 2012, pp. 38–50.
21. V. Kumar, R. Balasubramaniam, R. Shekhar, K. Balani: "Microstructure and texture evolution during hot rolling of Mg-9Li-7Al-1Sn alloy for aerospace application," Material Science Forum, v 702-703, 2012, pp. 85-88.
22. K. Shiva Kumar, A. Roy, A. Raghunath, R. C. Sharma, R. Shekhar: "Feasibility and kinetics of nitriding of pure titanium and Ti-6Al-4V in the molten salt bath of potassium nitrate," Surface Engineering, v 28, 2012, pp. 458-463.
23. K. Sanjay, R. Shekhar: "Electrokinetic cleaning of industrial residues," Trans. Inst. Min. Metall. C, v 121, 2012, pp. 117-120.
24. V. Kumar, Govind, R. Shekhar, K. Balani: "Effect of hot rolling on microstructure and texture evolution of Mg-Li based alloy," Material Science Forum, v 690, 2011, pp. 347-350.
25. M. Karnik, A. Ghosh, R. Shekhar, "Polarity dependence of the electrochemical discharge(ECD)," Key Engineering Materials, v 486, 2011, pp. 131-134.
26. R. Thudum, A. Srivastava, S. Nandi, A. Nagaraj, R. Shekhar: "Molten salt electrolysis of neodymium: electrolyte selection and deposition mechanism," Trans. Inst. Min. Metall. C, v 119 (2), 2010, pp. 88-92.
27. M. Karnik, A. Ghosh, R. Shekhar: "Fused deposition process combining electrochemical discharge with high speed selective jet electrodeposition," Trans IMF, v 87 (5), 2009, pp. 264-271.
28. A. Roy, S. J. Parihar, A. Singh, R. C Sharma, R. Shekhar: "Quench hardening of 0.4 % C steel by using aqueous electrolyte plasma as heat source," Surface Engineering, v 25 (6), 2009, pp.423- 429.
29. D. Pradhan, T. Sripadmini, P. Pradhan, M. Katiyar, R. Shekhar: "Effect of electrode configuration and mode of deposition on magnetoresistance in electrodeposited Co/Cu multilayers on n-Si by a fully electrochemical method," Electrochimica Acta, v 54 (2), 2008, pp. 430-433.
30. D. S. Bilgi, R. Kumar, V. K. Jain, R. Shekhar: "Predicting Radial Overcut in Deep Holes Drilled by Shaped Tube Electrochemical Machining," International Journal of Advanced Manufacturing Technology, v 39 (1-2), 2008, pp. 47-54.
31. A. Roy, R. K. Tewari, R.C. Sharma, R. Shekhar: "Aqueous electrolyte plasma nitriding: A feasibility study," Surface Engineering, v 23, 2007, pp. 243-246.
32. S. N. Lenka, S. P. Mehrotra, R. Shekhar: "Magnetohydrodynamics in advanced Hall-Heroult cells: Physical modelling of flow in a laboratory-scale cell, Trans. Inst. Min. Metall. C, v 116, 2007, pp. 177-182.
33. D. Bhunia, S. P. Mehrotra, R. Shekhar: "A novel probe for measuring current distribution in wood's metal in a simulated Hall-Heroult cell," Trans. Inst. Min. Metall. C, v 115**,** 2006, pp. 206-212.
34. M. Sankar, N. K. Batra, R. Shekhar, S. P. Mehrotra: "Roasting, reduction and leaching of Indian ilmenite ore for producing synthetic rutile," Trans. Indian Institute of Metals, v 59, 2006, pp. 381-387.
35. D. S. Bilgi, V. K. Jain, R. Shekhar, A. V. Kulkarni: "Hole quality and interelectrode gap dynamics during pulse current electrochemical deep hole drilling," International Journal of Advanced Manufacturing Technology, v. 34, 2007, pp. 79-95.
36. D. S. Bilgi, V. K. Jain, R. Shekhar, S. Mehrotra:" Electrochemical deep hole drilling in super alloy for turbine application," Journal of Materials Processing Technology, v 149, 2004, pp. 445-452
37. K Sanjay, A. Arora, R Shekhar, R P Das: "Electroremediation of Cr(VI) Contaminated Soils: Kinetics and Energy Efficiency," Colloids and Surfaces A: Physicochemical and Engineering Aspects, vol. 222, 2003, pp. 253-259
38. M. Manna, K. Sanjay, R Shekhar: "Electrochemical Cleaning Of Soil Contaminated With A

Dichromate Lixiviant," International Journal of Mineral Processing, vol. 1696, 2003, pp. 401-406
39. S. Sharma, V. K. Jain, and R. Shekhar: "Electrochemical drilling of inconel superalloy with acidified NaCl electrolyte," International Journal of Advanced Manufacturing Technology, vol. 19, 2002, pp. 492–500.
40. S. P. Mehrotra and R. Shekhar: "Particle suspension in air-agitated Pachuca tanks: Investigation of hysterisis and a novel split air injection technique," Metallurgical and Materials Transactions B, vol. 32B, April 2001, p. 223.
41. G. G. Roy, R. Shekhar, S. P. Mehrotra: "Particle suspension in (air-agitated) Pachuca tanks," Metallurgical and Materials Transactions B, vol. 29B, April 1998, p. 339.
42. T. Chandrashekhar, R. Shekhar, S. P. Mehrotra: "Solid-liquid mass transfer in air-agitated Pachuca tanks," Transactions of the Institution of Mining & Metallurgy, Section C, vol. 107, 1998, p. C151.
43. N. K. Nath, N. Chakraborti, R. Shekhar: "Reduction of Indian nickeliferrous ore with gas flowing vertically through the bed," Scandinavian Journal of Metallurgy, vol. 27, 1998, p. 14.
44. N. K. Nath, N. Chakraborti, R. Shekhar: "Reduction of Indian nickeliferrous ore with gas flowing horizontally over the bed," Scandinavian Journal of Metallurgy, vol. 26, 1997, p. 158.
45. G. G. Roy, R. Shekhar : "Oxygen mass transfer in (air-agitated) Pachuca Tanks: Part II: Mathematical modelling of mass transfer coefficients," Transactions of the Institution of Mining & Metallurgy, Section C, vol. 105, 1996, p. C16.
46. G. G. Roy, R. Shekhar: "Oxygen mass transfer in (air-agitated) Pachuca Tanks : Part I Laboratory-scale experimental measurements," Transactions of the Institution of Mining & Metallurgy, Section C, vol. 105, 1996, p. C9.
47. R. Shekhar, J. W. Evans: "Physical Modelling studies of electrolyte flow due to gas evolution and some aspects of bubble behaviour in Advanced Hall Cells: Part III Predicting the performance of advanced Hall cells," Metallurgical Transaction B., February 1996, p. 19.
48. N. K. Nath, N. Chakraborti, R. Shekhar: "Selective reduction of nickeliferrous ore : Part I Single pellet experiments," Scandinavian Journal of Metallurgy, vol. 24, 1995, p. 121.
49. R. Shekhar, J. W. Evans: "Physical Modelling studies of electrolyte flow due to gas evolution and some aspects of bubble behaviour in Advanced Hall Cells: Part II Flow and interpolar resistance in cells with a grooved anode," Metallurgical Transaction B., June 1994, p. 341.
50. R. Shekhar, J. W. Evans: "Physical Modelling studies of electrolyte flow due to gas evolution and some aspects of bubble behaviour in Advanced Hall Cells: Part I Flow in cells with a flat anode," Metallurgical Transaction B., June 1994, p. 333.
51. R. Shekhar, J. W. Evans: "Fluid flow and interpolar resistance measurements in Advanced Hall-Heroult cells," Mineral Processing and Extractive Metallurgy Review' Vol. 9, 1992. p. 135.
52. R. Shekhar, J. W. Evans: "Fluid flow in Pachuca (air agitated) tanks. Part II: Mathematical Modelling of flow in Pachuca Tanks." Metallurgical Transaction B., December 1990, p.191.
53. R. Shekhar, J. W. Evans: "Fluid flow in Pachuca (air agitated) tanks. Part I: Laboratory-scale experimental measurements," Metallurgical Transaction B., December 1989, p.781.

Thesis Supervision

PhD

1. A. Gupta, 2017, "Hydrodynamic design of drained cathode Hall-Héroult cell," Dr. B. Basu, ABSTL (Co-guide).
2. Piyush Sharma, 2017, "Design of open volumetric air receiver for concentrated central solar tower system," Dr. P. Ghoshdastidar, Dr. L. Chandra, IIT Jodhpur (Co-guides).
3. D. Singh, 2012, "Combinational load shedding methodology for power distribution system," Dr. P. K. Kalra (Co-guide).
4. N. Gupta, 2012, "Transmission expansion planning," Dr. P. K. Kalra (Co-guide).
5. Vinod Kumar, 2011, "Microstructural, mechanical and electrochemical characterization of thermomechanically processed Mg-Li-Al based alloys" Dr. K. Balani, Dr. R. Balasubramaniam (Co-Guide).
6. K. Sanjay, 2008, "Electroremediation of Cr(VI) contaminated soils: Kinetics, design and scale-

up."
7. M. Karnick, 2007, "Fused deposition through electrochemical discharge," Dr. A. Ghosh (Co-guide)
8. D. S. Bilgi, 2005, "Electrochemical deep hole drilling in superalloys" Dr. V. K. Jain (Co-guide).
9. G. G. Roy, 1996, "Gas liquid mass transfer and particle suspension in air-agitated Pachuca tanks."
10. N. Nath, 1995, "Reduction roasting of nickeliferrous ore in multiple hearth furnace," Dr. N. Chakraborti (Co-guide).

M.Tech.

1. D. Kumar, 2013, "Design and evaluation of experimental thermal energy storage," Dr. L. Chandra, IIT Jodhpur (IITJ) (Co-guide).
2. R. N. Verma, 2013, "High heat flux characterization and power balance of non-transfer plasma jet," Dr. L. Chandra, IITJ) and Dr. P. K. Jayakumar, NFTDC, Hyderabad (Co-guides).
3. V. K. Verma, 2013, "Design and development of glass-metal joints and their characterization for solar receiver tube," Dr. R. Chhibber, IIT and Dr. L. Abhinandan, RRCAT (Co-guides).
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