



DR. PANKAJ KUMAR JAIN
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CONTACT

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RESEARCH INTERESTS

- Gravity Concentration
- Equipment Design and Development
- E-waste processing
- Physical separation processes
- Dry Processing

ONGOING PROJECTS

REE beneficiation and extraction
Graphite Schist beneficiation
Gold Ore beneficiation and extraction
PG minerals beneficiation
Magnesite ore beneficiation

INTERNATIONAL PROJECTS

Bhutan, Australia

EDUCATION

Degree Name	Specialization	Year	Institute
B. Tech. & M. Tech. (Dual Degree)	Mineral Engineering & Mineral Resource Management	2012	ISM
Ph.D.	Mineral Engineering	2018	IIT (ISM)

EXPERIENCE

Assistant Professor, IIT (ISM) Dhanbad: Mar 2013 to present

RESEARCH SUMMARY*

- ❖ Research Projects – 06 (Completed), 02 (Ongoing)
- ❖ Research papers – 04 (Q1/Q2 Journals)
- ❖ Book Chapter Publication – 04
- ❖ Patents – 04
- ❖ Industrial Consultancy – 04 (Completed), 02 (ongoing)
- ❖ Membership of Professional Societies – 01

RESEARCH SCHOLARS

- Full time: 03
- Part time: 03

ONGOING RESEARCH

- Design and development of Film Concentrator, Enhanced Gravity Concentrator, High-Tension separator
- Beneficiation of iron ore using gas-solid fluidized bed separator
- Recovery of metals from e-waste using physical separation methods
- Recovery of Au, Nd, Pt, Ru, Rh from gold ore tailings
- Li-ore processing

EXPERTISE

- 🔧 Mineral Processing Equipment Selection
- 🔧 Mineral Processing Flowsheet Design
- 🔧 Fine and low-grade Mineral Processing
- 🔧 Critical Minerals processing and extraction
- 🔧 Equipment design and development
- 🔧 Mineral Processing Plant Audit

* See Annexure for more details

Annexure

INDUSTRIAL TRAINING

Organization	Duration
HZL, Rampura Agucha Mines, Vedanta	Six Weeks
JCPP, Tata Steel Limited, Jamadoba, Jharia	Six weeks

INDUSTRIAL EXPOSURES

- Noamundi Iron Mine and Processing plant, Tata Steel, Jharkhand
- SAIL Gua iron ore mine and processing plant, SAIL, Jharkhand
- Prism Johnson Cement Making plant, Satna, MP
- Sintering and steel making plant, Electrosteel Steel Limited, Bhagabandh, Jharkhand
- IISCO Steel Plant, Bernpur, Asansol, West Bengal
- McNally Sayaji Engineering Limited, Kumardhubi, Jharkhand
- Bokaro Steel Plant, SAIL, Bokaro, Jharkhand
- Uranium Corporation of India Limited (UCIL), Jaduguda, Jharkhand
- Indian Copper Complex (ICC), Ghatshila, Jharkhand
- Malanjkhand Copper Project (MCP), Balaghat, Mahdy Pradesh
- Hindustan Zinc Limited (HZL), Rampura Aghucha Mines, Rajasthan
- HZL Debari Smelter, Udaipur, Rajasthan
- MMIPL Gold processing and extraction plant, Lawa Gold Mines, Jamshedpur
- BHEL Hyderabad
- NMDC R&D Division, Hyderabad
- Magnesite Ore processing plant, Young, Australia
- Jindal Stainless Limited (JSL), Jajpur, Odisha
- Jamadoba Coal Preparation Plant, Jharia Division, Tata Steel Limited, Jharkhand
- Bhelatand Coal Preparation Plant, Jharia Division, Tata Steel Limited, Jharkhand
- West Bokaro Coal Preparation Plant, Ghatotand, Tata Steel Limited, Jharkhand
- Moonidih Coal Washery, BCCL Dhanbad, Jharkhand
- Mahuda Coal Washery, BCCL Dhanbad, Jharkhand
- Sudamdih Coal Washery, BCCL Dhanbad, Jharkhand
- Patherdih NLW Coal Washery, BCCL Dhanbad, Jharkhand
- Dahibari Coal Washery, BCCL Dhanbad, Jharkhand
- Chasnala Collieries, Dhanbad, Jharkhand

RESEARCH PROJECTS

Sl. No.	Project Title	Funding Agency	Status
1.	To study the pelletization of fine particles of iron and manganese ores	Institute funded	Completed
2.	Characterization and beneficiation studies on auriferous quartzite ore for producing concentrate for recovery of gold	MMIPL Jamshedpur	Completed
3.	To develop POC for beneficiation and extraction of REE from samples collected from BCCL mines	Texmin Foundation	Completed
4.	To develop a working prototype for High tension separator for dry separation of conducting particles	Texmin Foundation	Completed
5.	To develop a working prototype for an Enhanced Gravity Separator (EGS) for recovery of REE and precious metals	Texmin Foundation	Completed
6.	Design and development of a continuous film concentrator for processing fine particles	Self-funded	Completed
7.	Recovery of Au, Pd, Pt, Ru, Rh, Rb from gold ore tailings	MMIPL Jamshedpur	Ongoing
8.	Design and development of dry density separator for fine particle (<6mm) processing	Self-Funded	Ongoing

RESEARCH PAPERS

- Jain, P. K. (2021), An analytical approach to explain complex flow in spiral concentrator and development of flow equations, *Minerals Engineering*, 2021, 107027, ISSN 0892-6875, <https://doi.org/10.1016/j.mineng.2021.107027>
- Jain, P. K. (2021). A novel concept of composite coefficient of friction for slurry systems and development of flow equations for spiral concentrators. *Powder Technology*, 386, 411–419. <https://doi.org/10.1016/j.powtec.2021.03.058>
- Jain, P. K., & Rayasam, V. (2017). An analytical approach to explain the generation of secondary circulation in spiral concentrators. *Powder Technology*, 308, 165–177. <https://doi.org/10.1016/j.powtec.2016.11.040>
- Jain, P. K., Bhattacharya, S., & Kumar, S. (2016). Recovery of combustibles from electrostatic precipitator discharge. *Waste Management and Research*, 34(6). <https://doi.org/10.1177/0734242X16636956>

BOOKS & MONOGRAPHS

Authors	Title of Book/ Chapter	Publisher	Year of Publication	ISSN/ISBN
Pankaj Kumar Jain	Gravity (Density) Separation	Elsevier	2025 Expected	
Pankaj Kumar Jain	Electrostatic Separation	Elsevier	2025 Expected	
Pankaj Kumar Jain	Magnetic Separation	Elsevier	2025 Expected	
Pankaj Kumar Jain, N R Mandre, Sumantra Bhattacharya	Flotation	Elsevier	2025 Expected	

PATENTS

Title	Inventor	Year of filing	Patent No.	Status
A method and device for concentration of solar radiation and obtaining concentrated plane beam	Pankaj Kumar Jain	2010	293820	Granted, 2018
A shredding device for shredding plastic and paper material into near-powdered form and method thereof	Pankaj Kumar Jain, Prof. A. Chattopadhyay	2016	427735	Granted, 2023
A device with an improved design of Sharpening blade with application in pencil sharpener	Pankaj Kumar Jain	2021	532620	Granted, 2024
A device to clean ambient air with filter cloth and a method of recovery thereof	Pankaj Kumar Jain, Kesavan Ravi	2021	508409	Granted, 2024
A continuous mineral concentrator for separation of fine heavy and light mineral particles	Pankaj Kumar Jain	2024		Submitted

INDUSTRIAL CONSULTANCY PROJECTS

Financial Year	Title	Organization Name	Total Amount (₹)	Status
2013-14	Characterization of dry solids obtained from ESP discharge	Prakash Industries Limited	73,000	Completed
2013-14	Technical Feasibility study on recovery of Uranium bearing minerals from tailing of Mosaboni Copper Concentrator	Uranium Corporation of India Limited (UCIL), Jaduguda	15,00,000	Completed
2017-18	Ball Mill Size Calculations for limestone grinding under wet conditions	Bharat Heavy Electricals Limited (BHEL) Hyderabad	40,00,000	Completed
2022-23	Characterization and Beneficiation studies on low-grade graphite ore from Khepcheshi Hill, Chelela, Bhutan	State Mining Corporation Limited, Bhutan (International)	30,00,000	Completed
2023-24	Characterization and Beneficiation Studies on Magnesite ore for Flowsheet Development	Causmag International, Australia (International)	18,00,000	Ongoing
2024-25	Sampling and quality assessment of reject/slurry of all washeries of BCCL	BCCL Dhanbad	56,34,500	Ongoing