

Brief Bio-data

1. Name: Dr. Rakesh Kumar

2. Date of Birth: 05/01/1974

3. Current Position and Address:

Senior Principal Scientist, Rockmass Characterisation and Innovative Mining Methods Section, Room No. 22, Main Building, CSIR-CIMFR, Barwa Road, Dhanbad- 826015, Jharkhand.
Email ID: rakesh@cimfr.nic.in, **Contact Number:** +91 94313292718

4. Educational qualifications:

Sl. No.	Degree	Year	University/Institute	Subject
1.	Ph. D.	2018	IIT (ISM) Dhanbad	Mining Engineering
2.	M. Tech.	1999	IIT (ISM) Dhanbad	Open Cast Mine Engineering
3.	B. E.	1996	GVIT. KGF	Mining Engineering

5. Work experience:

Designation	Institute/company	From	To	Work
Senior Research Fellow	CSIR-CIMFR	01.02.2002	12.07.2004	R&D
Scientist 'C'	CSIR-CIMFR	13.07.2004	12.07.2008	R&D
Senior Scientist	CSIR-CIMFR	13.07.2008	12.07.2012	R&D
Principal Scientist	CSIR-CIMFR	13.07.2012	12.07.2018	R&D
Senior Principal Scientist	CSIR-CIMFR	13.07.2018	Till Date	R&D

6. Work Area(s)/ Specialization:

Thick Seam Mining & Strata Mechanics covering rock mechanics and mining methods, Underground Instrumentation and Monitoring of Strata.

7. Major contributions

Instrumentation and monitoring related to strata control and stability of underground structures, Design of different geotechnical elements of a continuous miner based mechanised depillaring for safe and efficient coal extraction, Field study and laboratory tests are being carried out to develop an approach to design rib/snook, breaker line supports, cut-out distance and prediction of roof fall during mechanised depillaring, Investigation of coal pillar stability for safe and efficient extraction of coal thick coal seam

8. No. of Research Publications:

- Papers in Journals: 26
- In conference proceedings: 25
- Invited lectures delivered: 0
- List of best 05 publications:
 - i. **Kumar R**, Mishra AK, Singh AK, Singh AK, Ram S, Singh R. Depillaring of total thickness of a thick coal seam in single lift using cable bolts: a case study. Int J Min Sci Tech 2016;26;223-233.
 - ii. **Kumar R**, Singh AK, Mishra AK, Singh R. Underground mining of thick coal seams. Int J Min Sci Tech 2015;25:885-896.
 - iii. Kumar A, Kumar D, Singh AK, Ram S, **Kumar R**. Development of empirical model for strength estimation of irregular-shaped-heightened-rib/snook for mechanised depillaring. Accepted for publication in Int J Rock Mech Min Sci 2021.
 - iv. Kumar A, Kumar D, Singh AK, Ram S, **Kumar R**, Gautam A, Singh R, Singh AK. Roof sagging limit in an early warning system for safe coal pillar extraction. Int J Rock Mech Min Sci 2019;123:104131.
 - v. Singh AK, Singh R, Maiti J, Mandal PK, **Kumar R**. Assessment of mining induced stress development over coal pillars during depillaring. Int J Rock Mech Min Sci 2011;48:805-818.

- Books/Chapters authored/edited: 01

9. List of 5 Major Contract R&D Projects:

- Development of a model vis-à-vis study of parameters influencing abutment loading of pillars at a depillaring face of shallow depth cover and under massive strata, sponsored by Ministry of Coal, Govt. of India.
- Development of a mining method for final extraction of a critically thick coal seam standing on pillars along the roof horizon, sponsored by Ministry of Coal, Govt. of India.
- Scientific study of strata movement during widening and heightening of existing galleries and depillaring of CM panels A1-A and A1-B of No. 1 at GDK-11 Incline mine, RG-I Area, SCCL through underground instrumentation and monitoring.
- Scientific study to assess the efficacy of the support system during the working of the panel and thereafter continuously monitor the strata movement from the outside of the panel till the completion of extraction in the panel and two subsequent years at Sarni UG Mine E3 panel of Pathakhera Area, WCL.

10. (a) Name of Patents/Copyrights applied/granted/commercialized:

- Indigenous design of rib/snook for mechanised depillaring.
- A method for efficient design of breaker line support in mechanised depillaring.
- Combined-Instrument-Approach (CIA) for analysis of underground instrumentation data
- A novel method for underground extraction of coal from a critically thick coal seam standing on pillars and the development made along the roof horizon.

(b) Technologies/Products /knowhow/Services developed:

- Developed design norms for different elements of Continuous Miner based Mechanised Depillaring like rhomboid-shaped coal pillars, cut-out distance, systematic support system, rib/snook and roof bolts-based goaf edge support design.
- Developed an empirical formula to estimate strength, competent area, effective width and width-to-height ratio of irregular shaped rib/snook during mechanised depillaring.
- Developed an empirical formula to fix roof sagging limit in auto warning tell-tale equipment for early warning of dangerous condition during coal pillar extraction.
- Developed support rock bolt-based goaf edge support for conventional depillaring with stowing
- Developed numerical modeling and field investigation-based performance evaluation of underground structures using extensive ground control study with the help of different geotechnical instruments and automation of measurements of strata movement.

11. Honors/Awards/Recognitions/Fellowships/Scholarships/Professional Memberships received:

- Silver Medal of the Mining Geological & Metallurgical Institute of India- 2005
- Life Member of MEAI, MGMI and SME

12. Societal Contributions : Our R&D contributions resulted into following societal contributions:

- Encourages the industry to adopt the underground mining methods for coal extraction.
- Resulted into reduction in disastrous environmental impacts (air and water pollution) on surrounding area, flora and fauna by openpit.
- Improved coal quality and production and replaced the intervention of foreign consultant.
- Substituted the import of coal to some extent saving huge amount of foreign reserves and enabled the country to be self-reliant in terms of coal.
- Voluntarily involved in different government programmes organized at CSIR-CIMFR for dispersion of science among the masses.
- Involved in imparting summer or winter training to students of IITs, NITs and different private and government regional colleges.
- Involved in imparting training to the miners about mining methods and strata control.