

Brief Bio-data

1. Name: Dr. Ashok Kumar

2. Date of Birth: 02-10-1990

3. Current Position and Address:

Scientist, Rockmass Characterisation and Innovative Mining Methods Section, Room No. 17 Main Building, CSIR-CIMFR, Barwa Road, Dhanbad- 826015, Jharkhand. **Email ID:** ashok@cimfr.nic.in/ashok.bhu.min09@gmail.com, **Contact Number:** +91 8603401161

4. Educational qualifications:

| Sl. No. | Degree | Year | University/Institute | Subject |
|---------|----------|------|----------------------|-------------------------|
| 1. | Ph. D. | 2021 | IIT (ISM) Dhanbad | Mining Engineering |
| 2. | M. Tech. | 2015 | AcSIR, New Delhi | Mine Safety Engineering |
| 3. | B. Tech. | 2013 | IIT (BHU) Varanasi | Mining Engineering |

5. Work experience:

| Designation | Institute | From | To | Nature of Work |
|-------------------|-------------|------------|------------|----------------|
| Scientist | CSIR-CIMFR | 11-04-2016 | Continuing | R&D |
| Scientist-I | NIRM | 04-12-2015 | 11-04-2016 | R&D |
| Trainee Scientist | CSIR- CIMFR | 08-08-2013 | 03-12-2015 | R&D |

6. Work Area(s)/ Specialization:

Underground Mining Methods, Strata/Rock Mechanics, Underground Instrumentation and Monitoring of Strata, Numerical Modeling, Rock Blasting, FLAC3D, AUTOCAD, WIPFRAG

7. Major contributions

Extensive field and numerical modelling studies provided valuable addition to R&D in mining industry. Some of the important R&D contributions are explained under the Section 10 for details of Patents and Technologies/ Products /knowhow/Services developed.

8. No. of Research Publications:

- Papers in Journals: 14 [IJRMMS (Q1)-5, JGSI(Q2)-3, AJGS (Q3)-3, MME(Q3)-1]
- In conference proceedings: 17 [International Conferences-14]
- Invited lectures delivered: 0
- List of best 05 publications:

- Kumar A**, Kumar D, Singh AK, Ram S, Kumar R (2021). 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. (Q1, IF-7.135)
- Kumar A**, Kumar D, Singh AK, Ram S, Kumar R, Gautam A, Singh R, Singh AK (2019). Roof sagging limit in an early warning system for safe coal pillar extraction. Int J Rock Mech Min Sci, Vol. 123, Article No.104131. (Q1, IF-7.135 and Citations- 7)
- Kumar A**, Waclawik P, Singh R, Ram S, Korbek J (2019). Performance of a coal pillar at deeper cover: Field and simulation studies, Int J Rock Mech Min Sci, Vol. 113, pp. 322-332. (Q1, IF-7.135 and Citations- 20)
- Singh R, **Kumar A**, Singh AK, Coggan J, Ram S (2016). Rib/snook design in mechanised depillaring of rectangular/square pillars, Int J Rock Mech Min Sci, Vol. 84, pp. 119-129. (Q1, IF-7.135 and Citations- 26)
- Ram S, Kumar D, Singh AK, **Kumar A**, Singh R (2017). Field and numerical modelling studies for an efficient placement of roof bolts as breaker line support, Int J Rock Mech Min Sci, Vol. 93, pp. 152-162. (Q1, IF-7.135 and Citations- 20)

- Books/Chapters authored/edited: 01

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

- 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.

- ii. 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.

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

- i. Indigenous design of rib/snook for mechanised depillaring. (Status- Filed, No. 3765DEL2015).
- ii. A method for efficient design of breaker line support in mechanised depillaring. (Status- Filed, No. 0244NF2016).

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

- i. 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.
- ii. Developed an empirical formula to estimate strength, competent area, effective width and width-to-height ratio of irregular shaped rib/snook during mechanised depillaring.
- iii. 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.
- iv. Developed support rock bolt-based goaf edge support for conventional depillaring with stowing
- v. 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:

- i. MEAI-Sitaram Rungta Memorial Award 2019.
- ii. International Travel Support 2018 from SERB.
- iii. First Rank in M.Tech. (CGPA 9.79).
- iv. Trainee Scientist Scholarship for M.Tech.
- v. Qualified GATE 2013 with AIR-89.
- vi. B.Tech. Merit-cum-Means Scholarship (2009-13)
- vii. Second rank in B.Tech. (CGPA 8.35).
- viii. First Prize in X'hibit in METTLE-2011 at IIT BHU.
- ix. Pratibha Samman 2009 from CM of Bihar.
- x. Anand Kumar's Super 30 Scholarship 2008.
- xi. CBSE Merit Certificate for 100% in Maths.
- xii. Guiding three PhD students of NIT Rourkela.
- xiii. Acted as M.Tech. Examiner at IIT (ISM).
- xiv. Signed an MoU with IGN Czech Republic.
- xv. Signed an MoU with SMSL.
- xvi. Treasurer of MGMI Dhanbad Chapter.
- xvii. Visited Czech Republic & USA.
- xviii. Selected as a member of the YLS 2019, SME.
- xix. Recognised as Reviewer of IJMST, JRMGE, JLPPI, AJGS and EEE.
- xx. Acted as Examiner, Verification Officer, Venue Officer in different recruitment drives of CSIR-CIMFR.
- xxi. NCC-B and NCC-C certificate holder.
- xxii. Two Year Diploma in Spanish Language.
- xxiii. One Year Certificate in Statistical Methods
- xxiv. Life Member MEAI, MGMI and SME.
- xxv. Job offers from CSIR-CIMFR, NIRM, SAIL, CIL, Vedanta (Sesa Goa) and Cognizant.

12. Societal Contributions

Our R&D contributions encourages the industry to adopt the underground mining methods for coal extraction which resulted into reduction in disastrous environmental impacts (air and water pollution) on surrounding area, flora and fauna by openpit. It has improved coal quality and production and replaced the intervention of foreign consultant. It has further substituted the import of coal to some extent with saving of foreign reserves and enabled the country to be self-reliant in terms of coal. Also, I am 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. Also, engaged in training miners about mining methods and strata control technologies.