

Brief Bio-data

1. Name: Dr. S. K. Chaulya

2. Date of Birth: 4th January 1969

3. Current Position and Address:

Scientist, CSIR-Central Institute of Mining and Fuel Research, Barwa Road, Dhanbad-826001, Jharkhand, Telefax: 0326–2296045, Mob.: 9471191387, E-mail: chaulyask@cimfr.nic.in

4. Educational Qualifications:

Sl. No.	Degree	Year of Passing	University/Institute	Subject
1	Ph. D.	1997	Indian Institute of Technology (BHU)	Mining Engineering
2	M. Tech.	1993	Institute of Technology (BHU)	Mining Engineering
3	B. Tech.	1991	National Institute of Technol., Karnataka	Mining Engineering

5. Work Experience:

Designation	Institute/company	From	To	Nature of Work
Scientist B	CSIR-CIMFR	16.11.1993	15.11.1998	R&D
Scientist	CSIR-CIMFR	16.11.1998	Till date	R&D

6. Work Area(s)/ Specialization:

Air quality modeling; Environmental impact assessment and management; Preparation of mine plan; Monitoring, control, automation and wireless communication technologies for mines.

7. Major Contributions:

Following technologies have been developed and transferred: (i) Activity-wise emission rate formula for different mines; (ii) Environmental monitoring system for underground mines; (iii) Strata movement warning system for underground mines; (iv) Detecting system for underground mine worker; (v) Road dust collecting and briquetting system; (vi) Wireless information and safety system for underground mines; (vii) Tracking and monitoring system for opencast mines; (viii) Proximity warning device for heavy earth moving machinery; (ix) Integrated strata, gas and environment monitoring system for underground mines; (x) Local methane detector; (xi) Mine transport surveillance system; (xii) Intelligent dry fog dust suppression system; (xiii) Biometric-based exploder; (xvi) Digital mine system using IoT; (xv) Vision enhancement system for foggy weather, etc

8. No. of Research Publications:

- Papers in Journals: 94
- In conference proceedings: 104
- Invited lectures delivered: 7
- List of best 05 publications:

- **Chaulya, S.K.**, Singh, R.S., Chakraborty, M.K. and Dhar, B.B. (1999) “Numerical modelling of biostabilisation for coal mine dump slope”, *Ecological Modelling*, **114**: 275–286., DOI: [https://doi.org/10.1016/S0304-3800\(98\)00157-4](https://doi.org/10.1016/S0304-3800(98)00157-4).
- **Chaulya, S.K.**, Chakraborty, M.K., Ahmad, M., Singh, R.S., Bondyopadhyay, C., Mondal, G.C. and Pal, D. (2002) “Development of empirical formulae for determination of emission rate from various opencast coal mining operations”, *Water, Air, and Soil Pollution*, **140**: 21–55, DOI: <http://doi.org/10.1023/A:1020149407572>.
- **Chaulya, S.K.** (2006) “Emission rate formulae for surface iron ore mining activities”, *Environ. Modeling and Assessment*, **11**: 361–370, DOI:10.1007/s10666-005-9026-2.
- **Chaulya, S.K.**, Trivedi, R., Kumar, A., Tiwary, S.K., Singh, R.S., Pandey, P.K. and Kumar, R. (2019) “Air quality modelling for prediction of dust concentrations in iron ore mines of Saranda region, Jharkhand, India”, *Atmospheric Pollution Research*, **10**(3), 675–688, DOI: <https://doi.org/10.1016/j.apr.2018.11.005>.
- **Chaulya, S.K.**, Chowdhury, A., Kumar, S., Singh, R.S., Singh, S.K., Singh, R.K., Prasad, G.M., Mandal, S.K. and Banerjee, G. (2021) “Fugitive dust emission control study for a developed smart dry fog system”, *Journal of Environmental Management*, **285**, 112116, DOI: <https://doi.org/10.1016/j.jenvman.2021.112116>.
- Books/Chapters authored/edited:
 - Bandyopadhyay, L.K., **Chaulya, S.K.** and Mishra, P.K. (2009) “Wireless Communication in Underground Mines: RFID-based Sensor Networking”, Springer, USA, 477 pp.
 - **Chaulya, S.K.** and Prasad, G.M. (2016) “Sensing and Monitoring Technologies for Mines and Hazardous Areas”, Elsevier, USA, 403 pp.
 - Edited Book Chapters: 7

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

- Development of a road dust collecting system – Sponsored by MoEF&CC;
- Development of tracking and monitoring system using RFID – Sponsored by MeitY;
- Development of tracking system for controlling illegal mining and coal transportation – Sponsored by MeitY;
- Development of digital mine using Internet of Things – Sponsored by MeitY; and
- Development of vision enhancement system for foggy weather – Sponsored by MeitY.

10. (a) Name of Patents/Copyrights Applied/Granted/Commercialized:

Patents:

- Multi-channel intrinsically safe real time environmental monitoring system for underground mines;
- An autonomous control system for shearer-loader in underground longwall mines;
- Strata movement warning system for underground mines;
- Detecting system for underground mine worker;
- Uninterrupted power supply for underground environmental monitoring system;
- Passive amplifier for leaky- feeder based underground communication;
- Portable gas monitoring and power cut-off system for underground mines;
- Induction based shaft communication system;
- Wireless information and safety system for mines;
- Wireless information and safety system for mines;
- Proximity warning device for heavy earth moving machinery;

- Landslide detection and alerting system using wireless sensor network;
- Integrated strata, gas and environment monitoring system for underground mines;
- Mine transport surveillance system;
- Local methane detector;
- A device for 'Directional Illuminated Support Under Harsh Ambience (DISHA);
- Vision enhancement system (VIDHATA);
- Intelligent dust suppression system for mining applications;
- Biometric-based exploder;
- Biometric-based theft control device for motor bikes;
- Automatic headlamp dimming device;
- Intrinsically safe digital fuel meter;
- Blocks and sand manufacturing process using mine wastes;
- Digital mine using Internet of Things;
- Portable weather and environmental monitoring system;
- Retractable bed cover and dust collector for transport vehicles;
- Slope stabilization and monitoring technique using geo-synthetic concrete cement mat and IoT devices; etc.

Copyrights:

- Data Acquisition Software (DAS) for environmental monitoring, SW-1555/2004;
- Autonomous Control of Shearer Motor (AUTOCSM), SW-2485/2005;
- Miners' Tracking software (MineTrack), SW-4500/2010;
- Wireless Sensor Network (WSN) software, SW-4501/2010;
- RFID Device Program (RDP), 036CR2008;
- Landslide Monitoring and Prediction Software (LandMAPS), L-54265/2013;
- Digital Mine (DM) software, SW-13978/2020;
- Mine Environment Monitoring and Prediction (MEMP) software, SW-13980/2020;
- Real-time image processing method and software, 015CR2020;
- Method and software for real-time image stitching and object detection, SW-13959/2020;
- Integrated rural facilitation software (Gramin Mitra), SW-13961/2020;
- Soil and water health reporting software, SW-13961/2020;
- Gramin E-Bazar software, SW-14135/2021; etc.

(b) Technologies/Products /knowhow/Services developed: As mentioned in SI No. 7.

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

- Whitaker Golden Jubilee Award, 1997;
- MEAI-NMDC Award, 2017;
- Merit Certificate for CSIR Technology Award, 2018;
- Awards for filing patents and publications; etc.

12. Societal Contributions:

- Management of air pollution for the people living in mining areas;
- Reclamation of mine waste dumps for the benefit of the society;
- Implementation of various schemes sponsored by MeitY for improving livings of scheduled caste people; etc.