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1. Name: **Dr. Manoj Namdeo Bagde**

2. Date of Birth: **01.04.1970**

3. Current Position and Address: **Principal Scientist**

CSIR-CIMFR, Unit 1, 3rd Floor, MECL Bhavan, Seminary Hills,
Nagpur 440006 (M.S.) India.

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4. Educational qualifications: (Graduation and above)

Sl. No.	Degree/ Certificate	Year of Passing	University/ Institute	Subjects
	B. E.	1993	VRCE Nagpur	Mining Eng.
	M. Tech	1994	IIT Delhi	Rock Mechanics
	Ph. D.	2004	VSB-TU, Ostrava Czech Republic	Mining Geo-mechanics

5. Work experience

Designation	Institution	From	To	Nature of work
Scientist	CSIR-CIMFR	29.03.1996	Till date	R & D & consultancy services in the area of Rock Mechanics & Mining Technology, Strata control & Instrumentation, Mine roadways and Tunnel support design, Stabilization of old rock structures including railways, tunnels & Ancient caves etc.
Visiting Fellow	McGill Un. Canada	07/2010	07/2011	Worked on a research scheme "Analysis of Backfill Failure into Adjacent Stope" under BOYSCAST Fellowship of DST, GOI.
Ph. D. Scholar	VSB-TU, Ostrava	02/2002	06/2004	Worked upon "Behaviour of Rocks in Uniaxial Compression under Dynamic Cyclic Loading" leading to Ph. D

6. Area of specialization: **Rock Mechanics & Mining Technology, Strata Control & Instrumentation, Mining Methods & Ground Support, Rock Structure Stabilization including tunnels and caves, Backfill designing in hard rock mining & Rock Fatigue etc.**

7. Honors/Awards received:

1. Received **best paper award** from ISRMTT to paper entitled "Boulder characterization and stabilization at Ajantha Caves: A Study" authored by Dr. MN Bagde, Sri Nasim Sheikh and Dr. AK Soni and published in INDOROCK 2013: 4th Indian Rock Conference under the category "Applications of Rock Mechanics in Hill Development and River valley Projects" for the year 2013.

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2. **Member on International Advisory Committee:** ISMS2016-3rd Int. Symp. on Mine Safety Science and Engineering to be held at Montreal, Canada during August 13-18 2016 and hosted by McGill Un.
 3. **Chaired the Session** on Underground Space and Technology: ARMS8-2014 ISRM Int Symp -8th Asian Rock Mechanics Symposium-Rock Mechanics for global issues-National Disasters, Environment and Energy , Organized by The Japanese Committee for Rock Mechanics (JCRM) - Japan National Group for ISRM, Sapporo, Japan during 14-16 Oct, 2014.
 4. **Member on Technical Committee & Chaired Session on Mining:** INDOROCK 2014-5th Indian Rock Conference: Underground Construction for Hydropower, Mining & Infrastructure, Organized by ISRMTT in association with CWC & CSMRS N. Delhi, 12-14 Nov 2014.
 5. **Member on Technical Committee:**1st National Mining Summit on “Challenges before Mining Industry for Sustainable Development” Organized by VNIT Mining Alumni Association in association with AMEEX Technologies, USA, RGCERT Chandrapur, BIT Ballarpur, CSIR-CIMFR, . Dept of Mining Eng –VNIT, Miner’s Alliance & VIDC Nagpur, 22-23 Nov 2014.
 6. On **Editorial Board** of Dataset Papers in Geology, Hindawi Publishing, Jr Material sciences & Application-American Association for Science & Technology (AASCIT), Material Science Express & Geo-express Jr. (Global Scientific Inc).
 7. **Reviewer** – International Journal of Rock Mechanics and Mining Sciences (Elsevier Publications), Int. J. Mining Science & Technology (Elsevier Publications), Engineering Geology (Elsevier Publications), Rock Mechanics and Rock Eng (Springer publ.), International Journal of Geosciences (Scientific Research Publication, USA), Journal of Civil Eng. & Construction Tech. (JCECT) (Academic Journals) & ACTA (Czech Academy Jr.) etc.
8. Fellowships/Scholarships:
1. **BOYSCAST Fellowship** of DST, Govt. of India for the year 2009-10 to carry out research at McGill Un., Canada during the period 2010-2011.
 2. **Czech Govt. Scholarship** during the period 2002-2004 to pursue Ph. D. at VSB-Technical University, Ostrava, Czech Republic.
9. No. of Research Publications:
- Papers in journals: International Jr. of Repute : **8**, National Jr. : **7**
 - In conference proceedings: International Conf. of Repute : **15**, National/Int. Conf. : **35**
 - Invited/key-note addresses: **3**
 - List of best 05 publications:
1. **Bagde M. N.** (2016). Characterization of failure modes and planned stabilization measures for the Ajanta Caves in India. Int. J. Rock Mechanics & Mining Sciences, 81, 12-18.
 2. **Bagde M. N.**, Petros V. (2009). Fatigue and dynamic energy behavior of the rock subjected to cyclical loading. Int. J. Rock Mechanics & Mining Sciences, 46, 200-209.(Cited by 45).
 3. **Bagde M. N.**, Petros V. (2005). Fatigue properties of intact sandstone samples subjected to dynamic uniaxial cyclical loading. Int. J. Rock Mechanics & Mining Sciences, 42, 237-250. (Cited by 105).
 4. **Bagde M. N.**, Petros V. (2005). Waveform effect on fatigue properties of intact sandstone in uniaxial cyclic loading. Rock Mechanics & Rock Engineering, 38 (3), 169-196. (Cited by 25).
 5. **Bagde M. N.**, Raina A. K., Chakraborty A. K., Jethwa J. L. (2002). Rock mass characterisation by fractal dimensions. Engineering Geology, 63(1-2), 141-155. (Cited by 36).

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10. Number of Books authored/edited:

Bagde M. N. & Tiwari M. S. (Editors). Proc. of the National Technical Meet on “Advances in Mining Technology” October 1-2, 2011, VNIT Nagpur, Organized jointly by VNIT Mining Alumni Association and VNIT, Nagpur.

11. (a) No. of Patents granted/applied for: **NOT APPLICABLE**

(b) Technologies developed, Licensed and/or commercialized: **NOT APPLICABLE**

12. Foreign visits:

1. Czech Republic during Feb 2002 to June 2004 to pursue Ph. D. under Czech Govt. Scholarship
2. Visited McGill University, Canada during July 2010 to July 2011 under BOYSCAST fellowship programme sponsored by DST Govt. of India.
3. Visited Hong Kong & Hong Kong University to attend and present a paper at SINOROCK 2009 in the month of May 2009.
4. Visited Australia during November 2012 to attend & present a paper at ICGI 2012 Conference organized by Wollongong University. Also visited: Wollongong University-Wollongong, Queensland University & CSIRO Australia at Brisbane.
5. Visited Japan during October 2014 to attend & present a paper at ARMS 8 –ISRM Int. Symp. & 8th Asian Rock Mechanics Symp held during 14-16 Oct. 2014 at Sapporo, Japan. Also visited Hokkaido University at Sapporo and made presentations.

13. Details of Professional memberships:

1. Member –International Soc for Rock Mechanics
2. Life Member-Indian Soc for Rock Mechanics & Tunnelling Technology (ISRMTT)
3. Life Member- Indian Geotechnical Society (IGS)
4. Life Member- The Institution of Engineer’s (I)
5. Life Member- The Mining, Geological & Metallurgical Institute of India (MGMI)
6. Life Member- Mining Engineers’ Association of India

14 . Major contributions: (Max. 150 words)

1. Through his research work leading to Ph.D. on **"Behaviour of Carboniferous Rocks in Uniaxial Compression under Dynamic Cyclic Loading"** awarded Ph. D. degree in June 2004 by VSB-Technical University of Ostrava, Faculty of Mining & Geology, Institute of Mining Engineering & Safety: *The insight gained provided major contributions into understanding how dynamic cyclic loading, in terms of loading frequency and amplitude, resulted in the degradation of material strength leading to failure. The correlation of these findings to in situ observations will allow for the improved assessment of damage and excavation stability in rock burst prone rocks. The findings from this thesis work can be utilized in the area of prognosis and preventive measures to prevent rock burst hazards in coalmines.*
2. Worked on a research scheme **"Analysis of backfill failure into adjacent stopes"** under BOYSCAST Fellowship sponsored by DST-Govt. of India at Dept. of Mining and Materials Eng., McGill University, Montreal, Canada: *The research study carried out suggested that backfill strength as well as stope geometry, and mining sequence influences the backfill failure. Case and numerical modelling studies demonstrated the role of the above parameters on backfill dilution and failure. The study also illustrated the relationship between measured backfill failure, stope geometry and other mining parameters and the consideration of blast induced damage in backfill design.*
3. Worked on a Research Scheme entitled **"Estimation of Rock Mass Strength and Modulus based on Fractal Approach"** Sponsored by Ministry of Water Resources, Govt. of India: *Developed rock mass classification system as well as estimation of rock mass strength & modulus based on fractal dimensions using image analysis technique. The data collection procedure for rock mass characterization & estimation of rock mass parameters in rock excavation engineering requires considerable field study and laboratory work. Such a characterization necessitates fieldwork that requires sufficient rock exposure in order to obtain an adequate number of data, time and considerable cost. Often, the end result is person-*

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specific. Fractal analysis techniques can help in overcoming the above difficulties equally well or better than other techniques.

4. **Designing stoping operations in the case of thick and wide orebody at Kandri mine of M/S MOIL Ltd.:** *With the applications of rock mechanics and various empirical approaches applicable and in vogue for rock mass classification and stoping design in the case of hard rock mines and with the latest tool of numerical modeling –feasible and most economical Room-and-Pillar mining with Post pillar is being recommended in diverse mining and complex geological conditions.*
5. **Instrumentation and data analysis of the strain bars installed at 10th and 11th Level at Bhalaghat mine of M/s MOIL Ltd :** *With the help of detailed instrumentation and its data analysis and application of various approaches available and numerical modeling tool, level interval is recommended to 45 m from the present one at 30m to enhance production and productivity with due consideration of the economy and safety.*
6. **Stabilization of ancient world heritage sites, caves and monuments:** *Studies carried out at Historic UNESCO World Heritage Monument at Ajantha Caves helped in planning stabilization measures to be undertaken considering safety of the ancient caves as well as visitors and site personnel's.*
7. **Feasibility and application of bio-fuel as well as low cost and diluted ANFO for cost effective and safe blasting practices in opencast metalliferrous mines In India.** *Sponsored by Ministry of Mines, Govt. of India: Will help mining industry to replace costly diesel used in ANFO blasting as one of the main constituent with alternative cheaper & green Bio-fuel.*

15. Technologies and Products/ Services: **NOT APPLICABLE**

- (i) Developed:
- (ii) Licensed:
- (iii) Commercialized:

16. Designs and Prototype Developed: **NOT APPLICABLE**

17. Honours and awards won for technological contributions or sociological impact of R&D:

1. Total Citations to his publications stands at more than 250 and Hi10 index is at 5. One of the publication citation stands at more than 100.
2. On Editorial Board of Jr Material sciences & Application-American Association for Science & Technology (AASCIT) & Dataset Papers in Geology (Hindawi Publishing), Material Science Express & Geo-express Jr. (Global Scientific Inc).
3. Paper setter & Evaluator –Rashtrasant Tukdoji Maharaj Nagpur University & Gondwana University, Gadchiroli.
4. Invited reviewer: CMSE 2015 – 4th Int Conf on Material Science & Eng & CEUP 2015 – Civil Eng & Urban Planning
5. Reviewer: Rock Mechanics, Mining & Material Science Jrs published by Elsevier Publ., Springer Publ., including many others.
6. Honorary selection & inclusion: “2000 outstanding intellectuals of the 21st Century -9th Ed”; “The Cambridge certificate for outstanding engineering achievement”; “Top 100 Professionals-2015” (all by IBC, Cambridge, England), “Who’s Who in the World 2016-33rd Ed”, “Bharat Jyoti Award” by India Int Friendship Soc, N Delhi, and “Best Citizens of India” by Int. Publ House, N Delhi.
7. Nominated Member on Research Monitoring Committee (Mining Eng) of Rajiv Gandhi College of Eng, Research & Technology, Chandrapur (MS)

Signature