Brief Bio-data

1. Name: Dr. Debadutta Mohanty

2. Date of Birth: 10th March 1978

3. Current Position and Address (Include Email ID and Contact Number)

Principal Scientist & Head (CBM & GHG)
Nonconventional Gases Research Group
Associate Professor, AcSIR
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4. Educational Qualifications:

Sl. No.	Degree	Year of Passing	University/Institute	Subject
1	B. Sc.	1998	Ravenshaw University, Cuttack	Geology (Hons), Mathematics, Physics
2	M. Sc. Tech.	2001	IIT (ISM) Dhanbad	Applied Geology
3	Ph. D.	2008	IIT Roorkee	Earth Sciences

5. Work Experience:

Designation	Institution	From	To	Nature of work
1. Scientist 'B'	CSIR-CIMFR	2005	2008	R&D
2. Scientist 'C'	CSIR-CIMFR	2008	2012	R&D
3. Senior Scientist*	CSIR-CIMFR	2012	2016	R&D
4. Prinipal Scientist	CSIR-CIMFR	2016	Cont.	R&D
*Post Doctoral	Southern Illinois University at Carbondale, USA	2008	2009	R&D

6. Work Areas/Specialization:

Dr. Mohanty has expertise in petrologic (coal/ore), geochemical (organic/inorganic) and petrophysical (coal/rock) studies with application to basin analysis; reservoir evaluation for coalbed methane (CBM) and CO_2 sequestration in geologic formations; coal beneficiation; coal conversion processes such as combustion, gasification including underground coal gasification (UCG), carbonization, liquifaction etc. and; ore geology and mineral exploration.

7. Major Contributions:

The contributions of Dr. Mohanty may be categorized broadly in four aspects: fundamental studies in fuel science with application to genesis of hydrocarbons and coal conversion processes; classification and codification of fuels resources; coal

reservoir evaluation through petrological and petrophysical studies, and simulation for various field applications; estimation of GHG emissions from fossil fuel utilization and its mitigation. He is the lead scientist for preparation of fugitive emission estimates from fossil fuels on behalf of MoEFCC as part of national communication to UNFCCC and is one of the expert reviewers of Sixth Assessment Report (AR6) of IPCC WGIII. He had also held visiting positions at the Southern Illinois University at Carbondale, Ergo Exergy Inc. Montreal, Canada and The University of Queensland, Australia.

He is closely involved in different industry funded projects on gas-in-place estimation, sorption isotherm construction and reservoir evaluation for oil and gas companies; mine gassiness study and C-footprint study for coal mines, and prefeasibility study for UCG. He had done extensive sorption study on coal/shale reservoirs of India and developed a reservoir evaluation technique to capture the regional variation in reservoir properties and to simulate the CBM well performance. He is keen in investigation on organic maturation, gas generation, cleat/micro-fractures and storage capacity of coal/shale reservoirs. He had addressed to the much debated issue of Palaeozoic marine incursion in the Indian Peninsular through petrographic investigation. He contributed to the prediction of optimum blend proportion and coke quality for metallurgical usage.

8. No. of Research Publications:

- Papers in Journals: 19
- In conference proceedings: 40
- Invited lectures delivered: 10
- List of best five publications:
  1. Choudhury N., **Mohanty D.**, Boral P., Kumar S., Hazra S. K. (2008). Microscopic evaluation of coal and coke for metallurgical usage: A case study. Current Science, 94-1: 74-81.
  2. Bandopadhyay A. K. and **Mohanty D.** (2014). Variation in hydrogen content of vitrinite concentrates with rank advance. Fuel, 134: 220-225.
  3. **Mohanty D.** , Chattaraj S., Singh A. K. (2018) Influence of coal composition and maturity on methane storage capacity of coals of Raniganj Coalfield, India. International Journal of Coal Geology, 196: 1-18.
  4. Chattaraj S., **Mohanty D.**, Kumar T., Halder G., Mishra K. (2019) Comparative study on sorption characteristics of coal seams from Barakar and Raniganj formations of Damodar Valley Basin, India. International Journal of Coal Geology, 212: 103202, 1-19.
  5. Chattaraj S., Upadhyay R., **Mohanty D.**, Halder G., Kumar T. (2021). Evaluating production behaviour of CBM wells from Raniganj Coalfield through reservoir characterization under constrained field data conditions. Journal of Natural Gas Science and Engineering, 92: 103969, 1-20.
- Books/Chapters authored/edited: 7 book chapters, 3 edited proceeding volumes

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

1. Investigation on *in situ* gas content, sorption characteristics, petrographic and chemical makeup, and gas quality of the coal cores retrieved from CBM production wells drilled in Bokaro Patch#A and Patch#B of ONGC - Funded by ONGC, Bokaro

[2] Preparation of GHG emission estimates associated to fugitive emissions from coal mining and handling activities and oil and natural gas systems - Funded by MoEFCC, Govt. of India

[3] Role of coal composition and maturity on the sorption behavior of Indian coals for gas storage estimation – Funded by SERB, DST, New Delhi

[4] Development of Underground Coal Gasification Technology in India (CoalGasUrja) - Funded by CSIR XII FYP Network Project

[5] Feasibility study for recovery and utilization of coal mine methane in Jharia, Bokaro and Raniganj coalfields in India - Funded by US EPA

10. Technologies/Knowhow/Services developed:

- Developed high pressure adsorption isotherm setup for investigating on deep unconventional gas reservoirs and CO_2-sequestration
- *In situ* gas content measurement technique and gas-in-place estimation
- Reservoir evaluation through petrologic, chemical, and petrophysical studies
- Greenhoue gas (GHG) estimation techniques

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

Honors/Awards

- K. N. Sinha award-2019 for highest impact factor paper published in SCI Journals

Recognitions/Fellowships/Scholarships

- Fellow and Life Member; Geological Society of India (GSI)
- CSIR- NET-JRF/SRF (2002-05)
- GATE-March 2001
- ISM/UGC Scholarship (1998-2001)
- National Scholarship (1993-1998)

Professional Membership

- Alternate Member (PCD:7.5); Bureau of Indian Standards for Coal Petrology (BIS)
- Life Member; Indian Science Congress Association (ISCA)
- Life Member; Indian Institute of Mineral Engineers (IIME)
- Life member; The Mining, Geological and Metallurgical Institute of India (MGMI)
- Life member; Mining Engineers' Association of India (MEAI)

12. Societal Contributions

Methane, a potent greenhouse gas (GHG), occurs in inherent association with coal and released to the atmosphere during coal mining operations. Tapping this methane as a cleaner source of energy helps in making coal mining safer while stabilizing its atmospheric concentrations to avoid climate change consequences. Hence, his research has direct relevance to the larger society.

Dr. Mohanty had also organized various outreach programmes for executives of coal, oil and gas, and power utility companies, trained many graduate/post-graduate students and supervised several M.Tech./Ph.D. theses on topics related to coal petrology, CBM, CO_2 sequestration, UCG, GHG etc. thereby significantly contributing to the human resource development.

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