CURRICULUM VITAE

Name: : **MRUGANKA KUMAR PANIGRAHI**

Date of Birth : 10th April, 1964

Present Position : Professor of Geology (Higher Administrative Grade)

Address for communication : Department of Geology & Geophysics, I.I.T., Kharagpur
(WB) India 721302
e-mail: mkp@gg.iitkgp.ernet.in Fax: +91-3222-255303/282268

Education: : Ph.D. (IIT Kharagpur) 1992

Title of Ph.D. thesis : **Copper-molybdenum mineralization and associated granitoids at Malanjkhand, M.P., India**

Awards/Honors/Distinction : I) Awarded with Prof. N.N.Chatterjee Medal by the **Asiatic Society** for conspicuously important contribution to Economic Geology, 1993
II) **Young Scientist Project Award, 1993**, Department of Science & Technology, Government of India.
III) Indian Society of Applied Geochemists Medal, 2011

Extracurricular distinction President's Scout

Career chronology (teaching and research)

1. August 2015 – present	: Professor of Geology (HAG), IIT Kharagpur
2. Feb 2009- July 2015	: Professor of Geology, I.I.T., Kharagpur
3. August 2004 to January 2009	: Associate Professor of Geology, IIT Kharagpur
4. Feb.1998 to July, 1994	: Assistant Professor of Geology, I.I.T., Kharagpur
5. Aug. 1995 to Feb. 1998	: Visiting Lecturer in Geology, I.I.T., Kharagpur
6. Dec. 1993 to July 1995	: Lecturer in Geology, University of Allahabad, India
7. April, 1992 to Nov. 1993	: Research Associate (C.S.I.R., Ministry of HRD, Gov. of India) affiliated to Jadavpur University, Calcutta, India (associated with a book-writing project – Ore Genesis: A Holistic Approach by A. Mookherjee, Allied Pub., New Delhi, 1999)

Broad Area of Specialization : **Ore Geology & Geochemistry**

Fields of Expertise : Ore Petrography, Fluid Inclusion Studies, Laser Raman Microspectrometry, Aqueous Geochemistry and Mineral-fluid Equilibria, Granite Pterogenesis, Modelling and Simulation; Mineral Economics and Exploration, Analytical Geochemistry

Research Grants : Total 9 sponsored projects (from various Governmental Agencies amounting to amounting to approximately 18 million INR)

Facilities Developed / Managed : Fluid Inclusion Microthermometry, Laser Raman and FTIR Spectrometry; LA ICP MS, Ion Chromatography; X-Ray Fluorescenec Spectrometer (Instrumental in development of facilities worth 30 million INR through Governmental Funding)

Research guidance : Twenty-two Completed; Four ongoing

Teaching

Graduate level *:* Mineral Exploration; Analysis of Geological Data, ; Pattern Recognition in Geosciences; Instrumental Methods of Analysis; Water-rock interaction

Undergraduate Level : Mineral Resources, Modeling and Simulation of Geological Processes

Number of M.Sc. theses guided : 34

Number of M.Tech. thseses guided : Six

Conferences Organized *:* **Organized an international conference on Fluid Inclusions (ACROFI-2) (Second Meeting of the Asian Current Research on Fluid Inclusions, Nov 12 – 14, 2008)**

Short Courses Organized : DST, Govt of India sponsored short course on "Fluid Inclusions in Minerals: Methodologies, practice and applications", 2002

Membership in professional bodies : Member, Society for Geology Applied to Mineral Deposits (SGA); Life Member: SGAT, Life Member, Min. Soc. India; Member, Society of Resource Geology, Japan

Editorial Board *:* **Associate Editor, Resource Geology, (Wiley)**

Contribution to Outreach Programs *:* Online Course (NPTEL – MOOC) on 'Mineral Resources : Geology, Exploration, Economics and Environment' (https://www.youtube.com/results?search_query=mineral+resources+iit+kharagpur)
:Online course (NPTEL – MOOC) on 'Fluid Inclusions in Minerals : Principles, Methodology, Practice and Applications (https://www.youtube.com/watch?v=iqecwuoaFvs&list=PLbRMhDVUMngdq9b2BduR9XwjWsAgflrQa)

Visits Abroad *:* 1. Geological Survey of Japan, Deceember, 2007 (two weeks)
2. Institute of Mineral Resources, Chinese Academy of Geological Sciences, Bejing, 2019 (two weeks)

Invited Lectures Abroad

1. Geological Survey of Japan : December, 2007 : Title : The Paleoproterozoic granitoid complex and associated copper minerallization at Malanjkhand, Central India – A working model of ore genesis.
2. Geoscience Australia : August, 2009 Title :
3. Institute of Mineral Resources, Chienese Academy of Geological Sciences : December, 2019. Title : Metallogeny of Precambrian granitoids in India.

Invited Lectures in India

1. Geological Survey of India, Nagpur, 2011 : Title – Precambrian granite-related ore systems and potential targets for future eploration.
2. Wadia Institute of Himalayan Geology, Dehradun : Title : Research on Ore Geology in India : Which way we go ??
3. Banaras Hindu University (ISAG Award Acceptance Lecture), 2011 : Title – Towards understanding the Malanjkhand copper deposit.
4. TOPAS IIT Kharagpur 2017. Title – Numerical modelling of subduction of lithospheric plates : A critical appraisal of the methodology
5. DST sponsored Training Program (STUTI), IIT (ISM) Dhanbad : Title : X-ray Fluorescence Spectrometry for Geological Applications.
6. Webinar and Online Training Program on Raman Spectroscopy (Organized by CRF, IIT Kharagpur and Horiba), 2021. Title : Applications of Raman spectroscopy in Geology.

Examiner of Ph. D. Theses :

IIT(ISM) Dhanbad, Utkal University, Goa University, Visva Bharati University, IIT, Roorkee

Revewer of International Journals :

Precambrian Research, Mineralium Deposita, Resource Geology, Continental Shelf Research, Marine Pollution Bulletin, Ore Geology Reviews, Geological Journal, Journal of Asian Earth Sciences, Journal of Geochemical Exploration, JESS, Curr. Sci.,

Academic Services :

- Paper Setter / Convener / Chief Paper Setter / Evaluator in JAM and GATE
- Member of Instutute Curriculum Revision Comittee, 2008, 2019

Other Services

Served as the Convener, Audience & Particpants Management Committe of Annual Convocation of IIT Kharagpur for 11 years (2002 and 2006 – 2015)

Academic Services to other Organizations

- *Imparted training on Fluid Inclusion Microthermometry to officers of the Geological Survey of India at Bangalore (2006)*
- *Imparted training on Fluid Inclusion Microthermometry to Scientists of the Atomic Minerals Directorate of Exploration and Research, New Delhi (2011)*
- *External Reviewer of Projects, Geoogical Survey of India*
- *Resource persion* In: DST Sponsored Contact Programme on *Chemical Thermodynamics & its application to Petrological Problems* Jadavpur University, 30 Oct. – 17 Nov, 2000
- *Resource person in* DST Advanced Training Programme on Mineral Deposit Modeling, Department of Geology, Jammu University, 2006
- *Member, Research Advisory Committee, Wadia Institute of Himalayan Geology, Dehradun (one term of three years)*

Major Academic Responsibilities

- **Vice-Chairman JEE (Advanced), 2013**
- **Organizing Chairman JEE (Advanced), 2014**
- Chaired the Committee from IIT Kharagpur for Development and Validation of the Joint Seat Allocation Process of IITs, NITs and other CFTIs, through JEE (Main) and JEE (Advanced), 2015

Other Institute Responsibilities

- Professor-in-Charge, Institue Guest Houses, (Sep. 2014- Feb. 2016)

- Warden, Patel Hall of Residence (2009-2011)
- Coordinating Warden, Maintenance, HMC (2011-2012)
- Traesurer, Technology Student's Gymkhana, 2008-2011
- Member, Senate Appointed Library Committee
- Member, Senate Appointed Malpractice Committee

List of Publication of M. K. PANIGRAHI

(Scopus Citations:1405; h-index – 20; Google Scholar Citations: 2081, h-index – 25)

1. Dobe R, Vukmanovic Z, Bose N, Panigrahi MK, Gupta S (2022) Origin of magmatic and tectonic fabrics in the Remal granite-gneiss, Singhbhum Craton, India. *Geol. Magazine*, https://doi.org/10.1017/ S0016756822000486
2. Rout, D, Panigrahi MK, Mernagh TP and Pati JK (2022) Origin of the Paleoproterozoic 'Giant Quartz Reef' system in the Bundelkhand Craton, India: Constraints from fluid inclusion microthermometry, Raman spectroscopy and geochemical modelling. *Lithosphere*, (Special 8), 3899542
3. Ravichandran M, Gupta Anil K, Mohan K, Tiwari Sameer Lakshumanan K, C, Panigrahi MK (2022) Indian monsoon variability during the past~ 8.5 cal kyr as recorded in the sediments of the northeastern Arabian Sea. *Quaternary International*, (https://doi.org/10.1016/j.quaint.2022.03.016)
4. Behera S and Panigrahi MK (2022) Gold prospectivity mapping and exploration targeting in Hutti-Maski schist belt, India: Synergistic application of Weights-of-Evidence (WOE), Fuzzy Logic (FL) and hybrid (WOE-FL) models. *J. Geochem. Explor*., 235, 106963
5. Behera S and Panigrahi MK (2021) Gold prospectivity mapping in the Sonakhan greenstone belt, Central India: A Knowledge-driven guide for target delineation in a region of low exploration maturity. *Nat. Resources Research*, 30, 4009 - 4045
6. Behera S and Panigrahi MK (2021) Mineral prospectivity modelling using singularity mapping and multifractal analysis of stream sediment geochemical data from the auriferous Hutti-Maski schist belt, S. India. *Ore Geol. Reviews*, 131, 104029
7. Bali H, Gupta AK, Mohan K, Thirumalai K, Tiwari SK, Panigrahi MK (2020) Evolution of the Oligotrophic West Pacific Warm Pool During the Pliocene-Pleistocene Boundary, *Paleoceanography and Paleoclimatology* 35 (11)
8. Gupta A, Dutta A, Panigrahi MK, Sar P (2020) Geomicrobiology of mine tailings from malanjkhand copper project, India, *Geomicrobiology Journal*, 1-18
9. P Saravanan, AK Gupta, H Zheng, J Majumder, MK Panigrahi, A Kharya (2020) A 23000-year-old record of paleoclimatic and environmental changes from the eastern Arabian Sea. *Marine Micropaleontology* 160, 101905.
10. Saravanan P, Gupta AK, Zheng H, Rai SK, Panigrahi MK (2020) Changes in deep-sea oxygenation in the northeast Pacific Ocean during 32–10 ka. *Geophysical Research Letters* 47 (11), e2019GL086613.
11. Saravanan P, Gupta AK, Zheng H, Panigrahi MK, Tiwari SK, Rai SK, Prakasam M (2020) Response of shallow-sea benthic foraminifera to environmental changes off the coast of Goa, eastern Arabian Sea, during the last~ 6100 cal yr BP, *Geological Magazine* 157 (3), 497-505.
12. Saravanan P, Gupta AK, Zheng H, Panigrahi MK, PrakasamM (2019) Late Holocene long arid phase in the Indian subcontinent as seen in shallow sediments of the eastern Arabian Sea. *Journal of Asian Earth Sciences* 181, 103915.
13. Behera S., Panigrahi MK and Pradhan A (2019) Gold Favourability Mapping With Stream Sediment Geochemical Data in the Sonakhan Greenstone Belt, Central India: A Combined Concentration Area Fractal and Fuzzy AHP Approach., *Applied Geochemistry*, 107, 45-57

14. Pandit D., Bhattacharya S. and Panigrahi MK (2019) Dissecting through the metallogenic potentials of older granitoids-case studies from Bastar and Eastern Dharwar cratons India. *Geological Society, London, Special Publications* 489, SP489-2019-342
15. Niyogi A, Pati JK, Panigrahi MK, Panda D, Chakarvorty M Parthasarathy, G (2018) Raman, Infrared, and Chemical Characterization of Fly Ash-Generated Spherules. *J. Applied Spectroscopy*, 85, 856 – 863
16. Gupta Abhishek, Dutta Avishek, Sarkar Jayeeta, Panigrahi M. K., Sar Pinaki (2018) Low-Abundance Members of the Firmicutes Facilitate Bioremediation of Soil . *Frontiers in Microbiology*, v9, 2882
17. Gude Venkatesh, Rout Duttanjali , Panigrahi M.K. Biradha Kumar (2018) Origin of green photoluminescence in four-ring bent-core molecules with ESIPT, selective sensing of zinc ions by turn-on emission and their liquid crystal properties. *Photochemical and Photobiological Sci*., 17, 1386 - 1395
18. Bhattacharya S, Panigrahi MK (2017) Volatiles associated with granitoid intrusives around orogenic gold deposits in Ramagiri and Penakacherla regions of Eastern Dharwar Craton, South India. *Journal of the Geological Society of India* 90 (5), 569-576
19. Sahoo PK, Tripathy S, Panigrahi MK, Equeenuddin SM (2017) Anthropogenic contamination and risk assessment of heavy metals in stream sediments influenced by acid mine drainage from a northeast coalfield, India. *Bulletin of Engineering Geology and the Environment* 76 (2), 537-552
20. Gupta A, Dutta A, Sarkar J, Paul D, Panigrahi MK, Sar P (2017) Metagenomic exploration of microbial community in mine tailings of Malanjkhand copper project, India. *Genomics Data* 12, 11-13
21. Acharya SS, Panigrahi MK (2016) Evaluation of factors controlling the distribution of organic matter and phosphorus in the Eastern Arabian Shelf: A geostatistical reappraisal. *Continental Shelf Research.* 126, 79-88
22. Acharya SS, Panigrahi MK (2016) Eastward shift and maintenance of Arabian Sea oxygen minimum zone: Understanding the paradox. *Deep Sea Research Part-1*, 115, 240-252
23. Acharya SS, Panigrahi MK, Kurian J, Gupta AK and Tripathy S. (2016) Speciation of phosphorus in the continental shelf sediments in the Eastern Arabian Sea. *Continental. Shelf Research*. 115, 65 - 75
24. Acharya SS, Panigrahi MK, Gupta AK and Tripathy S. (2015) Response of trace metal redox proxies in continental shelf environment: the eastern Arabian Sea scenario. *Continental. Shelf Research*. 106, 70-84
25. Bhattacharya S and Panigrahi MK (2015) Source of ore fluid in lode gold deposits of Eastern Dharwar Craton; An intricate issue. *J. of the Ind. Inst. Sci*., 95, 201-208
26. Arumugm, Yuvaraja; Gupta, Anil K.; Panigrahi, M K (2014) Species diversity variations in Neogene deep-sea benthic foraminifera at ODP Hole 730A, western Arabian Sea. *Jour Earth System Science*, 123, 1671-1680
27. Bhattacharya S and Panigrahi MK (2014) Oxygen isotope ratio of quartz veins from the Ramagiri-Penakacherla schist belts and surrounding granitoids in the Eastern Dharwar Craton: A case for a possible link between gold mineralization and granite magmatism. *Ore Geol Rev*, 63, 201-208

28. Nanda JB, Panigrahi MK and Gupta S (2014) Fluid inclusion studies on the Koraput Alkaline Complex, Eastern Ghats Province, India: Implications for mid-Neoproterozoic granulite facies metamorphism and exhumation. *J. Asian Earth Sci*., 82, 10-20
29. Sahoo P, Tripathy S., Panigrahi MK and Equeenuddin Sk Md (2014) Geochemical characterization of coal and waste rocks from a high sulfur bearing coalfield, India: Implication for acid and metal generation. *J. Geoch. Expl*., 145, 135-147
30. Pati JK, Panigrahi MK and Chakraborty M (2014) Granite-hosted molybdenite mineralization from Archean Bundelkhand craton-molybdenite characterization, host rock mineralogy, petrology, and fluid inclusion characteristics of Mo-bearing quartz. *Jour Earth System Science*., 123, 943-958
31. Bhattacharya S and Panigrahi MK and Jayananda M (2014) Mineral thermobarometry and fluid inclusion studies on the Closepet granite, Eastern Dharwar Craton, south India: Implications to emplacement and evolution of late-stage fluid. *J. Asian Earth Sci*., 91, 1-18
32. Pandit, Dinesh; Panigrahi, M K.; Moriyama, T. (2014) Constrains from magmatic and hydrothermal epidotes on crystallization of granitic magma and sulfide mineralization in Paleoproterozoic Malanjkhand Granitoid, Central India. *CHEMIE DER ERDE-GEOCHEMISTRY*, 74, 715-733
33. Pandit D, Panigrahi MK, Moriyama, T and Ishihara S (2014)A comparative magnetic susceptibility, geochemical and fluid inclusion studies on the Paleoproterozoic Malanjkhand and Dongargarh granitoids, Central India and implications to metallogeny. *Mineral. Petrol*., 108, 663-680
34. Sahoo PK, Panigrahi MK and Tripathy S, Equeenuddin, SM (2013) Inhibition of Acid Mine Drainage from a Pyrite-rich Mining Waste Using Industrial By-products: Role of Neo-formed Phases. *Water Air and Soil Pollution*, 224, 1-11
35. Sahoo, P. K., Tripathy, S., Panigrahi, M. K. Equeenuddin Sk. Md. (2013) Evaluation of the use of an alkali modified fly ash as a potential adsorbent for the removal of metals from acid mine drainage. *Applied Water Science* 3 (3), 567-576
36. Equeenuddin Sk. Md., Tripathy, S., Sahoo, P. K., Panigrahi, M. K. (2013) Metal behavior in sediment associated with acid mine drainage stream: Role of pH. *J. Geoch. Explor*. 124, 230-237
37. Panigrahi MK, Pandit D., Naik, RK and Ishihara S (2013) Reconstruction of physicochemical environment of hydrothermal mineralization at Malanjkhand copper deposit, central India: Constraints from sulfur isotope ratios in pyrite, molybdenite and chalcopyrite. *Resource Geology*, 63, 110-116
38. Panigrahi MK (2012) Chemistry of the cupriferous ore fluid (COF) at malanjkhand copper deposit, central India: Constraints from ion chromatography of fluid inclusion leachates. *Journal of Applied Geochemistry* 14 (4), 383-392
39. Pandit D and Panigrahi MK (2012) Comparative petrogenesis and tectonics of Paleoproterozoic Malanjkhand and Dongargarh granitoids, Central India. *J. Asian Earth Sci*., 50, 14-26

40. Bhattacharya S., Majumder TJ, Rajawat AS, Panigrahi MK and Das PR (2012) Utilization of Hyperion data over Dongargarh, India, for mapping altered/weathered and clay minerals along with field spectral measurements. *Int J Rem Sens*., 33, 5438-5450
41. Sahoo PK, Tripathy S, Equeenuddin Sk Md, and Panigrahi MK (2012) Geochemical characteristics of coal mine discharge vis-a-vis behavior of rare earth elements at Jaintia Hills coalfield, northeastern India *J. Geoch Explor*., 112, 235-243
42. Dey, RS , Hajra, S, Sahu, RK, ,Raj, CR and Panigrahi, MK (2012) A rapid room temperature chemical route for the synthesis of graphene: metal-mediated reduction of graphene oxide. *Chem. Comm*., 48, 1787-1789
43. Sahoo, P. K., Tripathy, S., Panigrahi, M. K. Equeenuddin Sk. Md. (2012) Mineralogy of Fe-precipitates and their role in metal retention from acid mine drainage. *Mine Water & Environment*, 31, 344-352
44. Bhattacharya S.; Panigrahi M. K (2011) Heterogeneity in fluid characteristics in the Ramagiri-Penakacherla sector of the Eastern Dharwar Craton: implications to gold metallogeny. *Russ. Geol. Geophy*., 52, 1436-1447
45. Equeenuddin Sk. Md.; Tripathy S.; Sahoo P. K and Panigrahi MK (2010) Geochemistry of ochreous precipitates from coal mine drainage in India. *Env. Earth Sci*., 61, 723-731
46. Sahoo, PK, Bhattacharyya, P, Tripathy, S, Equeenuddin, SM and Panigrahi, MK (2010) Influence of different forms of acidities on soil microbiological properties and enzyme activities at an acid mine drainage contaminated site. *J. Hazard. Mat.*, 197, 966-975
47. Equeenuddin, SM , Tripathy, S , Sahoo, PK and Panigrahi, MK (2010) Hydrogeochemical characteristics of acid mine drainage and water pollution at Makum Coalfield, India . *J. Geoch. Explor*., 105, 75-82
48. Panigrahi MK, Naik RK, Pandit D and Misra KC (2008) Reconstruction of the environment of hydrothermal mineralization of copper from mineral chemistry of biotite, chlorite and epidote: A case study from the Mlanjkhand deposit, Central India. *Geoch. J*. 42, 367-392
49. Moriyama T, Panigrahi MK, Pandit D and Watanabe Y (2008) Rare earth element enrichment in late-Archean manganese deposits from the Iron Ore Group, Eastern India. *Res. Geol*, 58, 402-413
50. Panigrahi MK and Gupta S (2007) Graphite-bearing fluid inclusions and their significance to late stage exhumation processes: case studies from two disparate terrains in India. *Acta. Petrol. Sinica*, 23 (1): 53-64
51. Gupta S, Sarkar M and Panigrahi MK (2007) Disentangling tectonic cycles along a multiply deformed terrane margin: Structural and metamorphic evidence for mid-crustal reworking of the Angul granulite complex, Eastern Ghats Belt, India. *J. Struct Geol*., 29, 802-818
52. Pal DC, Panigrahi MK and Mishra B (2006) Contrasts in the fluid characteristics and evolution in the Sn-bearing and barren pegmatites of the Bastar-Malkangiri Tin Belt : Implications to the genesis of Sn mineralization *J. Asian Earth Sci*., 28, 306-319
53. Panigrahi MK, Bream B, Misra KC and Naik RK (2006) Reply to discussion on ‘‘Age of granitic activity associated 5 with copper–molybdenum mineralization at Malanjkhand,

central India'' by Holly Stein, Judith Hannah, Aaron Zimmerman, and Richard Markey. *Mineralium Deposita*, 40 (6), 766-768

54. S. Ravi Kumar, Panigrahi M.K., S.K. Thakur , K.U. Kainer , M. Chakraborty , B.K. Dhindaw (2006) Characterization of stress in reinforcements in magnesium based squeeze infiltrated cast hybrid composites. *Materials Science & Engg. A*, v 415, 207-212
55. Tripathy S, Panigrahi MK and Kundu N (2005) Soil geochemistry of a fluoride contaminated area in the Nayagarh district, Orissa, India: A factor analytical appraisal. *J. Environmental Geochem. & Health*, 27, 205-216
56. A Chattopadhyay, N.Bandyopadhyay, A.K.Das, M.K Panigrahi (2005) Oxide Scale Characterization of Hot Rolled Coils by Raman Spectroscopy Technique. *Scripta Materiala*, 52, 211-215
57. S. Gupta, M. K. Panigrahi and Meenakshi Sarkar(2005) The late-stage evolution of the Angul migmatitic terrain, Eastern Ghats Belt, Orissa: constraints from integrated structural and fluid inclusion studies. (Indian J. Geology: Prof. A. De Memorial Volume, V.75 (2003), 147-166
58. Mandal Madhuri, Jana Nikhil Ranjan, Kundu Subrata, Ghosh Sujit Kumar, Panigrahi Mruganka and Tarasankar Pal (2004) Synthesis of Aucore–Agshell type bimetallic nanoparticles for single molecule detection in solution by SERS method *Journal of Nanoparticle Research* , 6(1), 53-61
59. Panigrahi MK, Bream B., Misra KC, and Naik RK (2004) Age of granitic activity associated with copper-molybdenum mineralization at Malanjkhand, Central India *Mineralium Deposita* 39, 670-677
60. Varadwaj KSK, Panigrahi MK and Ghose J (2004) Effect of Capping and particle size on Raman laser induced degradation of γ-Fe2O3 Nanoparticles. *J. Solid State Chem*. 177, 4286-4292
61. Mandal Madhuri, Kundu Subrata, Ghosh Sujit Kumar, Jana Nikhil Ranjan, Panigrahi Mruganka K. and Pal Tarasankar (2004) Sniffing a single molecule through SERS using Aucore-Agshell bimetallic nanoparticles. *Curr. Sci.*, 86, No.4, 556-559
62. Kundu N,, Panigrahi M.K Sharma SP. and Tripathy S.(2002) Delineation of fluoride contaminated groundwater zones around a hot spring using resistivity sounding in Nayagarh district of Orissa, India . *Environmental Geology*, 43, 228-235
63. Kundu N., Panigrahi MK, Trpathy S Munshi S. Hart BR and Powell MA,.(2001) A geochemical Appraisal of Fluoride contamination of ground water in Nayagarh District, Orissa, India: *Environmental Geology* , 41, 451-460
64. Panigrahi MK (2001) Iron and base metal mining in India: An analysis of current trend in production, price and consumption. In: Subbarao KV and Reddy RD (Ed.) *Some aspects of mineral development in India*. Geol. Soc. Of India Sp. Publ. 95-112
65. Mishra B and Panigrahi MK (1999) Fluid evolution in the Kolar Gold Field: Evidence from fluid inclusion studies. *Mineralium. Deposita*, 34, 173-181
66. Mishra B., Pal D.C. and Panigrahi MK(1999) Fluid evolution in quartz vein-hosted tungsten mineralization in Chhendapathar, Bankura District, West Bengal: Evidence from fluid inclusion study. *Proc. Ind. Acad. Sci.* (Earth & Planet. Sci.), 108, 23-31

67. Pal DC, Panigrahi MK and Mishra B (1998) Fluid inclusion characteristics of tin bearing pegmatites of Malkangiri district, Orissa. *Jour. Geol. Soc. Ind*.,51, 685- 696.
68. Panigrahi MK and Mookherjee A(1998) 'The Malanjkhand copper(+molybdenum) deposit, India: .....' - A reply, *Mineralium. Deposita*, 33, 430-432
69. Panigrahi MK and Mookherjee A(1997) The Malanjkhand copper(+ molybdenum) deposit, India: Mineralization from a low-temperature ore-fluid of granitoid affiliation. *Mineralium Deposita*, 32, 133-148
70. Mookherjee A and Panigrahi MK(1994) Reserve base in relation to crustal abundance of metals: Another look. *J. Geochemical. Exploration.,* 51, 1-9
71. Panigrahi MK, Mookherjee A Pantulu GVC and Gopalan K(1993) Granitoids around the Malanjkhand copper deposit: Types and age relationship. *Proc. Ind.Acad. Sci(Earth Planet. Sci.*, 102, 399-413
72. Panigrahi MK Mishra B and Mookherjee A(1991) Ore mineralogy and fluid inclusion characteristics of different ore-associations from Malanjkhand copper deposit, MP,India. *J. Geol. Soc. Ind*., 37,38-56
73. Mishra B and Panigrahi MK(1990) Fe-Zn mixing energetics of the Iss phase in the system Cu-Fe-Zn-S. *Contrib. Mineral. Petrol*., 105,562-568

PUBLICATIONS IN BOOKS/MONOGRAPHS

1. S. Tripathy, M. K. Panigrahi and N. Kundu : Appraisal of Fluoride Contamination of Groundwater through Multivariate Analysis : A case study , In:Prasad MNV, Sajwan KS and Naidu R (Ed) Trace Elements in the Environment: Biogeochemistry, Biotechnology, and Bioremediation (CRC Press) 2005, Chap 7,
2. Panigrahi MK, Pandit D and Naik RK (2009) Genesis of the early-Proterozoic granitoid affiliated copper-molybdenum mineralization at Malanjkhand: A review of status. In: Santosh Kumar (Ed) *Magmatism, Tectonism and Mineralization*, New Delhi, Macmilan, pp 265-292

CONFERENCE PRESENTATIONS

International:

1. **Panigrahi MK** Mishra B and Mookherjee A(1988) Ore petrological study of the Proterozoic Cu-Mo mineralization at Malanjkhand, MP, India with special reference to fluid Inclusion characteristics. Int. Symp. on Metallogeny Related to the Proterozoic Mobile Belts(IGCP), Dec. 8-10, Calcutta
2. Mookherjee Asoke and **Panigrahi M.K** (1994) Reserve base vis-a-vis crustal abundance of metals: A relook. International Conference on Genesis of Ore Deposits (9th IAGOD), Aug. 4 - 8, Beijing.

3. Mishra B and **Panigrahi MK** (1996) Contrasting fluid evolution pattern in the Kolar Gold Field: Evidence from fluid inclusion studies. (Extended Abstract) PACROFI VI, Wisconcin, Madison, May, 1996
4. **Panigrahi MK**, Misra KC, Bream B and Naik RK (2002) Genesis of the Granitoid affiliated copper-molybdenum mineralization at Malanjkhand, Central India : Facts and problems. (Extended Abstract, 11th IAGOD and Geocongress 2002, Windhoek,Namibia, 22 – 26 July)
5. **Panigrahi MK** (2003) Granites and copper mineralization at Malanjkhand, MP, India : search for a rationale for the genetic linkage. V Hutton Symposium, Toyohashi, 2-6 Sep, 2003
6. **Panigrahi MK** and Gupta S. (2006) Graphite-bearing fluid inclusions and their implications to late-stage exhumation processes: case study from two disparate terrains in India. (Accepted for oral presentation at ACROFI-I, Nanjing University, China, 26-28 May, 2006)
7. **Panigrahi MK** (2006) A visual C^{++} - MFC based application software for fluid inclusion data analysis and presentation. (Accepted for poster presentation at ACROFI-I, Nanjing University, China, 26-28 May, 2006)
8. Pandit Dinesh and **Panigrahi MK (2008)** Microtextural study of the Malanjkhand quartz reef: Implications to post-depositional deformation In: International Conference on Tectonics of the Indian Subcontinent (TOIS), IIT Bombay, March 3-6, 2008. International Association for Gondwana Research Conference Series 5, p. 138.
9. Gupta, S. **and Panigrahi, M. K. (2008). The southern Rengali Province – a reworked or exotic terrane?** International Conference on Geology – Indian scenario and global context, Indian Statistical Institute, Kolkata, January 7-11, Program and Abstracts**, p. 42.**
10. Dutta, A., Gupta, S. and **Panigrahi, M. K.** (2008). Stratigraphy, structure and metamorphism of the Rengali Province – implications for the tectonics of the Eastern Indian Shield. International Conference on Tectonics of the Indian Subcontinent (TOIS), IIT Bombay, March 3-6, 2008. International Association for Gondwana Research Conference Series 5, p. 159.
11. Pandit D., Panigrahi MK, Naik R.K. (2008) Fluid characteristics in the leucogranite phase of the Malanjkhand Granitoid Complex: implications to copper-molybdenum mineralization. Proceedings of ACROFI-2 (Second meeting of the Asian Current Research on Fluid Inclusions), I I T, Kharagpur, Nov 12-14, 2008, pp 144 – 146
12. Panigrahi MK, Pandit D, Moriyama T and Ishihara S (2009) Paleoproterozoic granite-ore system in the perspective of crustal evolution: Insights from the Malanjkhand copper deposit and surrounding granitoids in the Central India Craton. Proc of the Tenth Biennial meeting of SGA, pp 957-959

13. Panigrahi MK and Bhattacharya S (2010) Heterogeneity in fluid characteristics in the granite-greenstone ensemble of the Eastern Dharwar craton: A synoptic overview. Proc. ACROFI-3 and TBG XIV, 15-20 Sep, 2010, Novosibirsk, Russia, pp 162-63
14. Panigrahi MK and Acharya SS (2010) A Microsoft Excel 2007 and MS Visual Basic Macro based software package for computation of density and isochors of fluid inclusions. Proc. ACROFI-3 and TBG XIV, 15-20 Sep, 2010, Novosibirsk, Russia, pp 160-61
15. Bhattacharya S., Panigrahi MK and Jayananda M (2011) Fluid inclusion characteristics in parts of Closepet granite, south India. In: Proceedings, International Symposium on Precambrian Accretionary Orogens. New Delhi, pp 8-10
16. Bhattacharya S., Panigrahi MK (2012) Fluid regime in the Ramagiri-Penakacherla granite greenstone ensemble of Eastern Dharwar Craton: Implications for gold metallogeny. In: 4th Biennial conference on Asian Current Research on Fluid Inclusions (ACROFI-IV), Brisbane, Australia, pp 7-8
17. Bhattacharya S., Panigrahi MK (2014) Fluid stratification in the Dharwar crust: insights from Closepet granite. In; Proceedings of the Vth Asian Current Research on Fluid Inclusions (ACROFI-V), Xian, China
18. Rout D., Panigrahi MK and Pati JK (2016) Origin and evolution of giant quartz reef s in the Bundelkhand craton, India: Constraints from Fluid Inclusion study. Proc. VI ACROFI (Asian Current Research on Fluid Inclusions), 2016, (Abstract Volume, pp 72-75).
19. Rout D., Panigrahi MK and Pati JK (2017) Fluid characteristics in the giant quartz reef system of the Bundelkhand craton, India: Constraints from fluid inclusion study. (Abstracts) AGU Fall Meeting, New Orleans

National

1. Rao KS **Panigrahi MK** Das RP Mishra B Ray HS Mukunda PG and Mookherjee A(1989) Use of mineralogical studies during ammonia leaching of multimetal sulfides. ATM abstracts, 27th AMD and 43rd ATM, 14-17 Nov, Calcutta
2. Rao KS Das RP **Panigrahi MK** Mishra B Ray HS Mukunda PG and Mookherjee A(1989) Mineralogical studies on roasting reactions of multimetal sulfides. Ibid.
3. **Panigrahi MK** (2001) Iron and base metal mining in India: An analysis of current trend in production, price and consumption. *National Sem. On Mineral Based Industries : Present Status and Future Prospects, Visakhapatnam, 5-7 Dec., 2001*

4. Pati Jayanta K. and **Panigrahi Mruganka K**. (2005) Molybdenite-bearing granitoids from Bundelkhand Craton and the nature of mineralizing fluid. In: Proterozoic System of India: Evolution and Economic Potentials. (Abstract Volume) ISM Dhanbad, Nov. 11-12, 2005
5. Pandit D and Panigrahi MK (2007) Emplacement mechanism of the Malanjkhand granite: constraints from bulk and mineral chemistry: In Himalayan Geology, v28, Abstract Volume on Collision Zones and Geodynamic Workshop, Sep 20-21, 2007
6. Panigrahi MK (2007) Genesis of the granitoid affiliated Paleoproterozoic copper-molybdenum mineralization at Malanjkhand: A review of status. (presented at the National Seminar on Magmatism, Tectonism and Mineralization at Kumaon University, Nainital , 29-31 Oct. 2007)
7. Bhattacharya S., Panigrahi MK(2014) Physicochemical characterization of Archean granitic hydrothermal systems vis-à-vis lode goldmineralization: insights from Eastern Dharwar craton, south India. In: International Seminar on Magmatism, Tectonism and Mineralization (MTM-2014), Nainital, India, pp 98-99.

MISCELLANEOUS

1. **Panigrahi MK**(1994) Fluid inclusions in minerals : In Mookherjee A (Ed.) A profile of Geoscience Research in India - A status Report. Diamond Jubilee Publication of INSA, New Delhi, INSA, pp 42-45
2. **Panigrahi M.K**.(2000) Thermodynamics of aqueous electrolytes: Implications to hydrothermal ore forming environments: (Lecture Note) In: DST Sponsored Contact Programme on *Chemical Thermodynamics & its application to Petrological Problems* Jadavpur University, 30 Oct. – 17 Nov, 2000. (unpublished)
3. **Panigrahi MK**, Gupta Saibal and Sarkar M. (2003) Fluid inclusion microthermometry and Raman Microspectrometric studies on migmatites of the Eastern Ghats Mobile Belt around Angul, Orissa : New insights into the late stage evolution process. Newsletter, Deep Continental Studies in India (DST), 13(2), 14-19
4. Mishra B and **Panigrahi MK** (2004) Project completion report : “Genesis of Greenstone-hosted gold deposits in and around Hutti and Mallappakonda with exploration implications”. (unpublished) Submitted to DCS, DST, Government of India 176p
5. **Panigrahi MK (2006)** Thermodynamic analysis of solubility of metals in hydrothermal fluids. In: Mineral Deposit Modeling Lecture Notes, DST Advanced Training Programme on Mineral Deposit Modeling, Department of Geology, Jammu University, pp 25-44

6. **Panigrahi MK (2006)** Mineral potential mapping: methodologies and practice. In : Mineral Deposit Modeling Lecture Notes, DST Advanced Training Programme on Mineral Deposit Modeling, Department of Geology, Jammu University, pp 66-74
7. Panigrahi MK and Pruseth KL (2020) Ore deposit modeling: the current Indian scenario. *Proc. Ind. Nat. Acad. Sci (in press)*