Curriculum Vitae

Name	: Dr. Sethuraman Ramesh
Date of Birth	: 20.05.1968
Qualification	: BSc (Geology - 1988), M.Sc (App Geology - 1990),
	: Ph.D in Marine Geology from University of Madras – 1998 Title:"Sedimentation and Paleo-climatic conditions of Late Pleistocene – Holocene sediments of the eastern part of Lower Bengal Fan, Northeast Indian Ocean"
Specialization	: Geological Oceanography, Deep Sea Vehicles design and development, Deep sea mineral Exploration

Research Experience : 29 years in geological oceanography

- Serving as Scientist in National Institute of Ocean Technology-MoES, Chennai since 2002
- Project Leader at ICMAM-DOD funded research project in Anna University –1998-2002
- Junior and Senior Research Fellow under DOD & CSIR, Govt of India from 1992-97

Present Designation : Scientist – G, Scientist in Charge; Deep Sea Technology Group,
Project Director – Component 1 of Deep Ocean Mission
National Institute of Ocean Technology, Chennai - MoES
[redacted]

As Scientist in Charge presently involved in

- Design and Development of Manned Submersible for 6000 m operational capability for deep ocean research
- Realization of 6000 m depth rated Autonomous Underwater Vehicle for deep sea mineral exploration
- Coordination of activity for Integrated Mining System development for polymetallic manganese nodule exploratory mining
- Lead member in development of policy proposal documentation with Detail Project Report for the Deep Ocean Mission program of Government of India for the development of deep sea vehicles for deep ocean research
- Annual report preparation and submission to International Seabed Authority
- Technology for gas hydrate research

Details of Professional employment:

- Scientist G and Scientist In Charge for Deep Sea Technology Group of NIOT, MoES – Since Dec 2020
- Scientist G in Deep Sea Technology group of NIOT, MoES – July 2020 to Dec 2020
- Scientist F in Deep Sea Technology Group of NIOT, MoES – July 2015 to June 2020
- Scientist E in Submersibles and Gas Hydrate group of NIOT, MoES – July 2010 to June 2015
- Scientist D in Submersibles and Gas Hydrate group of NIOT, MoES – July 2006 to June 2010
- Scientist C in Submersibles and Gas Hydrate group of NIOT, MoES – June 2005 to June 2006
- Scientist B in Coastal and Environmental Engineering Group of NIOT – Nov 2002 to May 2005

Awards/ scholarships

A. National Awards

1. National Geo-science Award 2010 from Ministry of Mines, Government of India on 16th February 2012 for the outstanding contribution in the field of Oil and & Natural Gas Discovery and Exploration.
2. National Research Development Corporation (Govt of India), National Meritorious Invention Awards – 2018 under the category of National Societal Innovation Award - 2018, for the invention of "Underwater Remotely Operated Vehicle for Polar and Shallow Water Research"

B. Scholarships

1. Junior Research Fellow under Department of Ocean Development Project during September 1992 to 94 and promoted as Senior Research Fellow under during 1994.
2. Senior Research Fellow under independent CSIR scheme during 1995 and completed the Ph.D work titled "Sedimentation and Paleoclimatic conditions of Late Pleistocene – Holocene sediments of the eastern part of lower Bengal Fan, Northeast Indian Ocean"
3. Visited Germany under DST-DAAD bilateral project scheme between Anna University, Chennai and University of Suderberg, Suderberg, Ulzen, Germany during 2001

C. Working Group member in India for International Geological Correlation Program (IGCP)-495 "Quaternary Land – Ocean interactions: Driving mechanisms and coastal responses" - 2004-06

Professional / Research Experience

1. Lead Team member and geo-scientific payload interface in charge in following underwater technology development for deep sea mineral exploration and scientific studies
    a. Scientist in charge for the development of technology for deep sea mining and underwater vehicles for deep sea exploration since December 2020
    b. Lead member for Design and development of Manned Submersible (Human Occupied Vehicle) for 6000 m operational depth capability – *Design and development is in progress*
    c. Lead member in Realization 6000 m depth rated Autonomous Underwater Vehicle for 6000 m operational capability for high resolution mapping for the requirement Environmental Impact Study during mining technology demonstration for polymetallic manganese nodule from Central Indian Ocean Basin – Exploration scheduled in last quarter of 2022
    d. Design, development and qualification of Unmanned Remotely Operated Underwater Submersible ROSUB 6000 for 6000 m operational depth capability with all scientific payloads – since 2004 and qualified the vehicle at 5289 m at Central Indian Ocean Basin during March 2010
    e. Design, development and qualification of deep sea unmanned Wire-line Autonomous Coring System for long core sampling for 3000 m depth operational capability to collect long core sampling –qualified its operational depth capability at 2910 m in Bay of Bengal and collected long cores of upto 102 m below the sea floor during Feb 2020
    f. Design, development and qualification of Shallow water cum Polar Remotely Operated Vehicle for 500 m operational capability – since 2013 and qualified the vehicle at Antarctica during March 2015
    g. Established of insitu experimental laboratory for gas hydrate research

2. **Involved in following major research activity in last ten years:**
   a. Participation in **34th Indian Scientific Expedition to Antarctica during January to April 2015**
   b. Exploration with Polar Remotely Operated Vehicle at Priyadarshini Lake near Maitri station and **New Indian barrier ice shelfs (62 m)**
   c. Design and development Polar/Shallow Water ROV and conducting the **first sea trial in Idukki lake (105 m)**
   d. **Identification and recovery of buried torpedo** from the depth of 168 m in Bay of Bengal
   e. Exploration using **ROSUB 6000** for hydrothermal sulphides at **Sonne Field near Rodriguez Triple Junction in Southern Indian Ocean at a depth of 2812 m** and live web casting of the sea floor images
   f. **Sampling the buried nodule with ROSUB 6000-ROV mounted short corer at a depth of 5289 m** from Central Indian Ocean Basin Poly-metallic Manganese Nodule Site
   g. **Dissolved Oxygen anomaly** from the deep water profiles upto 2000 m from ROSUB 6000 had been used as a tracer to establish the mixing mechanism of **intermediate water at a depth of 400 to 700m water depth**
   h. Establishing **chemosynthetic habitats assemblage** at Krishna Godhavari Basin **gas hydrate site at 1100 m** water depth using ROSUB 6000
   i. Team lead for the development and qualification of **Autonomous Coring system** in Indian waters at a depth of 3000 m in Bay of Bengal and drilled upto 100 m below sea floor for gas hydrate research
   j. Deep water qualification testing upto a depth of 1500 m and soft foot system realization for landing at gas hydrate site of Krishna-Godhavari Basin
   k. **Reservoir and mathematical modeling studies** for **methane hydrate extraction** by in-situ electric heating and de-pressurization with reference to the fine clay marine settings of India
   l. Establishing the **laboratory set-up for Ocean CO_2 sequestration studies** under Climate Change Studies program

3. **Details of field experience for deep ocean research and underwater vehicle development since 2005**
   A. Participated in **Antarctic Summer Expedition during 2015** with Polar ROV (PROVe 500) in Russian Ship Ivan Papanin
   B. Organized and participated in summer expedition for gas hydrate exploration and sampling cruise in **Lake Baikal, Siberia, Russia in the RV Verschigen under ILTP** in 2005 and winter expedition in 2006
   C. Participated in **JOIDES, US drilling ship cruise in India for deep sea LWD operation** for geophysical logging to decipher gas hydrate occurrence in Bay of Bengal during May 2006
   D. Participated in **MarioneDufresne (French research Ship)** long core sampling cruise in Bay Bengal during May 2007
   E. ROV qualification trials in **ORV SagarKanya** during September 2006 and June 2007
   F. Search and survey operation with sidescan sonar and ROSUB 6000 along with mini-ROVER ROV in NagarjunaSagar lake during 2006 and in Bay Bengal during 2015
   G. Deep water ROV (ROSUB 6000) sea trials in **TDV SagarNidhi** in different phases since 2008
   H. Qualification trial of Autonomous Coring System at **Puget Susan, Seattle, USA** and drilling operation performed upto 57 m at 100 m water depth during August 2009
   I. Different series of exploration and qualification sea trial of Autonomous Coring system in Indian waters in ORV SagarNidhisince 2010 in Bay of Bengal

4. Involved in geo-scientific survey and map generation for the shallow water sea bed in different project of National Institute of Ocean Technology, MES, Chennai from November 2002 to 2004

   Major work elements are sidescan and multibeam data acquisition, processing, generation of map and report writing. Interpretation of the sediments analyzed for texture, sediment transport vectors and geochemistry

   a) Marine Geological and geophysical survey (Sidescan, Subbottom and magnetic) at Gulf of Cambay (November 2002 – January 2003)
   b) Sampling for Archaeological materials in Gulf of Cambay (2002-2003)
   c) Hydrographic and geophysical survey at Haldia, Jellingham channel and Ballari Passage (2003 - 2004)
   d) Gabion positioning and sidescan survey at Dhahej for laying offshore pipeline (April 2003)
   e) Multibeam and single beam bathymetry survey for post dredging analysis at different ports and islands
   f) Marine geological and geophysical investigation for fixing the Dam alignment for Kalpasar project (Gulf of Cambay) during 2004
      1. Data acquisition and processing of the multibeam and sidescan data and generated the bathymetry and sea bed morphology map for selecting suitable corridor for the Kalpasar dam alignment
      2. Compilation of all the data sets and generated structural control maps with details of faults, channels and fractures
   g) Hydrograhic and sparker based single channel seismic survey for Sehusamudram canal dredging project (November 2004)
   h) Shoreline erosion studies at Uppada coast, Andhrapradesh under common minimum program (2004)

5. No Impact Zone studies in Critical Habitats of Pulicat Lake Ecosystem – project sponsored by ICMAM-DOD at Institute for Ocean Management, Anna University (April 1999 – October 2002)
   a. Integrated studies on geology, biology, water chemistry, remote sensing outputs from PulicatLake
   b. Activity - impact analysis in different zones of PulicatLake
   c. Impact studies of EnnorePort on shore line changes and PulicatLake inlet
6. Rate of Sedimentation and Elemental Accumulation in coastal ecosystems of Tamilnadu – project sponsored by BARC at Institute for Ocean Management, Anna University (April 1998 – March 1999)
   a. Collection of cores from different ecosystems of Tamilnadu
   b. Analysis for Pb210 and Ra 226 for calculating rate of sedimentation in recent 100 years
7. Comparative studies on River Elbe and River Adyar under DST-DAAD program during December 2001
   b. Pollution load studies in River Adyar
   c. Ground water modeling for contamination studies
8. Quaternary sediments of incised valleys of Bay of Bengal "BENFAN" project under Department of Ocean Development, Government of India at Department of Geology, University of Madras, Chennai (October 1992 – March 1998)
   a. Collection and sub-sampling of core samples from 3500 – 3700 m water depth in Bay of Bengal
   b. Clay mineralogical studies of sub-samples by X-ray diffraction techniques
   c. Geochemical analysis and interpretation (major, trace and REE)
   d. Sample preparation for Palynological (spores and pollens) observations of deep sea sediment cores
   e. Interpretations for establishing paleoclimatic fluctuations

9. Instruments and Software packages handled

I - Instruments Used

a) Coastal dynamics
   1) RTK GPS for shoreline mapping
   2) Beach profile survey dumpy level and wave sled
   3) Sediment transport and vector studies using standard software packages like LITPACK, GAO model etc

b) Hydrographic and geophysical survey equipments
   1) RESON MultibeamEchosounder (7125, 7128, 8125, 8101 and 8160)
   2) Edgetech Side scan sonar (Digital fish DF 1000)
   3) Edgetech Sub bottom profiler (Chirp sonar SB 216 and 512)

c) Geological and Geochemical Equipments
   1) Hitachi model Atomic Absorption Spectrophotometer at IOM, Anna University
   2) ICP-MS at National Geophysical Research Institute, Hyderabad
   3) JEOL X-ray diffractometer for clay mineralogical studies at CECRI, Karaikudi
   4) Malvern Particle size analyzer at IOM, Anna University
   5) Gravity and Box corers, grab samplers and dredgers for sediment sampling

d) Deep sea Exploration vehicle design, development and usage
   1) Deep sea work class Remotely Operated Vehicle (ROSUB 6000)
   2) Shallow water cum Polar Remotely Operated Vehicle (PROVe 500)
   3) Deep sea Autonomous Coring System (ACS 3000)

II - Data processing software packages Handled
   a. Triton Elics Inc software for side scan data logging, processing and mosaicing with Delph Map package
   b. Hypack - data logging and processing software for bathymetry survey
   c. RESON 6042 software for multibeam data logging and processing
   d. PDS 2000 for multi-beam data processing
   e. Terra model and Terra vista for multibeam data editing & processing
   f. CABRET for biogeochemical budgeting studies
   g. SURFER & DIDGER for data processing
   h. SPSS for statistical analyses

Research Publication

A. Journal Publications

Journals

1. C.Sandhya, **S.Ramesh** et.al (2022) Human Metabolic Simulator for manned submersible, Current Science (Accepted).
2. N.Vedachalam, **S. Ramesh,** et.al, (2020) "Techno-economic viability studies on methane gas production from gas hydrates reservoir in the Krishna-Godavari basin, east coast of India", Journal of natural gas science and engineering, Vol.77, May 2020
3. G.A. Ramadass, **S. Ramesh,** et.al , (2020) "Unmanned Underwater vehicles: Design considerations and outcome of scientific expeditions", Current Science, Vol.118, Issue 11, pp:1681-1686, 10th June 2020
4. **S. Ramesh**, et.al, **2019**, "Occurrence of Nummulitic coralline limestone from offshore Palar Basin", Bay of Bengal, India, 2019, **Marine Geo-resources &Getechnology, 2019** (Accepted). DOI: 10.1080/1064119X.2018.1551447.
5. V. Doss Prakash, N. Vedachalam, R Ramesh, **S.Ramesh** and G.A.Ramadass,**2019,**Assessment of the effectiveness of the subsea optical wireless communication system in the Arabian Sea using field data, Marine Technology Society Journal, **Jan 2019**.
6. G.A. Ramadass, **S.Ramesh et.al (2018)** Development of Manned Submersible -MATSYA 6000. Proceedings of Proceedings of the 15th MTS MUV Symposium Underwater Intervention , **2018,** New Orleans, USA
7. N.Vedachalam,**S.Rameshet.al (2018)** Numerical modeling of methane gas productionfrom hydrate reservoir of Krishna Godhavari basin by depressurization, **Marine Georesources&Geotechnology, January 2018** (Taylor &Fracis).
8. **S. Ramesh,**et.al Application of indigenously developed remotely operated vehicle for the study of driving parameters of coral reef habitat of South Andaman Islands, India", **Current Science Journal,** Volume 113, Issue 12, PP:2353-2359, **December 2017 (Shallow water ROV picture was published in cover page of the issue)**
9. N. Vedachalam, **S. Ramesh,**et.al Modeling of rising methane bubbles during production leaks from the gas hydrate sites of India", **Marine Georesources&Geotechnology Journal,** PP:1-8, **December 2017**
10. N Vedachalam, A Vadivelan, AUmapathy, M Murugesan, G Durai, E Chandrasekaran, CJothi, R Ramesh, **S Ramesh** and G A Ramadass. Concept and Testing of a Remotely Operated Vehicle-Mountable Inductive Electrothermal Polar Under-Ice Corer", **Marine Technology Society Journal,** Volume 51, Issue 6, PP:33-43, November/December **2017 (Polar ROV expedition in Antarctica was published in cover page of the issue in MTS journal)**
11. Vinithkumar, N.V, Kirubagaran, R, **Ramesh.S et al.2017,** Coral Bleaching Along Andaman Coast Due to Thermal Stress During Summer Months of 2016: A Geospatial Assessment, **American Journal of Environmental Protection,**Vol 6, pp.1-6
12. **S. Ramesh et al** 2016 "Qualification of Polar Remotely Operated Vehicle at East Antarctica", **IEEE Oceans, USA,2016**
13. N. Vedachalam, **S. Ramesh,** S. Srinivasalu G. Rajendran G.A. Ramadass, M.A. Atmanand**, 2016.** Assessment of methane gas production from Indian gas hydrate petroleum systems, Elsevier's**Applied Energy,** Vol. 168 / 649-660, (2016).

14. Vishnu C.N., **S. Ramesh,** G.A. Ramadass, J.S. Sangwai, Influence of thermal stimulation on the methane hydrate dissociation in porous media under confined reservoir, **J of Petrol Sci and Eng,(2016).**
15. N.Vedachalam, **S.Ramesh,**VBN.Jyothi, N.Thulasi Prasad, R.Ramesh, D.Sathianarayanan, G A Ramadass, M AAtmanand**(2015).** Evaluation of depressurization based technique for methane hydrates reservoir dissociation in a marine setting, Krishna Godavari Basin, east coast India, **Journal of Natural Gas Science and Engineering, Elsevier,** v.25, pp226-235 (2015)
16. **S.Ramesh,**N.Vedachalam, R Ramesh, N.Thulasi Prasad, G A Ramadass, M A Atmanand (2014). An approach for methane hydrates reservoir dissociation in a marine setting, Krishna Godhavari Basin, east coast India, **Journal of Marine and Petroleum Geology, Elsevier**, v58, pp540-550, **2014.**
17. **S. Ramesh,** G.A. Ramadass, M. Ravichandran, M.A. Atmanand, Dissolved oxygen as a tracer for intermediate water mixing characteristics in the India Ocean. **Current Science**, Vol 105, NO.12, 25 **December 2013**, page 1724-1729.
18. Raju Ramesh, DharmarajSathianarayanan, Vittal Doss Prakash, ArumugamVadivelan, **Sethuraman Ramesh,**GiduguAnandaRamadass and MalayathAravindakshanAtmanand Failure Analysis of Fiber Optic Communication System in Deep-Water Remotely Operated Vehicle ROSUB 6000, **Marine Technology Society Journal,** Vol. 48, Issue 3, **May/June 2014**, page 63-72.
19. BhaskaranPranesh, DharmarajSathianarayanan, **Sethuraman Ramesh** and GiduguAnandaRamadass Structural Reinforcement of Viewports in Spherical Pressure Hull for Manned Submersibles, **Marine Technology Society J,** Vol. 48, Issue 3, **May/June 2014**, page 17-24.
20. Ramesh Raju, VedachalamNarayananaswamy, MuthukumaranDurairaj, Doss PrakashVittal, **Ramesh Sethuraman,**RamadassGiduguAnanda and AtmanandMalayathAravindakshan. Design and implementation of compact and robust medium voltage switchgear for deep water work-class ROV ROSUB 6000". **Society of Underwater Technology Journal**, V 31, p 1-11, **2013.**
21. BhaskaranPranesh, DharmarajSathianarayanan, **Sethuraman Ramesh,**GiduguAnandaRamadass, 2013, Manufacturing imperfection sensitivity analysis of spherical pressure hull for manned submersible, **Marine Technology Society Journal,** Vol. 47, **2013,** page 64-72.
22. RajeshwaraRao, N, Kamatchi, P and **Ramesh.** S,2012, Deep-sea foraminifera in a short core from the Bay of Bengal: ecological comparisons with the South China and Sulu Seas. **Arabian Journal of Geo-science (Springer). June 2012**
23. G. A. Ramadass, **S. Ramesh,** J. ManeciusSelvakumar, R. Ramesh, AN. Subramanian, D. Sathianarayanan, G. Harikrishnan, D. Muthukumaran, V. K. Jayakumar, E. Chandrasekaran, M. Murugesh, S. Elangovan, V. Doss Prakash, M. Radhakrishnan and A. Vadivelan.(2010) Deep Ocean exploration using Remotely Operated Vehicle at Gas hydrates site in Krishna Godhavari Basin, Bay of Bengal. **Current Science,** under Research Communication category, VOL 99, NO.6, 25 **Sep 2010,** page 809-815.
24. P.KasinathaPandian. ***S.Ramesh***, et.al (2004) Shoreline changes and Near shore processes along Ennore coast, East coast of India. **Journal of Coastal Research (Allen Press, Florida)**, v.20 (3), pp.828-845
25. S.Kathiroli, S.Badrianarayanan, B.Sasisekaran and ***S.Ramesh*** (2004) Recent Marine Archaeological findings in Khambat, Gujarat. **Journal of Indian Ocean Archaeology**, No.1, 141-149.
26. P.KasinathaPandian. ***S.Ramesh***, et.al (2003) Erosion and accretion problems on coastal landforms: A Case study of Ennore coast, North of Chennai City. **Journal of Geomorphology**, v.8, pp.25-34.

27. R.Ramesh, R.Puvaja, ***S.Ramesh*** and R.A.James (2002) Historical Pollution trend in Coastal Environments of India. **Environmental Monitoring and Assessment (Kluwer Publications, The Netherlands)**, v.79, pp.151-176
28. P.KasinathaPandian, S.Ramachandran, ***S.Ramesh***, et.al (2002) Protection of environmentally sensitive areas: A review of Somerset Levels and MOORS, United Kingdom. **Indian Journal of Environmental Protection**, v.22, pp. 1305-1314
29. R.Ramesh, AL.Ramanathan, ***S.Ramesh et.al*** (2000) Distribution of Rare earth elements and heavy metals in the surficial sediments of the Himalayan river system. **Geochemical Journal (Geochemical Society of Japan)**, v.34, pp 295-319
30. ***S.Ramesh*** and S.Ramasamy (2000) Palynodebris accumulation characteristics of a sediment core from the eastern part of Lower Bengal Fan. **Current Science**, v.79, pp.24-26.
31. ***S.Ramesh*** and S.Ramasamy (1997) Rare Earth Element geochemistry of a sediment core from Lower Bengal Fan. **Journal Geological Society of India**, v.50, pp.399-406

Chapters in Books

1. M.A.Atmanand, **S.Ramesh**, S.V.S.Phanikumar, G.Dharani, N,Thulasi Prasad and Sucheta Sadhu, Chapter 17: *CO_2 storage, Utilization Options, and Ocean Applications, In: Carbon capture, storage and Utilization: A possible climate change solution for energy industry.* Ed: MaltiGoel, M, Sudhakar and R.V.Shahi. **The Energy Resource Institute, TERI, 2015.**
2. N Thulasi Prasad, KNVV Murthy, Sridhar Muddada, Sucheta Sadhu, G Dharani, **S. Ramesh,** S. V. S. Phani Kumar, M. B. VenkataRao, A Syamsundar, M. A. Atmanand; **Chapter 7:** Section CO_2 storage in other sites: Ocean Applications for Carbon dioxide Sequestration. In "Geological Carbon Sequestration". **Springer, 2015**.
3. **S. Ramesh**, D. VenkataRao, B. RamalingeshwaraRao, KalachandSain, Oleg Khlystov, M. A. Grachev and S. Kathiroli. *Gas Hydrate Exploration and Sampling in Kukuya Canyon, North of Selenga Delta, Lake Baikal, Russia*. Chapter Seven, Earth Resources and Environment (Edited Book), **Research Publishing, Singapore, ISBN: 978-981-08-6942-7, pp.132-140, 2013.**
4. ***S.Ramesh***and S.Ramachandran**(2001)**Lagoonal Ecosystems of the east coast of India, **In: Chapter 4, Coastal Environment and Management**, (Ed. S.Ramachandran). pp 48-67.
5. S.Ramachandran, **S.Ramesh** and R.Krishnamoorthy**(2000)** Application of Remotesensing and GIS in coastal lagoonal ecosystem: A case study from Pulicat Lake, southern India. **In: Remote-sensing applications to marine sciences** (Ed. S.Ramachandran). pp.333- 343

Patent Filed

1. **S.Ramesh,** N.Vedachalam, G.A.Ramadass and M.A.Atmanand**, (2012) A process and a system for controlled production and collection of methane gas from anunconsolidated marine system. Application number 4234/CHE/2012 A dated 20.11.2012**
2. G A Ramadass, **S Ramesh,** N Vedachalam, AN Subramanian, D Sathinarayanan, R Ramesh G.Harirkrishnan, A.Vadivelan, E. Chandrasekaran, D. Muthukumaran, M. Murugesan, S. Elangovan.**Underwater Polar Remotely operated vehicle (PROVe)",** Application Number: 201841045387, **2019**

Reports Submitted

1. Completion report for **Indo-Russian collaboration for gas hydrate exploration in Lake Baikal under ILTP program**was submitted to DST during December 2007 as co-coordinator
2. Team member in preparation of **completion report for the development of 6000 m depth rated unmanned underwater vehicle (ROSUB 6000)** to MoES during March 2011
3. Team member in preparation of **completion report for the development of 500 m depth rated Polar cum Shallow water Remotely Operated Vehicle (PROVe)** to MoES during December 2017

Affiliation with professional bodies/institutions/societies

Affiliation to Professional Bodies

a. *Executive Council member – Tamilnadu Geologists Association*
b. *Life Member – Ocean Society of India*
c. *Doctoral committee member – Anna University, University of Madras and SRM University*

Countries Visited

a. *Europe - Germany, France, Italy*
b. *Russia – Moscow, Siberia,*
c. *Maldives*
d. *South Africa*
e. *USA*
f. *Antarctica*

STATEMENT OF QUALIFICATIONS

Ramesh Sethuraman

Personal information

Year of Birth: 1968
Place of birth: Chinnasalem, Tamilnadu, India

Academic Qualifications

1998	Ph.D. Marine Geology (University of Madras, India) "Sedimentation and Paleo-climatic conditions of Late Pleistocene – Holocene sediments of the Eastern part of Lower Bengal Fan, Northeast Indian Ocean"
1990	M. Sc. Applied Geology (Bharathidasan University, India)
1988	B. Sc. Geology with Mathematics and Physics (Bharathidasan Univ, India)

Professional Positions held

Since Dec 2020	Scientist G & Scientist In Charge, Deep Sea Technology Group, National Institute of Ocean Technology under Ministry of Earth Sciences, Government of India
2002-2020	Joined as Scientist B and reached Scientst G at National Institute of Ocean Technology under Ministry of Earth Sciences, Government of India
2000-2002	Senior Project Scientist and Project Leader, Institute of Ocean Management, Anna University, India
1998-2000	Junior Project Scientist, Institute of Ocean Management, Anna University, India
1992-1997	Junior and Senior Research Fellow under Department of Ocean Development program of GoI at University of Madras, India based on the qualification obtained in Graduate Aptitude Test for Engineering (GATE 91) and Council of Scientific and Industrial Research, Govt of Inida

Professional Experience

- Legal and Technical Commission (LTC):
  - Nominated Member from India as LTC member for International Seabed Authority since December 2021
- Activities relevant to ISA for deep sea exploration in India:
  - *Polymetallic Manganese Nodule :* Lead member in design and development of deep water work class Remotely Operated Vehicle (ROSUB 6000) development with geo-scientific payloads and gathering, analyzing and documenting all scientific and technical data for understanding the nodule characteristics
  - *Hydrothermal Sulphides*: Lead member in the expedition to hydrothermal sulphides at Central Indian Ridge region for the deployment of ROSUB 6000 vehicle and the collected scientific and technical information with bottom photography was utilized for the initial documentation for India's submission to ISA towards contract approval process.

- *Involved in the training program conducted for the developing nations sponsored by International Seabed Authority during 2019 and 2022 and delivered the lectures on deep sea survey and exploration for deep sea mineral resources*
- *2005-present:* Continued involvement in the Polymetallic Manganese Nodule exploration program of Ministry of Earth Sciences, Govt of India related activities and technology development and demonstration at Central Indian Ocean Basin

Other professional accomplishments:

- *Working Group member in India for International Geological Correlation Program (IGCP)-495 "Quaternary Land – Ocean interactions: Driving mechanisms and coastal responses" - 2004-06*
- *Participated as lead member in 34th Indian Scientific Summer Expedition to Antarctica – during 2015 and successfully deployed and qualified the first Indian underwater vehicle - Polar cum Shallow water ROV (PROVe) in Antarctic water*
- *Lead the gas hydrate expedition team from India to Lake Baikal in Siberia, Russia for summer and winter expedition during 2005 and 2006*
- *DST-DAAD (Indo-German)research scholar under bilateral program during 2001*
- *Associated with Indo Russian Long Term Research Program (ILTP) collaboration program (ILTP) for gas hydrate research*
- *Chief Scientist/ participant scientist* in several marine geological/ geophysical/ deep sea technology/coastal surveys cruises and studies over the past more than 25 years
- *Principal author/co-author* of over 50 publications in journals, books, scholarly presentations made in conferences, seminars and invited lectures.

Awards:

- National Meritorious Invention Awards – 2018 by National Research Development Corporation (Govt of India) for the invention of "Underwater Remotely Operated Vehicle for Polar and Shallow Water Research"
- National Geo-science Award from Ministry of Mines, GoI on February 2012 for the outstanding contribution in the field of Oil and & Natural Gas Discovery and Exploration (Gas Hydrates)