

SCIENTIFIC REPORT  
EIGHTEENTH INDIAN EXPEDITION  
TO ANTARCTICA

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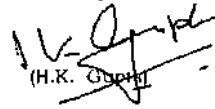
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#### FOREWORD

The Indian Antarctic Programme, multi-institutional and multidisciplinary in nature, has evolved into a sustained scientific campaign to solve various scientific mysteries from the icy continent. Conducting field experiments in Antarctica is challenging, exciting and satisfying. National Centre for Antarctic & Ocean Research (NCAOR), Department of Ocean Development has played a pivotal role in sending annual expedition to Antarctica and providing a unique platform to the Indian scientists to explore new vistas in the pursuit of technical innovation and scientific excellence. By virtue of its sustained interest and demonstrative capabilities in the domain of polar sciences and logistics, India achieved many significant milestones.

Work carried out successfully during the 18<sup>th</sup> Indian Antarctic Expedition (IAE) and the scientific findings are collated in this report. This expedition was the last one launched from the port of Goa (India). Many Scientific Committee on Antarctic Research (SCAR) mounted international campaign are very well reflected in the scientific programmes of this expedition. True to the spirit of the Antarctic Treaty, the 18<sup>th</sup> IAE provided a platform to an Iranian scientist who collaborated with his Indian counterpart in biology.

The present report is an outcome of the commendable efforts of Shri Ajay Dhar, Leader of the 18<sup>th</sup> Expedition. It is hoped that this technical report shall benefit the polar scientific community.

  
(H.K. Gupta)

राष्ट्रीय अंटार्कटिक एवं  
समुद्री अनुसंधान केन्द्र  
(महासागर विकास विभाग  
भारत सरकार)  
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29\* May 2002

#### Preface

I am delighted to know that technical report of the 18<sup>th</sup> Indian Antarctic Expedition is ready for distribution to International Polar Scientific Community. Dr Ajay Dhar. Leader of the 18<sup>th</sup> IAE. Scientist from Indian Institute of Geomagnetism, Colaba. Mumbai has done commendable job in successfully completing the assigned task of logistics and science. The technical report truly reflects the multi-disciplinary scientific tasks accomplished by scientific community of various institutions in India. The participation of an Iranian Scientist has been mutually beneficial and is in the spirit of international co-operation under Antarctic Treaty System.

"Maitri" the signature of India in Antarctica is maintained by various organisations in the country. It is a matter of pride that the Station is providing fertile scientific platform to many national and international scientists to conduct innovative and longterm monitoring programs in various domains of polar sciences. It has been our endeavour to protect and preserve the pristine Antarctic environment while contributing to the global efforts of generating knowledge about the icy continent. In addition to the experiments conducted in Antarctica, scientists from NCAOR and Space Application Centre Ahmedabad are using OCEANSAT Data for global change studies by monitoring sea-ice conditions in Antarctica. Only an integrated approach will lead us for better understanding of the processes modulating regional and global climate. The technical report will provide a valuable input to the effort.

(Prem Chand Pandey)

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## *THE TEAM*

S.NO.	NAME	ORGANISATION
<b>XVI WINTER TEAM (Jan 1999–Feb 2001)</b>		
1.	Shri Ajay Dhar Leader & Station Commander	Indian Institute of Geomagnetism
2.	Shri Praveen Srivastava	Snow Avalanche & Study Establishment
3.	Dr. Saurabh Baruah	National Geophysical Research Institute
4.	Shri RP Lai	India Meteorological Department .
5.	Shri L Krishnamurthy	India Meteorological Department
6.	Shri K.h. Gajananda	National Physical Laboratory
7.	Shri V S Shinde	Research & Development Establishment (Engrs)
8.	Shri R K Pandkar	Research & Development Establishment (Engrs)
9.	Shri H K Gaur	Defence Electronic Applications Laboratory
10.	Shri Som Prakash	Defence Electronic Applications Laboratory
11.	Dr. S Kanagamani	Indian Railways
12.	Dr. U S Nag	Indian Railways
13.	Maj. VV Kadam	Indian Army
14.	Capt. R V Vasant	Indian Army
15.	Sub. MC Sharma	Indian Army
16.	Nb. Sub. Surjit Singh	Indian Army
17.	Nb. Sub. RV Khatri	Indian Army
18.	HMT. Naresh Kumar	Indian Army
19.	Hav. RB Singh	Indian Army
20.	Hav. Dilbag Singh	Indian Army
21.	HMT. Sita Ram	Indian Army
22.	HMT. Elicius Soreng	Indian Army
23.	Hav. Narayan Singh	Indian Army
24.	Hav. Jaswinder Singh	Indian Army
25.	NK. P R Bishnoi	Indian Army
26.	Shri Mohan Singh	ITBP

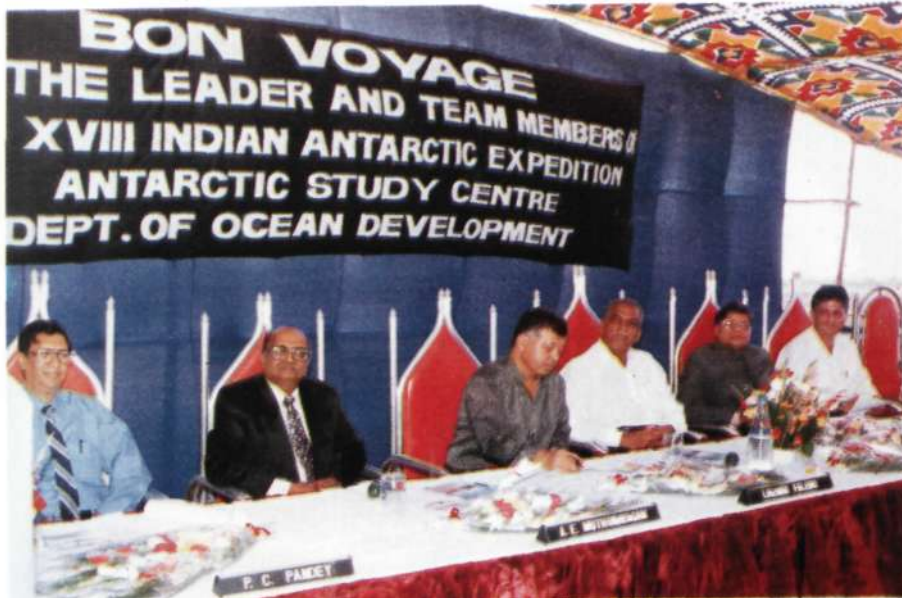


**SUMMER TEAM:**  
(Jan 1999–March 1999)

1. Shri M P Gaur	Geological Survey of India
2. Shri R Asthana	Geological Survey of India
3. Shri ADharwadkar	Geological Survey of India
4. Shri S Dutta	Snow Avalanche & Study Establishment
5. Shri K Sharma	Survey of India
6. Shri R Kumar Das	Survey of India
7. Shri Y B S N Murthy	National Geophysical Research Institute
8. Dr. (Mrs) Girija Rajaram	Indian Institute of Geomagnetism
9. Shri K Emperumal	Indian Institute of Geomagnetism
10. Shri V S Nadkarni	National Physical Laboratory
11. Dr. S Kumar	Barkatullah University
12. Dr. (Mrs) M Mehta	All India Institute of Medical Sciences
13. Dr. (Ms) K Kapila	All India Institute of Medical Sciences
14. Shri T P Baburaj	Defence Institute of Physiology and Allied Sciences
15. Dr. A Husain	Zoological Survey of India
16. Shri RK Gupta	Botanical Survey of India
17. Shri P W Ramteke	Industrial Toxicology Research Centre
18. Shri A K Saran	National Institute of Oceanography
19. Dr. Pradeep Kumar	Roorkee University
20. Shri N D Angal	Research & Development Establishment (Engrs)
21. Shri G Velayutham	Research & Development Establishment (Engrs)
22. Shri V D Sharma	Defence Electronic Applications Laboratory
23. Shri T Ramesh	National Aerospace Laboratories
24. Lt. Cdr. J J Pathur	National Hydrographic Office
25. Lt. Cdr. S Mani	National Hydrographic Office
26. Shri K Kumar	National Hydrographic Office
27. Shri K U Kumar	National Hydrographic Office
28. Dr. Mohammad Reza Shakri	Iranian National Center for Oceanography, IRAN
29. Shri Jagveer Singh	Indo Tibetan Border Police
30. Dr. N Khare	D. O. D Observer.

## **ADDRESSES OF PARTICIPATING ORGANISATIONS**

1. Indian Institute of Geomagnetism, Dr. Nanabhoy Moos Marg, Colaba, Mumbai - 400 005.
2. Geological Survey of India. Antarctic Division, NH-5 P, N. I. T, Faridabad-121001.
3. India Meteorological Department. Mausam Bhavan, Lodhi Road, New Delhi-110 003.
4. National Physical Laboratory, Dr. K. S. Krishnan Marg. New Delhi-100012
3. Snow and Avalanche Study Establishment, Manali, Himachal Pradesh.
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- 7, National Geophysical Research Institute, Uppal Road, Hyderabad-500 007.
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9. Defence Institute of Physiology and Allied Sciences, Lucknow Road, Timarpur, NewDelhi-110054.
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- ,13. BotanicalSurveyofIndia, P-8, BarboumeRoad, Calcutta-700001.
14. Dept.ofPhysics, Barkatullah University, Bhopal-462 026.
15. National Aerospace Laboratories, PB 1779, Kodihalli, Bangalore-560 017.
16. Industrial Toxicology Research Centre, PB No. 80, M. G. Road, Lucknow-226 001.
17. Dept. of Civil Engineering, University of Roorkee, Roorkee - 247 667.
18. National Institute of Oceanography, Dona Paula, Goa-403 004.
- . 19. National Hydrography Office, PO Box 75, Dehradun-248 001.
20. Directorate of Military Operations (M02), Army Headquarters, Sena Bhavan. New Delhi.
- ,21. Indo Tibetan Border Police, Block-2, C G O Complex, Lodhi Road, NewDelhi-100 003.



The XVIII Indian Antarctic Expedition being launched from NCAOR, Goa by Hon. Chief Minister of Goa Mr. Luizinho Faleiro, in the Presence of Secretary DOD, Centre Director NCAOR and various other dignitaries.



The Hon. Chief Minister with Center Director NCAOR & Team Members

XVIII



The Chief Minister and the dignitaries taken on a tour of the ship Polar Bird

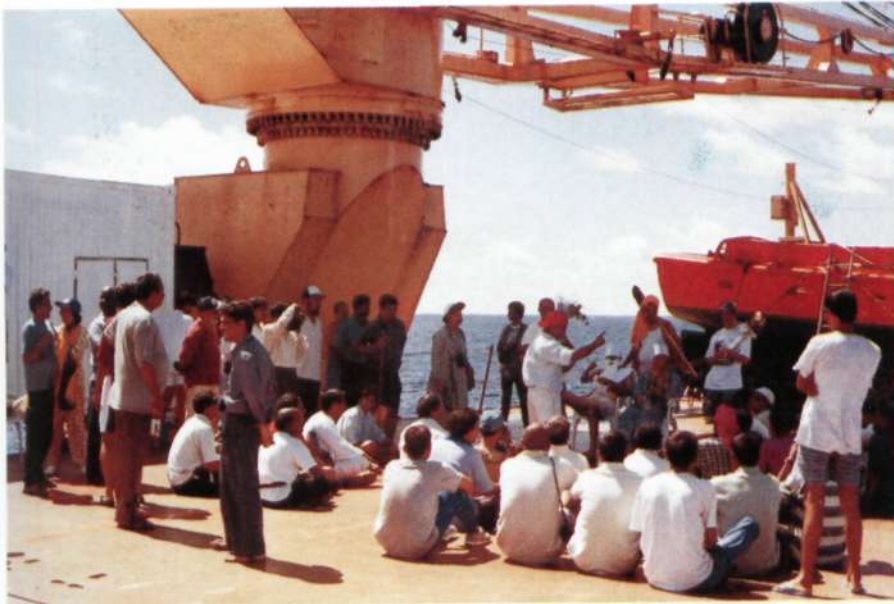


The XVIII expedition team members onboard Ship.





Members participating in the Ship's safety drill.



Equator crossing ceremony onboard the Ship.

XX



Scientific lectures were organized to keep members occupied onboard the Ship and to discuss the ongoing scientific programs.



A Check Helicopter was gifted by Indian Government to Mauritius Government. The Helicopter being handed over to Mauritius Team on board the vessels.



Pawan Hans Helicopters Participated for the First time in Indian Antarctic Expedition.  
The ground testing of two Helicopter in progress.



A Sun set over the Antarctic Ocean.



XXIV



Automatic weather station (AWS) set up on Polar Ice at Sankalp Point



With the Leader (Mr. Vladimir Bol'Shakov) and team members of 44<sup>th</sup> Russian Antarctic Expedition at Novalazarevskaya station.





A huge tabular Iceberg.



The Ship MV Polar Bird along side the ice shelf.





A Pair of Emperor Penguins.



A seal over the ice shelf





Automatic weather station (AWS) set up on Pólar Ice at Sankalp Point



With the Leader (Mr. Vladimir Bol'Shakov) and team members of 44<sup>th</sup> Russian Antarctic Expedition at Novalazarevskaya station.