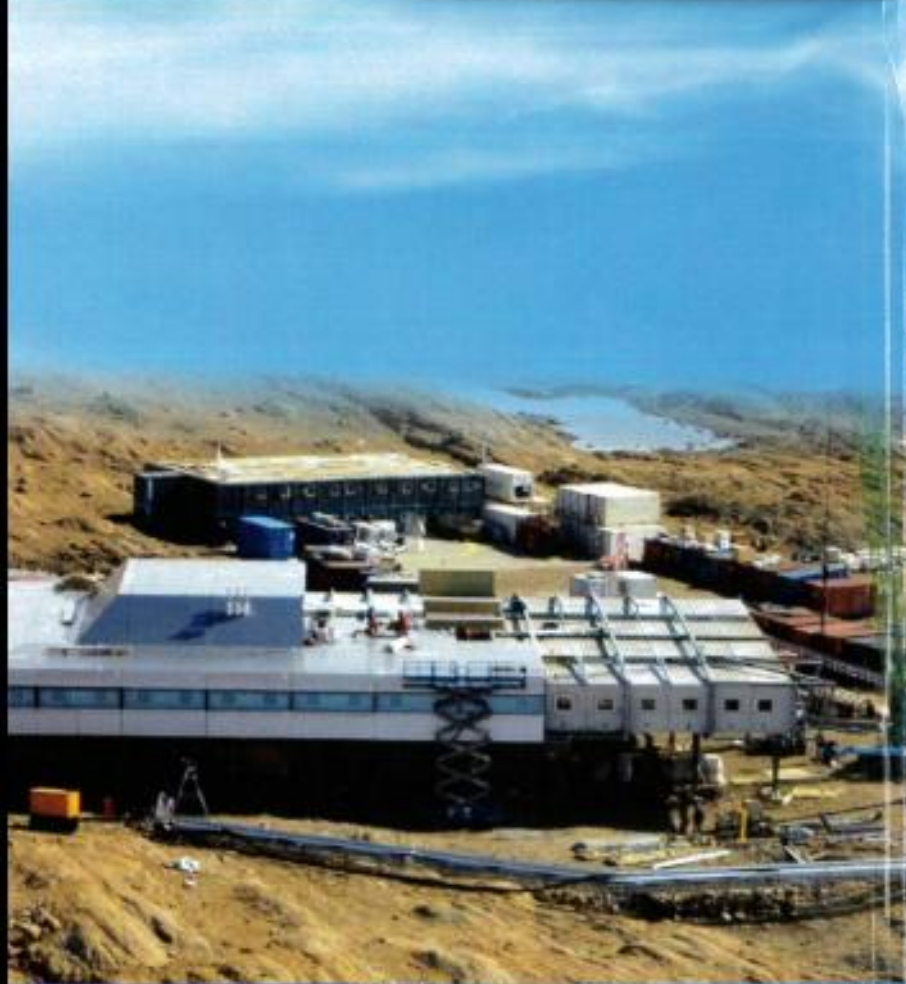




National Centre for Polar & Ocean Research
 (Formerly National Centre for Antarctic and Ocean Research)
 Earth System Science Organization, Ministry of Earth Sciences,
 Headland Sada, Vasco-Da-Gama- 403 804 Goa

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SCIENTIFIC REPORT OF THIRTIETH INDIAN EXPEDITION TO *ANTRACTICA*



NATIONAL CENTRE FOR POLAR & OCEAN RESEARCH
 (Formerly National Centre for Antarctic and Ocean Research)
 Earth System Science Organization, Ministry of Earth Sciences,
 Headland Sada, Vasco-Da-Gama- 403 804
 Goa

Shri K. Jeeva, Technical Officer-IV at the Indian Institute of Geomagnetism (IIG) has been associated with the Indian Antarctic Program since 1991. He was posted at Equatorial Geophysical Research Laboratory, Tirunelveli, a Regional Centre of Indian Institute of Geomagnetism (IIG). He participated in six Indian Scientific Expeditions to Antarctica (ISEA) as a winter over member. Among them he was designated as a Leader & Station Commander for three expeditions at Maitri.

During the 11th ISEA, Shri Jeeva established spaced magnetic observatories, to estimate the velocity of Antarctic upper atmospheric currents. He studied geomagnetic activity, and its impact on HF communication between Maitri and New Delhi to predict the HF communication signal quality.

The music talents in him helped his teams to have melodious winter life in Antarctica in all the expeditions he participated.



Scientific Report of Thirtieth Indian Antarctic Expedition

Technical Publication No. 28



सत्यमेव जयते

National Centre for Polar & Ocean Research
(Ministry of Earth Sciences)
Headland Sada, Vasco—Da—Gama, Goa – 403 804
2025

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सत्यमेव जयते

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Foreword

The 30th Indian Scientific Expedition to Antarctica (ISEA) represents a remarkable chapter in India's long-standing engagement with the icy expanse of Antarctica. For nearly thirty years, India has maintained a robust presence on the continent, rooted in rigorous scientific research, a steadfast commitment to environmental preservation, and a goal of deepening our comprehension of this unique and vital region.

One of the standout achievements of this expedition was India's inaugural journey to the South Pole. This historic event was led by Dr. Rasik Ravindra, who served as the director of the National Centre for Antarctic and Ocean Research (NCAOR, now known as NCPOR). This pioneering journey celebrated the centenary of Roald Amundsen's iconic expedition to the South Pole, marking a significant milestone in India's Antarctic exploration history.

In addition to its scientific endeavours, the 30th ISEA included a significant expedition to the Larsemann Hills. This undertaking was part of the first phase of constructing India's third research base in Eastern Antarctica, highlighting India's sustained investment in expanding its research infrastructure on the continent.

The presence of notable figures such as Dr. Ajit Tyagi, Director General of Meteorology, and Dr. Sheno, Director of INCOIS, at Maitri highlighted the expedition's strategic importance. Their visit underscored the commitment of the Indian authorities to enhance the scientific impact of the country's efforts in Antarctica.

Spearheaded by Sh. K. Jeeva, this diverse expedition achieved notable successes in both logistics and scientific research within its planned timeframe. The comprehensive technical report detailing the accomplishments of the 30th ISEA stands as a testament to the dedication and skill of all involved.

Congratulations are in order for the entire expedition team and the contributors of the report for their significant achievements. Their efforts have not only cemented India's foothold in Antarctica but also paved the way for future advancements in this critical field of study.


(M. Ravichandran)



राष्ट्रीय ध्रुवीय एवं समुद्री अनुसंधान केन्द्र

पृथ्वी प्रणाली विज्ञान संगठन

पृथ्वी विज्ञान मंत्रालय (भारत सरकार)

हेडलैण्ड सडा, वास्को-डा-गामा, गोवा-४०३ ८०४, भारत



NATIONAL CENTRE FOR POLAR AND OCEAN RESEARCH

Earth System Science Organisation

Ministry of Earth Sciences, (Government of India)

Headland Sada, Vasco-da-Gama, Goa - 403 804, INDIA

Preface

This technical report synthesizes the scientific and logistics accomplishments of XXX Indian Scientific Expedition (ISEA) to Antarctica during the year 2010-2011 under the leadership of Sh. K. Jeeva.

The XXX ISEA was a landmark expedition, accomplishing its scientific and logistic objectives while supporting the historic South Pole mission. The South Pole team, led by then NCAOR (now NCPOR) Director Dr. Rasik Ravindra, became the first Indian team under the Indian Antarctic Program to reach the geographic South Pole. The team also collected snow samples en-route their journey to the South Pole.

The Maitri and voyage teams demonstrated exceptional dedication in handling the complex task of off-loading cargo and fuel from the icebreaker. Due to thick fast ice in the India Bay area, the logistic team camped on the ice shelf for 11 consecutive days and transport the convoy to the icebreaker, moored 5 km away from the usual berth.

Scientific achievements at Maitri included improvements in the data quality of the imaging riometer, VLF experiment, and lonosonde; resumption of ozone vertical profile and RMS observations; and the installation of a high-speed anemometer.

The voyage team, under the leadership of Sh. Rajesh Asthana, visited Larsemann Hills, the site for India's third research station. They advanced the station's construction and carried out critical scientific tasks, including preliminary studies for remote sensing and communication antennas, hydrographic surveys for bathymetric analysis, data collection for Environmental Impact Assessment, and topographical mapping of the area. Documentation of the construction process was also initiated.

I extend my gratitude to Sh. K. Jeeva and his team for their exemplary efforts during the expedition. My sincere thanks to the then Director, Dr. Rasik Ravindra, Dr. Rahul Mohan, NCPOR, and Sh. K. Jeeva for their meticulous compilation and editing of this report, ensuring its high quality and precision.

Dr. Thamban Meloth

The Team

30th Indian Scientific Expedition to Antarctica (2010-2011)

Sr. No	Name	Organization
Wintering Team		
1.	Shri K Jeeva, Leader & Station Commander	IIG
2.	Shri Shankar Prasad, Scientist	IMD
3.	Shri Ashok D. Khutwad, Scientist	IMD
4.	Sunil Kumar Singh, Scientist	NPL
5.	Shri Prabhat Kumar Sahoo, Scientist	SASE
6.	Dr. (Ms) P. Madhumita, Medical Officer	NCAOR
7.	Dr. (Ms) Tarulata Anil Sable, Medical Officer	NCAOR
8.	Shri Bhupender Singh, Scientist	DEAL
9.	Shri Vikram Waghmode, Charge Mechanic	BRO
10.	Shri Ram Pal Singh, Charge Mechanic	BRO
11.	Shri G. K. Menon, Charge Mechanic	BRO
12.	Shri Jagdish Prasad, Charge Mechanic	BRO
13.	Shri Gawari Sanjay Tukaram, Carpenter	BRO
14.	Shri A.K.M. Shahare, Welder	BRO
15.	Shri Nandal Sarjit Singh, Station Electrician	NCAOR
16.	Shri Harjinder Singh, Vehicle Mechanic	NCAOR
17.	Shri Satender Singh, Vehicle Mechanic	NCAOR
18.	Shri. Devi Singh, Vehicle Mechanic	NCAOR
19.	Shri Arun Kumar, Electrician	NCAOR
20.	Shri Rahul Tomar, Boiler operator	NCAOR
21.	Shri Sanjeev Kumar, OEM	NCAOR
22.	Shri Ram Singh, Plumber	NCAOR
23.	Shri Vijay Kumar, Cook	ITBP

Summer Team to Maitri and Bharati

1.	Shri Rajesh Asthana, Voyage Leader	GSI
2.	Shri Amit Mandal, Geologist	GSI
3.	Ashit Kumar Swain, Geologist	GSI
4.	Shri Rahul Rawat, Scientist	IIG

5.	Shri Anoop K. S., Scientist	IIG
6.	Shri A. Nageswara Rao, Scientist	NGRI
7.	Lt. Cdr Md. Asad Farhaat, Hydrographer	NHO
8.	Shri Nitin Singh, Hydrographer	NHO
9.	Shri Ashwani Acharya, Scientist	SASE
10.	Shri Bala Manikavelu, Scientist	NRSC
11.	Shri V. Sree Ramulu, Scientist	NRSC
12.	Dr. Pawan Kumar Bharati, Scientist	SIIR
13.	Shri Pankaj Mishra, Scientist	SOI
14.	Shri K. M. Pant, Scientist	SOI
15.	Shri R. K. Das, Scientist	SOI
16.	Shri Dalbir Singh, Scientist	SOI
17.	Shri Surendra Singh Gusain, Scientist	SOI
18.	Shri Gopi Chand, Scientist	SOI
19.	Shri Jagdish Kumar, Communication Officer	DEAL
20.	Shri J.A.A. Silveria, Engineer	MPT
21.	Dr. (Ms). Mamatha M. Lala, Medical Doctor	NCAOR
22.	Shri Rakesh Rao, Scientist,	NCAOR
23.	Shri Jaspal Singh Negi, Cook	ITBP
24.	Shri Suresh Kumar, Cook	ITBP
25.	Shri Ajai Pal Singh, Carpenter	BRO
26.	Shri Hoshiar Singh, Mason	BRO
27.	Shri P. T. Antony, EE Mech	BRO

Members of First Scientific Expedition to South Pole

1.	Dr. Rasik Ravindra, Leader, South Pole Expedition team	NCAOR
2.	Shri Ajay Dhar, Scientist	IIG
3.	Shri Mirza Javed Beg, Scientist	NCAOR
4.	Dr. Thampan Meloth, Scientist	NCAOR
5.	Dr. Pradip Malhotra, Chief Medical Officer	CGHS
6.	Shri Ashit Kumar Swain, Geologist	GSI
7.	Shri. K. Krishnamoorthy, Vehicle Electrician	NCAOR
8.	Shri. Surat Singh, Vehicle Mechanic	NCAOR

Addresses of Participating Organisations

1. National Centre for Antarctic and Ocean Research, Headland Sada, Vasco-da-Gama, Goa -403 804
2. Geological Survey of India, Antarctica, Division, NJ 5P, N I T, Faridabad-121 001
3. Indian Institute of Geomagnetism, Plot No 5, Sector-18, New Panvel (West), Navi Mumbai -410 218
4. India Meteorological Department, Mausam Bhawan, Lodhi, Road, New Delhi-110 003
5. National Physical Laboratory, Dr. K. S. Krishnan Marg, New Delhi 110 012
6. National Geophysical Research Institute, Uppal Road, Hyderabad-500 007
7. Survey of India, 17 E C Road, P. B. No. 77, Dehradun-248 001
8. National Hydrographic Office, P B No75, 107, Raipur Road, Dehradun, 248 001
9. Defence Application Electronics Laboratory, P. B. No54, Raipur Road, Dehradun, 248001
10. Indo Tibetan Border Police, Block No. 2, CGO Complex, Lodhi Road, New Delhi-110003
11. Shriram Institute of Industrial Research, 19, University, Road, Delhi-110007
12. Snow and Avalanche Study Establishment, Plot No. 1, Sector 37-A, Himaparishar, Chandigarh-160 036
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