

MEMBER COUNTRY: P.R. China
National Report to SCAR for year: 2007-08

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A BRIEF SUMMARY OF SCIENTIFIC HIGHLIGHTS

1. Introduction

The 24th Chinese National Antarctic Research Expedition (CHINARE-24, 2007/2008) was composed of 188 personnel_including 56 Chinese scientists. In the early of Dec. 2007, some of the team member flew to Antarctica ,and others went there by Chinese vessel “Xuelong”. The over-wintering team of CHINARE-23 and the summer team of CHINARE-24 returned to China in the end of May, 2008.

	Great Wall Station		Zhongshan Station	
	Summer Season	Over-wintering	Summer Season	Over-wintering
Scientists	7	2	16	7
Logistic Personnel	23	17	21	13
Others	82			
TOTAL	188			

2.Stations in Antarctica

Wintering Station

Name	Location	Coordinates
<i>Great Wall</i>	King George Island	62°12'59_S 58°57'52_W
<i>Zhongshan</i>	Larsemann Hills	69°22'24_S 76°22'40_E

3. Main scientific activities

National Programs/Projects by Working Group 2007/2008

Geodesy and Geographic Information

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Surveying	2008 International Epoch GPS Campaign	Great Wall	2007/2008(S)	Shen Qiang	1

Physics and Chemistry of the Atmosphere

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Meteorology	Observation	Great Wall	2007/2008	Xing Chuang	2
AVHRR	Receiving	Great Wall	2007/2008	Huang Haodong	2
Meteorology	Observation	Zhongshan	2007/2008	Li Fuhu	2
AVHRR	Receiving	Zhongshan	2007/2008	Wang Hua	2
Sea Ice	Observation	Zhongshan	2007/2008	Wang Hua	2
Ozone	Observation	Zhongshan	2007/2008	Zhang Hongjie	2
UAP	Recording	Zhongshan	2007/2008	Hu Guoyuan	3

Geomagnetism

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Geomagnetism	Recording	Zhongshan	2007/2008	Yang Lei	4

Other Programs/Projects

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Traverse	Sampling	Dome A	2007/2008	Sun Bo	5

(S)= Summer project only

The list of principal investigators & responsible authorities 2007/2008

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Major Progress and Results of Polar Scientific Projects 2007/08

The Chinese 24th Antarctic inland traverse team with 17 members, equipped with 5 snow vehicles, 13 sledges and carried with 175 ton logistic material, set out from Zhongshan station on Dec. 22, 2007, and returned on Feb. 9, 2008. The expedition totally spent 50 days. In the whole field campaign, the expedition team implemented all expedition tasks successfully, and achieved many high-quality results, involving on Dome A scientific investigation, inland station pre-site survey, Chinese Antarctic ice-sheets expedition capability construction. The expedition largely improved the operation capability on Antarctic ice-sheets, advanced the application of high and new techniques and achieved much more experience which is beneficial for future Antarctic operations.

The equipments of inland expedition this year were the greatest in the history. It's the second time to reach Dome A, representing the improving and strengthening of Chinese Antarctica research ability. CHINARE can arrive anywhere of Antarctic ice-sheets now. In Dome A region, the largest-scale science research work by far was performed. Especially, multi-disciplinary science research and inland station locating work was systematically carried out along Zhongshan-Dome A traverse, on the boundary of the central 6000 km² region of Dome A and in more central 900 km² areas. The works have acquired great progress.

Space Physics

A. At the Yellow Station in the Arctic, all-sky multiple-band aurora imaging observation system was made possible to practice for the first time in the international community the real-time observation of three-aurora-feature-spectrums.

B. HF radar data were applied to study the dayside high-latitude reconnection events when the interplanetary magnetic field was strongly northward. It is confirmed that the high-latitude reconnection is pulsed. Ionospheric flow bursts observed in the postnoon sector on closed field lines were confirmed to be related with this pulsed reconnection. These phenomena were conjugate between both hemispheres. Seasonal features of the ionosphere for different solar activities at Zhongshan station, Antarctica, have been obtained. A three-dimensional, time-dependent high-latitude ionosphere model has been developed for the study of the high-latitude space weather phenomena.

Biology and Life

The historic information of human civilization has been found existing in the seal feather and life form dung and dirt in the Antarctic. Hg content fluctuation has been seen in noticeable corresponding relationships with human metallurgy civilization.

Efforts have been made to renew the study of relationships between the number of Arctic sea birds at Ny Alsend area over the past 2000 years and snow-melting speed rate. It has been noted that the number of Arctic seagulls has undergone five significant fluctuations, which was in correspondence with the rise and fall of air temperatures. It has suggested that relatively high or low temperature is not conducive to the seabird growth.

Oceanography

The study of Interaction of Prydz Bay water mass and circumfluence with ice shelf in the Antarctic has made the following progress and development:

1 acquiring the temperature variation curve along the ice shelf drilling hole, density variation curve, isotope composition layout of source ice layer of the ice shelf, and sea ice chemical component layout.

2 the specific features of the central ice layer structure of the ice shelf have been acquired, while the movement rate of ice shelf toward the sea has recorded 800m per annum.

3 The study taken at the waters of the front edge of Amery Ice Shelf, Prydz bay, the LADCP, CTD information and underwater videotaping have shown that there is existence of ice shelf water at the temperature lower than $-1.9 \text{ }^{\circ}\text{C}$ at the waters of the front edge of the ice shelf I in the summer season, evidencing that there is a narrow and warm current flow at the front edge of Amery Ice Shelf, and a east-west water flow at the middle of the said front edge. It has been discovered that there is also a relatively warm bottom-level current along the ice shelf front edge and under the ice shelf.

4 The studies of Prydz Bay continental shelf water composition and features show that there are five central water masses at the Prydz Bay continental shelf zone, namely Antarctic summer surface water, Prydz Bay continental shelf water, Amery Ice Shelf water, metamorphic Antarctic Circumpolar Water and Prydz Bay deep water.