

MEMBER COUNTRY: P.R. China

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ACTION GROUPS						
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NATIONAL ANTARCTIC DATA CENTRE						
National Arctic and Antarctic Data Center of China						
SCAR DATABASE						
insert name of database for which your country has responsibility						
National Arctic and Antarctic Data Center of China						

A BRIEF SUMMARY OF SCIENTIFIC HIGHLIGHTS:**National SCAR Committee**

Title Chinese Advisory Committee for Polar Research

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SCIENTIFIC HIGHLIGHTS**1. Introduction**

The 29th Chinese National Antarctic Research Expedition (CHINARE-29, 2012/2013) was composed of 241 personnel, including 50 Chinese scientists. In the early of NOV. 2012, some of the team member flew to Antarctica, and others went there by Chinese vessel "Xuelong". The over-wintering team of CHINARE-28 and the summer team of CHINARE-29 returned to China on April 9th, 2013.

	Great Wall Station		Zhongshan Station		Kunlun Station
	Summer Season	Overwintering	Summer Season	Overwintering	Summer Season
Scientists	24	3	7	7	9
Logistic Personnel	11	10	24	20	17
Others	106				
TOTAL	241				

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

Summering Station

Name	Location	Coordinates
<i>Kun Lun</i>	Dome A	80°25'01" S 77°06'58" E

3. Main scientific activities - *The People's Republic of China*

National Programs/Projects by Working Group 2012/2013

Geodesy and Geographic Information

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Surveying	2012 International Epoch GPS Campaign	Great Wall	2011/2012		1

Physics and Chemistry of the Atmosphere

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Meteorology	Observation	Great Wall	2011/2012	Xu Cong	2
AVHRR	Receiving	Great Wall	2011/2012	Xu Cong	2
Meteorology	Observation	Zhongshan	2011/2012	Tian Zhongxiang	2
AVHRR	Receiving	Zhongshan	2011/2012	Tian Zhongxiang	2
Ozone	Observation	Zhongshan	2011/2012	Li Delin	2
UAP	Recording	Zhongshan	2011/2012	Liu Junming	3

Geomagnetism

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Geomagnetism	Recording	Zhongshan	2011/2012	Huai Shouchun	4

Other Programs/Projects

Subject	Investigation	Locality	Duration	Principal Investigator	Add
Traverse	Sampling	Dome A	2012/2013	Shi Guitao	5

(S)= Summer project only

The list of principal investigators & responsible authorities 2012/2013

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3. Mr. Hu Hongqiao Polar Research Institute of China No.451, Jingqiao Rd. Shanghai City	4. Mr. Ning Baiqi Institute of Geology and Geophysics Chinese Academy of Sciences No.11, Datunlujia Rd. Chaoyang District, Beijing 100101
5. Mr. Li Yuansheng Polar Research Institute of China No.451, Jingqiao Rd. Shanghai City	

Major Progress and Results of Polar Scientific Projects 2012/13

Earth Science

(1) Ice Core Dating by Volcanic Record Signals

Ice core dating by volcanic signal record was conducted. The mean accumulation rate and the detailed history of volcanism covering the last 2840 years were constructed at Dome A (DA2005 ice core), East Antarctica. Comparisons with previous Antarctic ice-core volcanic records were made to assess the quality of this new DA2005 record. In terms of dates for volcanic events, the DA2005 record was in good agreement with previous records in the second millennium AD (AD 1000–1998). A series of volcanic signatures was found in both the DA2005 record and several other Antarctic ice-core records in the first millennium AD (AD 1–1000), which might appear to validate the DA2005 record during this time period.

(2) Research on Biogeochemistry Process and Subglacial Environment

Biogeochemistry process, which combines the biology with geochemistry, provides a new way to explain the existence of microbe in subglacial environment and their impact on the global climate change. Aiming at research blankness and hotspot in this field, the latest progress of research was reviewed in the application of biogeochemistry to explore the subglacial environment, such as microbial survival in subglacial environment, the release of greenhouse, paleoclimate mutation exploration, and life exploration in other planet.

(3) Satellite altimetry gravity abnormality inversion in the Antarctic Oceans

The subwaveform threshold, as a new method of satellite altimetry waveform retracking, is put forward. With the subwaveform threshold, the gravity anomaly field of the Antarctic Oceans is estimated using satellite altimetry data of ERS-1/GM and Geosat / GM, etc. In the meantime, the methods of Beta-5, the threshold and the subwaveform threshold are compared by the standard deviation of the contiguous remaining sea surface height along tracks, the standard deviation between the altimetric gravity anomaly and the gravity anomaly measured by ship based on the tide data and the shipmeasured gravity anomaly.

Life Science

(1) Finding an Antarctic bacterial novel species of a novel genus

A novel Gram-negative, non-motile bacterium, designated strain ZS2-28(T), was isolated from sandy intertidal sediment samples collected from the coastal regions of the Chinese Antarctic Zhongshan Station on the Larsemann Hills, Princess Elizabeth Land, East Antarctica. On the basis of its phylogenetic position, as well as its phenotypic and chemotaxonomic characteristics, strain ZS2-28(T) represents a novel species of a novel genus, for which the name *Roseicitreum antarcticum* gen. nov., sp. nov. is proposed. The type strain is ZS2-28(T) (= CGMCC 1.8894(T) = LMG 24863(T)).

(2) Experiments on sea ice parameterization and sea ice simulation base on the polar ice-ocean coupled model and Sea ice/snow high resolution thermodynamics model (HIGHTSI)

Based on the MITgcm and grid nesting techniques, sea ice modeling of the Antarctic was studied, and nested high resolution (eddy-resolving) Prydz bay sea ice-upper ocean simulation was implemented. Comparative analysis of the sea ice characteristics around the Prydz Bay from 2000-2009 revealed the possible mechanism of the severe ice condition in 2008 during the Antarctic expedition.

(3) Phylogenetic diversity of dinoflagellates in polar regions

The genotype analysis of dinoflagellates of the samples from the Antarctic and the Arctic surveys was compared. Results showed the genotype of dinoflagellates in the Antarctic winter sample was different from that of the Arctic summer sample in 2007. Diverse genotypes were recorded for the summer season in Kongsfjorden (high Arctic) whilst a single novel genotype of dinoflagellate was recorded from winter samples from the Antarctic Ocean. Data from ice cores suggests that this single dinoflagellate genotype was adapted to extreme cold and clone library screening found that it was occasionally the only microbial eukaryotic genotype found in winter ice cores.

Physical Science

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(2) Research on the Amery ice shelf polynya in the Antarctic

The distribution and variation of the polynya were studied based on the numerical model and remote sensing data. It revealed the existence of huge polynya with no ice or thin ice in front of the Amery ice shelf. Figure 1 compared the space characteristics of the polynya and the ice velocity with AVHRR data and the time evolution of the polynya was shown, it showed that the model captured most of the polynya variation.

(3) The response to the dayside reconnections in the polar ionosphere

The observation data from Cluster satellite and Double Star between 09:00 and 12:00 UT on 11 February 2004 were analyzed. A number of flux transfer events(FTEs) were observed with characteristic of a bipolar signature in magnetic field data and mixing of magnetosheath and magnetospheric plasma populations, while the Cluster spacecraft array moved outbound through the northern, high-altitude cusp and dayside high-latitude boundary layer, and the Double Star TC-1 spacecraft was crossing the dayside low-latitude magnetopause into the magnetosheath south of the ecliptic plane. The results showed that the FTEs became more clear with larger variations of magnitude when it was observed near the magnetopause and in the magnetosheath.