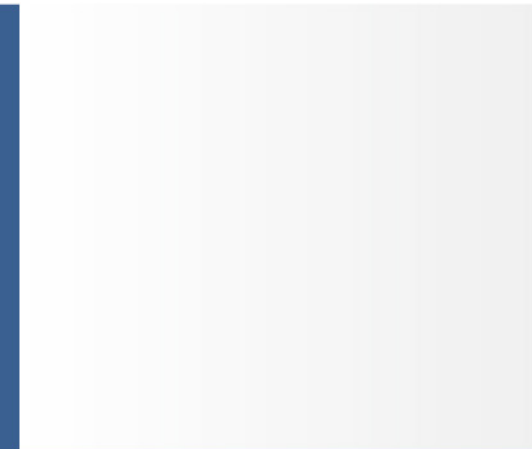


Newsletter

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Chinese Academy of Sciences



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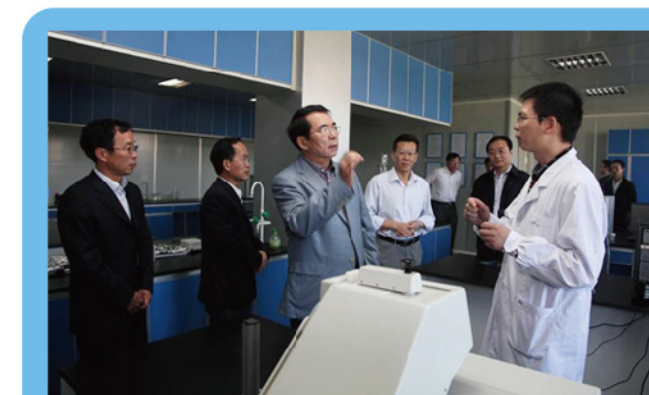
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NEWS

► CAS President BAI Chunli visits Tibet

CAS President BAI Chunli inspected ITP's Lhasa campus in the Tibet Autonomous Region (TAR) August 14-19, 2012. BAI was given a full report in promotion of ITP's 5-year research plan by ITP director YAO Tandong as well as tours of both ITP key laboratories in Lhasa, those of Tibetan Environment changes and land surface processes (TEL) and Continental Collision and Plateau Uplift (LCPU). In addition to inspecting the campus facilities in TAR, Bai also visited several field sites, including ITP field stations Southeast Tibet Observation and Research Stations for Alpine Environment (SETORS) and Qomolangma Atmospheric and Environmental Observation and Research Station (QOMORS), as well as Institute of Geographical Sciences and Natural Resources Research (IGSNRR) Integrated Station for Alpine Ecology at Lhasa and three sites at-risk to geological hazards at Zhangmu, Xigazi.



President BAI, accompanied by ITP directors, is talking with TEL laboratory technician about the machine operation status in Lhasa.

In guiding ITP's further development, President Bai beseeched ITP to center its research on Plateau uplift and its influences on climate and environment in Asia and the northern Hemisphere. He encouraged ITP scientists to devote more effort towards Tibetan Plateau research innovation, and take an active role in cooperative, international study of the Tibetan Plateau environment.

How to apply scientific research and further promote regional sustainability in Tibet was one of the major topics

discussed during Bai's visit. Bai asked that ITP increase collaboration with other CAS research institutes to identify the needs of the local government in Tibet, and to pay special attention to environmental hazards mitigation and ecology protection. He highlighted the CAS principal of helping to promote the development of Tibet, which is "to provide knowledge, talents and scientific techniques".

While inspecting field stations, President Bai expressed his respect and approval of the staff working in remote areas on the Plateau. He emphasized the need to apply academic achievement and attract talents to upgrade the field stations to the national level. "An advantageous research force within CAS should be integrated and a team of high-level researchers should be cultivated to help realize a sustainable development of science in Tibet," He said.



President BAI is shaking hands with work staff at QOMORS.

Along with President Bai, CAS officials accompanying the delegate to Tibet were CAS secretary-general, deputy secretary-general, head of the CAS Bureau of Science and Technology for Resource and Environment, and directors of ITPCAS, IGSNRR and Institute of Mountain Hazards and Environment (IMHE). The CAS delegation was received and warmly welcomed by TAR high-level officials.

► ITP granted more funding from NSFC in 2012

ITP scientific staff applied for, and were awarded, a total of RMB 27.16 million in funding from the National Natural Science Foundation of China (NSFC) for 31 programs.



Among the 31 programs, 18 fall under the general category, while 9 are Young Scientists Funds ranging from alpine biology, hydrology, geomorphology, geotectonic and geophysics on the Tibetan Plateau. In addition, two Key Programs have been granted, with Profs YI Chaolu and WANG Shiping acting as PIs. Dr. WANG Xiaoping also won the Excellent Young Scientists Fund for her study on Persistent Organic Pollutants (POSPs) in the Tibetan Plateau. What's more encouraging is that Prof. KANG Shichang won the National Science Fund for Distinguished Young Scholars from NSFC, with a total of 2 million RMB funding.

► ITP Prof. YANG Kun nominated associate editor with Journal of Hydrology

Invited by Prof. K. P. Georgakakos, editor of the Journal of Hydrology, ITP Prof. YANG Kun will act as associate editor of the internationally acknowledged journal. Yang will be responsible for editing manuscripts related to hydrology and hydrometeorology.

Launched in 1963, the Journal of Hydrology is highly influential in the international hydrological community. Prof. Yang has long been engaged in land surface modeling and data assimilation. He is also an expert in land-air interaction study. The nomination of Yang into the journal is recognition for his academic achievement in relevant research fields.

RESEARCH HIGHLIGHT

► Nature news reports on YAO Tandong's study of Third Pole glaciers

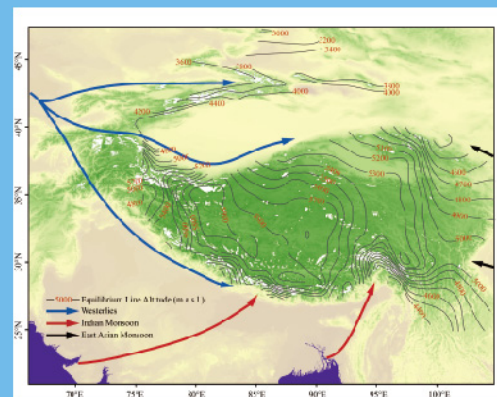
"Tibetan glaciers shrinking rapidly" was published online in Nature on July 15, 2012 (<http://www.nature.com/news/tibetan-glaciers-shrinking-rapidly-1.11010#/ref-link-1>). The news item, composed by Jane Qiu, highlights the integrated research by ITP Prof. YAO Tandong and his colleagues on glacial mass balance on the Tibetan Plateau and surroundings, in which a paper was recently published by Nature Climate Change.

The paper by Yao et al in Nature Climate Change is regarded as the first comprehensive report on glacial mass balance monitoring in the Third Pole region integrating ITP in situ measurements with previous studies and remote sensing data in the region. The study aims to settle current disputes about the status of glaciers on the Third Pole.

► How are glaciers melting in the Third Pole region? Yao et al attempt clarification:

As the "water tower of Asia," glaciers on the Tibetan Plateau and surrounding regions hold the largest ice mass outside the Arctic and Antarctic regions, and are closely tethered to the livelihood of the region under global climate change. The release of the latest IPCC report identifies glacier status in the Himalayas as a hot topic. Glacier variation in the region has become a research focus with scientists taking various approaches to their studies, making controversies even foggier.

In an effort to provide a comprehensive, big picture of glacial melt in the region, YAO Tandong and his team integrated in situ measurements from 13 glaciers with other glacier inventory data, topographic maps and satellite images from LANDSAT-MSS/TM/ETM+, ASTER and LISS.



Map of the glacial equilibrium contour lines and prevailing atmospheric pattern over the Tibetan Plateau

The study found that there exist "systematic differences in glacier status from region to region, with the most intensive shrinkage in the Himalayas (excluding the Karakorum) characterized by the greatest reduction in glacial length and area and the most negative mass balance. The shrinkage generally decreases from the Himalayas to the continental interior and is the least in the eastern Pamir, characterized by the least glacial retreat, area reduction and positive mass balance."

Possible causes for the systematic differences as proposed through in-depth climate survey throughout the region, can be attributed to the dominating atmospheric circulation systems, the westerlies and the summer monsoon. Under global warming, the intensifying westerlies contribute to increased precipitation in the Pamir region, significantly counteracting the glacial loss with warming, while the weakening summer monsoon brings decreased precipitation to the Himalayas, enhancing the glacial loss.

The assessment by YAO et al covering glacial melt over the past 30 years has been published in Nature Climate Change, 2012, Vol. 2, Page 663-667.



Pictures and case study showing obvious glacial retreat on the Tibetan Plateau

► ITP scientists' research cited in NAS report on glaciers

The US National Academy of Sciences (NAS) recently published a report entitled "Himalayan Glaciers: Climate Change, Water Resources, and Water Security". In the report, ITP researchers' studies on Tibetan Plateau climate changes, in the past 2000 years and at present, have been frequently cited. Among those referred studies are academic achievement made by YAO Tandong, XU Baiqing, LIANG Eryuan, QIN Jun and their research teams.

SCIENTIFIC ACTIVITIES

► Chinese scientists investigate hydrological status in river origins

A 10-day preliminary expedition consisting of ITP Profs. YAO Tandong, YANG Yongping, ZHANG Yinsheng, SU Fengge and TIAN Lide, and a dozen more crew, to the Ngari Region kicked off on July 1, 2012.

The group trekked to the source regions of the three major rivers in South Asia, which includes Peacock River catchment (head of the Ganges River), Jiemayangzong Glacier and Angsedongdong Glacier (heads of the Yarlung Zangbo), and Sengge Zangbo and Langqên Zangbo (heads of the Indus River).



Group photo of expedition crew at Jiemayangzong, the origin of the Parlung Zangbo



Automatic Weather Stations (AWS) were set up in the river source region, and hydrologic profiles were established for the upper streams. Glacier mass balance measurements were also initiated with in situ meteorological observations recorded on the glacier surface.



AWS configuration and testing in the field

A preliminary survey of vegetation and bio-diversity was also conducted along the rivers' origins. The data acquired is believed to be useful in further investigation and monitoring of vegetation succession in areas experiencing glacial retreat.

Surface water was also taken for sampling along the way as needed for further study of stable isotopes in the western part of the Tibetan Plateau.

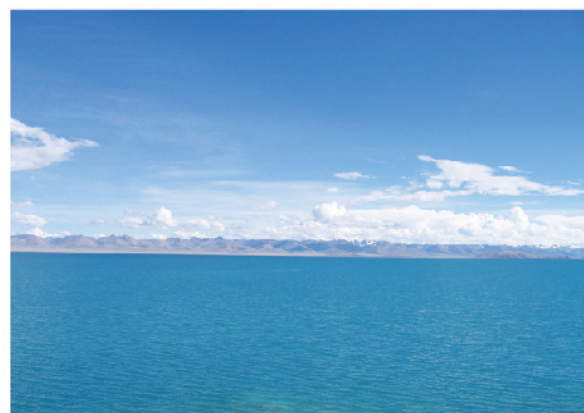
► Air quality in Namco, Tibet, China, comparable to that of Antarctica

The report, which is entitled “Air quality in Namco, Tibet, China, comparable to that of Antarctica”, cited a study by ITP researchers (Cong et al. Atmospheric Research, 2009 and Xia et al. Atmospheric Environment, 2011). CONG Zhiyuan, associate professor at ITP, told the reporter that the particulate matter (aerosol) content in the atmosphere in Namco is very low and long-term monitoring data from the sun photometer shows that the annual average of the atmospheric aerosol optical depth (AOD) in Namco is 0.029, which makes it one of the cleanest areas in the world in terms of atmosphere, comparable to Antarctica.

ITP researchers at the Namco station also keep continuous

monitoring of the mass concentration of airborne fine particulate matter (PM_{2.5}), another important indicator of air quality. It is observed that the PM_{2.5} average concentration in 24 hours is around 10 micrograms /m³. This figure is much lower than the standard set by China Ambient Air Quality Standard for Nature Reserves, which requires the PM_{2.5} 24-hour average concentration should not exceed 35 micrograms /m³.

According to Kang Shichang, professor of ITP and director of the Namco station, vegetation cover in the Namco area is well preserved and there are no significant industrial and agricultural activities. Local residents do not use lots of fossil fuels and modern transportation means are also limited. All these factors contribute to the high quality of air in Namco. The clean atmospheric environment in the region can represent the background status of the Northern Hemisphere under natural conditions, according to Kang.



► ITP scientist questions aerosol as the major cause for solar dimming over Tibetan Plateau

Solar radiation over the Tibetan Plateau has declined over recent three decades, whereas total cloud cover has a decreasing trend. A likely explanation to this paradox is the increase in aerosols over this clean region. However, ITP Prof. YANG Kun and his group have conducted a study that seemed to question this hypothesis.

According to Yang's study, the radiation extinction

due to aerosol loading is of one order lower in magnitude than the observed dimming, and the solar dimming is also seen in a satellite product that was produced without considering temporal variations of aerosols. Instead, the inter-annual variability and decadal change in solar radiation is contrasting to that in water vapor amount and deep cloud cover (but not total cloud cover).

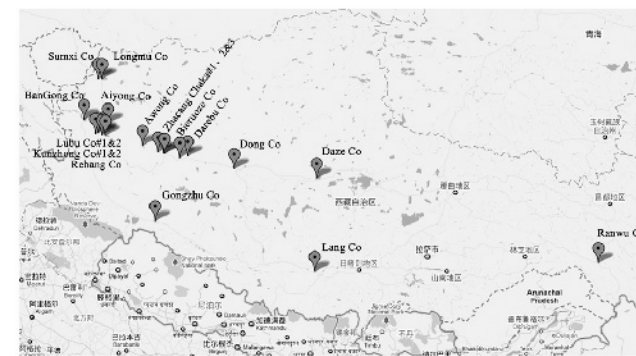
Based on related quantitative research and modeling, the group suggests that the solar dimming over the Plateau is mainly due to the increase in water vapor amount and deep cloud cover, which in turn are related to the rapid warming and the increase in convective available potential energy.

The research led by Prof. Yang has undergone peer-review and was accepted by Geophysical Research Letters to its October issue (Vol.39, No. 20, doi:10.1029/2012GL053733).

► Biogeographical patterns identified across the Tibetan Plateau

“Both geographic distance and chemical factors govern bacterial biogeography in lake sediments.” According to ITP Prof. YAO Tandong and his colleagues based on barcode pyrosequencing of sediment samples from 15 lakes on the Tibetan Plateau (41670 km apart). They quantified the effects of local geochemical properties and geographic distance for bacterial community structure and membership, and confirmed that pH was the best predictor of bacterial community structure in alkaline sediments.

Continent-scale biogeography has been extensively studied in soils and marine systems, but little is known about biogeographical patterns in non-marine sediments.

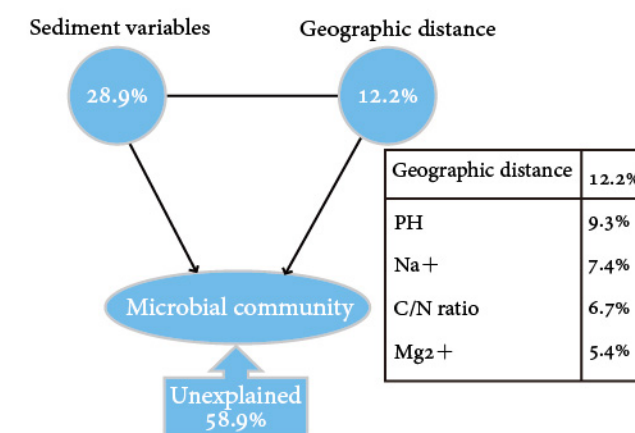


This study by ITP scientists and their collaborators entitled “Geographic distance and pH drive bacterial distribution in alkaline lake sediments across Tibetan Plateau” has been published in the September issue of the Environmental Microbiology.

Apart from the “surprisingly diverse and distinct” bacterial communities in lakes from soil communities, they also identified that, four dominant phyla (i.e., Proteobacteria, Bacteroidetes, Firmicutes and Actinobacteria) out of 26, though 20.2% of sequences were unclassified at the phylum level.

According to their study, more geographically distant sites had more dissimilar communities ($r=0.443$, $P=0.030$). Variance partitioning analysis showed that geographic distance (historical contingencies) contributed more to bacterial community variation (12.2%) than any other factor, although the environmental factors explained more variance when combined (28.9%).

(Environmental Microbiology, 14, 9, 2012)



► Science article summarizes Himalayan glacier changes

TPE scientist Tobias Bolch and co-authors recently published an article in the journal Science entitled, “The state and fate of Himalayan glaciers”. The article discusses glacial mass loss and gain in the Himalayas, stretching from the southeastern glaciers in Bhutan to the northwestern glaciers in the Karakoram.

The following excerpt summarizes the main idea of the article: “Here, we review the state of knowledge about key characteristics, current extent, and changes of H-K



glaciers since the mid-19th century. We also discuss projections of possible future changes, summarize important implications for water resources and natural hazards, and close by sketching a framework for integrated cryosphere research needed to fill the most critical gaps.” (Science, 336, 310, 2012) Online at: www.sciencemag.org

► Environmental Development journal publishes TPE article

The scholarly journal Environmental Development recently

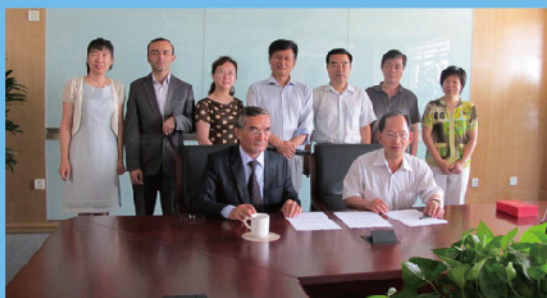
published an article titled, “Third Pole Environment (TPE)”. The article was authored by the three TPE Co-Chairs, Tandong Yao, Lonnie G. Thompson, Volker Mosbrugger, and 12 others. The article stresses the importance of the Third Pole region, stating “The unique interactions among the atmosphere, cryosphere, hydrosphere and biosphere on the Third Pole ensure permanent flows of Asia’s major rivers, thus significantly influence social and economic development of China, India, Nepal, Tajikistan, Pakistan, Afghanistan and Bhutan where a fifth of the world’s population live.” (Environmental Development, 3, 52-64, 2012) Online at: www.elsevier.com/locate/envdev

INTERNATIONAL COOPERATION

► ITP establishes cooperation with Institute of Geology Tajikistan Academy of Sciences

Invited by ITP Prof. DING Lin, Prof. Yunus Mamadjonov, Director of the Institute of Geology Tajikistan Academy of Sciences (IGTAS), visited ITP on July 11, 2012. He conducted in-depth academic exchanges and communications with the ITP scientists in the fields of geology and geotectonics.

Prof. YAO Tandong welcomed the guest by introducing to him ITP research realms and international cooperation. Identifying common interest in academic understanding of the Pamir Plateau region, ITP and IGTAS signed a memorandum of understanding for further cooperation in Third Pole environment study.



The signing ceremony of the Memorandum of understanding between ITP and IGTAS

► ITP professors join CAS President on a visit to Pakistan

A group of CAS delegates led by CAS President BAI Chunli visited Pakistan from July 15 to 17, 2012, conducting academic exchanges and communications with scientific staff at Pakistan Academy of Sciences (PAS), National University of Science & Technology, Pakistan, and Atta-ur-Rahman School of Applied Biosciences.

ITP Profs. YAO Tandong and ZHANG Yinsheng were among the visiting group. Both professors were also invited to deliver speeches during the PAS-CAS bi-national conference, where Prof. Yao introduced “Sino-Pakistan cooperation study under the framework of TPE program” and Prof. Zhang reported on “Observational Research of Land surface hydrology in upper Indus river basin, North Pakistan”.

At the bilateral conference, thorough discussion concerning opportunities for cooperative study in the fields of nano-science and nano-technology, internet security, ecology and environmental sciences was conducted.

In addition to the group visit, ITP Prof. Yao also met with Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) Chairman Mr Ahmed Bilal. Both sides approved of the joint research achievements made between ITP and SUPARCO under the framework of the TPE program, and agreed to further promote the cooperation.



► National Science Foundation delegate visits ITP

Dr. Enriqueta Barrera, Director of Geobiology and Low-Temperature Geochemistry Program Division of Earth Sciences, National Science Foundation (NSF), visited ITP on September 3, 2012.

Her visit was warmly welcomed by ITP deputy director YANG Yongping, who hosted a meeting to acquaint Dr. Barrera with the research programs and major international cooperation programs at ITP. During the meeting, Prof. ZHANG Fan introduced the TPE program, the ongoing international cooperation program promoted by ITPCAS.

Dr. Barrera was interested in the field observation network in the Third Pole region, as well as the young scientists training project within the TPE program. She also briefed ITP scientists on the NSF program entitled “Critical Zone Observatory Program”, which aims to address pressing interdisciplinary scientific questions concerning geological, physical, chemical and biological processes and critical zone system dynamics.

Participants then discussed deepened, academic issues with Dr. Barrera. Both sides expressed hopes for further cooperation.

► ITP co-sponsors the 3rd SCO National Academy of Sciences young scientists training program

The 3rd Shanghai Cooperation Organization (SCO)

National Academy of Sciences summer school for young scientists was held during July 16-August 3, 2012, sponsored by CAS Bureau of International Cooperation and co-sponsored by ITP. Over 22 young scientists from the five member countries within SCO attended this young scientists training program, in addition to some young scholars from Nepal and Myanmar.

During the 21-day training program, participants were introduced to the pre-treatment technique for rocks, soil, and biological samples. They were also taught the analysis skills of rare earth and trace elements, dating methods with Ar-Ar and U-Pb, and measurement of stable and radioactive isotopes. ITP geophysicists also delivered courses to acquaint them with the principles in sites selection for GPS and broad-band seismographic equipment allocations, and relevant data processing skills. Experienced scientists in the aforementioned subjects from ITP and China Geological University were invited to host the training courses.

In addition to classroom seminars and hand-on lab experience, participating young scientists also went on a 3-day field expedition to Qin Huang Dao, Hebei Province. The training program concluded on August 3, with all participants in the program receiving a graduation certificate.



TEL laboratory technician introducing the measuring techniques to participants of the training program



Field expedition to Qin Huang Dao



► NCAR scientist Aiguo Dai visits ITP

Invited by ITP Prof. YANG Kun, Dr. Aiguo Dai, researcher at the National Center of Atmospheric Research (NCAR), visited ITP on July 20, 2012. He attended Prof. Yang's research group gathering, and offered some suggestions on further academic research to graduates after listening to their academic presentations.

On the afternoon of July 20, Dr. Dai presented a talk titled "Increasing drought under global warming" to interested research staff at TEL. In his talk, he presented observational evidence of increasing drought since 1950 over the continents, and demonstrated that the observed changes so far were consistent with model predictions on a global scale. He also noted the regional discrepancies that exist due to natural decadal variations that are irreproducible by the models.

Dr. Dai is experienced with hydrological circulation studies on both regional and global scales. He currently serves as editor for the Journal of Climate and associate editor for the Journal of Hydrology.

► UCLA Prof. An Yin conducted academic exchanges with ITP geologists

An Yin, professor at University of California Los Angeles and internationally acknowledged Tibetan Plateau researcher, visited ITP on August 10, 2012, to conduct academic exchanges with ITP geologists.

During the research seminar, Prof. Yin presented his



Prof. An Yin during the presentation

latest research entitled "Evidence and possible cause of the Yarlung River reversal during the late Cenozoic development of the Himalayan Orogen". He elaborated on the study of the evolution of the Yarlung Zangbo river system, focusing on the river system formation and related tectonics.

► ITP welcomes Bangladesh visitors

A 6-member delegation from the Bangladesh Ministry of Chittagong Hill Tracts Affairs visited ITP



on September 28, 2012. The delegation was headed by Secretary-General Mr. NabaBirkram Kishore Tripura, and warmly welcomed by ITP deputy director Prof. MA Yaoming.

Academic exchanges with the visiting delegates included introduction of ITP's research scope and academic realms, graduate education and outreach to foreign students. The delegates were also acquainted with the TPE program, including its young scientist education and training projects and international joint expeditions. ITP's ongoing research programs related to the South Asian region were also reported, including the tectonic significance of the Chittagong Hill to the Eurasian formation and Indian plates collision, the application of the hydrological modeling in the Tibetan Plateau, and the study of the interactions between Tibetan Plateau climate and the Plateau uplift.

The Bangladesh visitors were greatly interested in the TPE program and the ITP research activities. They hope to involve Bangladesh young scientists in the training projects, and agreed to further pursue academic collaboration between both nations, in part through joint expeditions and other academic exchanges.

TIBETAN PLATEAU OBSERVATION AND RESEARCH PLATFORM (TORP) ACTIVITIES

► Peking University students visit SETORS

Under the agreement between ITPCAS and the School of Physics, Peking University, SETORS welcomed ten students from the Department of Atmospheric and Oceanic Sciences, School of Physics, Peking University, on June 23-25, 2012.

Visiting students were acquainted with the station and its surrounding areas to experience the natural environment and the present living status of Tibetans, as well as Tibetan customs and food. Dr. WANG Yongjie introduced the station equipment and observation methods.

► CAS Academician SUN Honglie visits stations on the Tibetan Plateau

27-31 July, 2012, CAS academician SUN Honglie, accompanied by ITP director YAO Tandong and IGSNRR director LIU Yi, visited ITP Lhasa Campus, SETORS, NAMORS and the Nagqu Ecological Observation Station.

During the visit, Prof. Yao briefed SUN on the latest progress achieved in field station construction by ITP. Academician SUN praised ITP's achievements in constructing and maintaining observation stations and encouraged ITP scientists to further focus on research projects that will address the challenges facing Tibet. SUN pointed out that our research should serve local economic development in Tibet, to secure ecological safety and at the same time increase Tibetan farmers' income.

► SETORS welcomes NUIST President

Prof. LI Lianshui, President of Nanjing University of Information Science and Technology (NUIST) visited the SETORS in late July, 2012. His visit was accompanied

by Mr. WANG Pengxiang, deputy director of the Tibet Meteorological Bureau, TAR.

They were welcomed by SETORS deputy head Dr. WANG Yongjie. Dr. Wang showed them around the stations, and introduced them to the station history and current activities related to the comprehensive study of the alpine environment.

Prof. Li showed great interest in field observations at the station, and is willing to push for further cooperation between ITP and NUIST. Mr. Wang also pledged further help in promoting cooperative research with ITP for studying the Tibetan Plateau environment and climate.

► Center for Tibetan Plateau Environment established

Center for Tibetan Plateau Environment, a new research unit in Tibet, was jointly established by ITP, Tibet University and the University of Chinese Academy of Sciences. The signing ceremony was held on August 16, and was attended by CAS President BAI Chunli, Vice Chairman of TAR MENG Deli and directors of the three research institutes involved.

The newly established center will focus its research on studying climate change and addressing geo-hazards in Tibet. The center will also help serve local economic development and is a good example of academic-outreach and cooperation.

