

# PolyU innovations sweep awards in Geneva

**P**olyU innovations have scooped nine awards in the 36th International Exhibition of Inventions, New Techniques and Products held from 2 to 6 April in Geneva. On top of the International Press Prize, PolyU researchers won one Grand Award, three Gold and two Silver Medals as well as two Special Prizes.

Under the patronage of the Swiss Federal Government and the City Government of Geneva, the annual exhibition has put together some 1,000 inventions by more than 700 exhibitors from 45 countries and territories, drawing more than 72,000 visitors from all over the world.

The five winning projects are listed as follows:



*Dr Lui Sun-wing, Vice President (Partnership Development) (centre), and key researchers of the award-winning projects show off their prizes and medals.*

## International Press Prize, Gold Medal and Special Prize: A High-power LED Street Lighting System with a Modular Lamp Holder

Led by Prof. Lee Wing-bun, Chair Professor and Head, Dr Sandy To, Assistant Professor, *Department of Industrial and Systems Engineering*

This energy-saving street lighting system only consumes one-tenth of energy as compared to traditional lighting system. The saving of energy is achieved by the effective use of high-power Light-Emitting Diode (LED) on a modular lamp holder, together with the use of ingeniously designed freeform optical surfaces. While the modular lamp holder ensures better dissipation of heat, the optical surfaces with non-rotational symmetry results in uniform distribution of light and hence increases energy efficiency. It can also be used for outdoor advertising, decorative lighting and indoor illumination.

This invention also grasped the International Press Prize—one of the top ten awards of the exhibition—which honours the invention that received the highest number of votes by journalists visiting the event. It was the first time that the University was bestowed with this coveted honour.





**Grand Award and Gold Medal:  
Chinese Chess for Visually Impaired People**

Led by Dr Michael Siu, Associate Professor, *School of Design*

The invention is the first set of Chinese chess with an inclusive and universal concept which allows people with different vision capabilities, including the visually impaired and the blind, to enjoy playing chess together.

The chess set, specially developed by PolyU designers in collaboration with the Hong Kong Blind Union, can help the visually impaired distinguish different chess pieces, including the different colours of pieces; search, read, locate, move and pick up pieces; read pieces from different directions without any confusion; realize the whole setting of the chess game; and learn and become familiar with the game easily. More importantly, the newly invented international tactile information overcomes the perplexing variations of existing Braille systems based on the pronunciation of dialects.



**Silver Medal:  
Harmful Algae Indexing (HaiDex) System**

Led by Prof. John Liu, Chair Professor and Head, Dr Yan Jia, Assistant Professor, *Department of Logistics (LGT)*; Prof. Samuel Lo, *Department of Applied Biology and Chemical Technology (ABCT)*

The frequent occurrence of Harmful Algal Bloom (HAB), which is commonly known as red tide, has caused tremendous damage to fisheries worldwide. Although the formation process of HAB has yet to be discovered, it is feasible to forewarn and predict the occurrence of large-scale HAB based on a viable and efficient indexing system. The newly invented HaiDex System is a diffusion-characterized water pollution indexing technology. Using dynamic diffusion characteristics, the HaiDex technology is invented to characterize statistically the formation process, and to develop computationally monitoring measures of water quality, and therewith to assess dynamically the likelihood of occurrence of harmful algal bloom.

The development of this system has brought together inter-disciplinary expertise from LGT (Dr Yan Jia and Dr T.L. Yip) and ABCT (Prof. Samuel Lo). Professor Ho Kin-chung of the Open University of Hong Kong has integrated the water quality parameters with theories of phytoplankton dynamics and formation mechanisms of HAB.



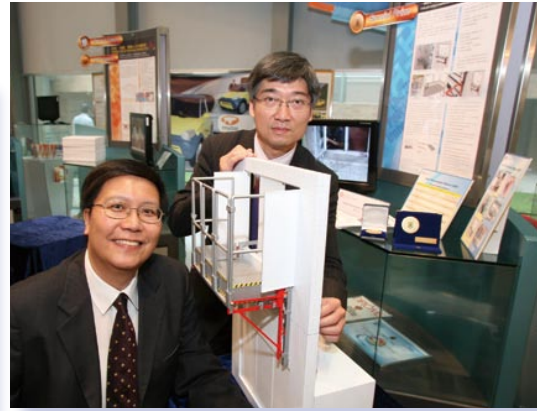


### Gold Medal with Jury's Congratulations and Special Prize: Rapid Demountable Platform

Led by Prof. Albert Chan, Associate Head, and Prof. Francis Wong, Head, *Department of Building and Real Estate*

Jointly developed by PolyU and the Construction Industry Institute Hong Kong, the Rapid Demountable Platform (RDP) provides an alternative system which is safer than the traditional bamboo truss-out scaffold when carrying out repair and maintenance works on high-rise buildings.

Unlike bamboo truss-out scaffold which relies on proper installation of a few anchor bolts fixed to the external walls, the RDP is a robust and solidly built device with steel frames, aluminium alloy panels and stainless steel railings. This modular-based platform, which can be easily installed and dismantled, can flexibly suit workers' needs in carrying out various minor maintenance works such as external wall inspection, changing air-conditioning unit, maintenance of plumbing/drainage system and painting.



### Silver Medal:

#### Modern Chinese Medicine Product Development: A De-bulking Approach

Led by Prof. Qian Zhong-ming, *ABCT*; and Mr Alexander Tzang, Deputy President

This novel methodology preserves the quality of original bulk formulation for effective modern day administration. The efficacy of traditional Chinese medicine (TCM) formulation based on natural herbs has long been scientifically established, but the complexity of the original collection of ingredients in pharmacological effects and their physical bulkiness make them difficult to be developed into modern dosage forms. Using a novel de-bulking approach, PolyU researchers can now remove non-contributory portions of the original formulations, thereby 'reducing' the extracts into convenient modern dosage forms while preserving active function of the original TCM formulae with its holistic nurturing intent.

This proprietary methodology is being used by PolyU Modern TCM Research Institute Ltd (PTCMR) in developing modern TCM products. For instance, CardioFlex and Deerhorn Lingzhi are natural products carefully engineered by a de-bulking process to come up with a much concentrated form for holistic health care under established TCM practices. The respective products are able to achieve balanced caring for cardiac and immunological functions that most other single ingredient products do not exhibit, yet with a concentrated user-friendly dosage.



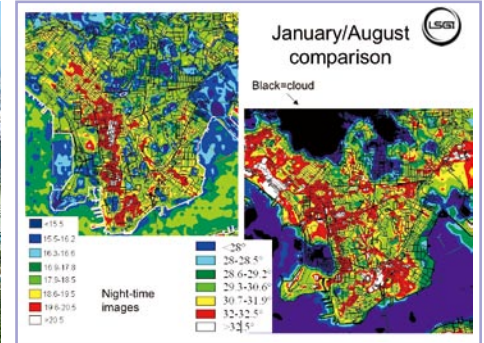
# Impact of Urban Heat Island effects examined

At the Workshop on Earth Observation in Urban Planning and Management recently organized by the Department of Land Surveying and Geo-Informatics (LSGI), the impact of Urban Heat Island (UHI) effects on Hong Kong and other cities was explored by leading experts in remote sensing, geographic information system and urban climatology.

UHI effect means an urban area is significantly warmer than its rural surroundings, and the temperature difference is usually larger at night and in winter. There are several causes leading to UHI, according to Prof. Professor Tim Oke of the University of British Columbia in Canada, who first put forward a theory to explain the formation of UHI in 1982.

These include high-rise buildings which block thermal radiation in the night, materials with thermal bulk properties such as asphalt and concrete, and the lack of vegetation in urban areas.

With its densely populated urban area, Hong Kong provides a typical example. In studying the territory's UHI intensity last winter, Dr Janet Nichol, Associate Professor of LSGI, and her research team have reviewed satellite



images and collected ground data by making some 20 trips on special mobile vehicles at dusk and dawn. Each vehicle was equipped with two temperature sensors and a GPS receiver.

After analyzing the data, PolyU researchers found that there was an average temperature difference of 7°C to 8°C between urban and rural areas in a winter night, and the maximum difference could be as high as 12°C. On a summer night the difference between urban and rural areas was 5°C to 6°C. Although in most cases the land was cooler than the sea at night, Kowloon and the northern part of the Hong Kong Island were much warmer. In summer the land is significantly warmer

than the sea, offering the potential for cooling sea breezes. In both summer and winter the hottest urban area is Mong Kok, closely followed by Causeway Bay. The coolest area is the rural area around Ta Kwu Ling.

Dr Nichol said the large urban centre of Kowloon, with a population of over two million, is dominated by a strongly developed, regional scale urban boundary layer, and its urban canopy layer climate is reinforced by heating from both above and below. Reduced ventilation, high temperatures and the blocking of sea breezes by tall buildings on the newly reclaimed land, or the so called "wall effect" are contentious issues.

The UHI effect has the potential to directly influence the health and well-being of city dwellers. It is particularly damaging during a heat wave, as it deprives urban residents of the cool relief found in rural areas during the night. As a result, the relationship between UHI and public health has become a hot research topic in the US. Experts in the field are working on a project to use remote sensing data for estimating airborne particulate matter over the Atlanta, Georgia Metropolitan Area. It aims to examine the feasibility of building an integrated electronic health and environmental data network in five counties of Metropolitan Atlanta.





# Tourism demand forecasting system launched

The University's Public Policy Research Institute and School of Hotel and Tourism Management (SHTM) have jointly developed a web-based Hong Kong Tourism Demand Forecasting System which can help tourism practitioners obtain first-hand information on the future trend of tourism for business development and policy making.

The sophisticated system, maintained by an expert panel led by Prof. Haiyan Song, Associate Director of SHTM, forecasts tourism-related demands in terms of tourist arrival, expenditure by sectors and hotel room nights. The forecast figures are available for 10 major source countries and regions, including Australia, Japan, Korea, Macao, the Chinese mainland, the Philippines, Singapore, Taiwan, the UK and the US.

Apart from incoming tourists, the system also predicts the number of outgoing Hong Kong residents and their preference of tourist destinations in the next decade, providing useful figures for industry practitioners to project future demand. The demand forecast



for hotel room nights is available by types of tariff, and all the forecasts will be updated on a quarterly basis.

Take the Chinese mainland as an example, according to the system, the number of mainland tourists arriving in Hong Kong is

expected to increase more than twofold from 3.27 million in the first quarter of 2008 to 8.59 million in the fourth quarter of 2015. An increasing demand for Medium Tariff Hotels and Guest Houses by mainland tourists in the years ahead is also anticipated. In addition,

the system is capable of predicting their expenditures and demands for restaurants, transportation and retail products.

The information is restricted to subscribers only. Potential subscribers are entitled to a three-month free trial during which they can have access to the forecasts on quarterly tourist arrivals to Hong Kong. Full subscribers will be able to access all information available in the system, including four quarterly reports. Further details on the Forecasting System can be obtained from its official website at URL: <http://www.TourismForecasting.net>.

