

RESEARCH &  
DEVELOPMENT

研究與發展

FROM  
BRIGHT IDEAS  
TO SOCIAL  
GOOD

創新思維 造福社會

Our researchers and innovators ensure that making new discoveries is not the end but the start to a better world.

我們的研究人員和發明家不會安於只尋求突破，他們的目標是要讓創新發明造福世界。

RESEARCH  
FUNDING

科研經費



In addition to receiving funds allocated by the University, academics at PolyU applied for funding from external sources, either through competitive or non-competitive means, for their research projects. Total funding in 2015/16 amounted to HK\$2,540 million in support of 3,600 projects undertaken by more than 840 academic staff and around 1,450 research personnel.

除了大學提供的科研經費，學術人員同時積極透過競爭或非競爭渠道，申請校外不同類型的科研基金，以資助他們的科研項目。2015/16年度，理大科研計劃的總資金為二十五億四千萬元，資助三千六百項計劃，而參與其中的學術人員有八百四十名，科研人員約一千四百五十名。



## Newly-funded research projects in 2015/16 2015/16 年度新科研項目

Funding source 資金來源	No. of projects 計劃數目	Amount (HK\$m) 資助額 (百萬港元計)
Research Grants Council 研究資助局	176	117.79
Innovation and Technology Fund 創新及科技基金	54	120.10
Other competitive grants 其他透過競爭渠道獲取的科研經費	57	40.91
China Fund# 中國境內科研基金	47	44.09
Non-competitive grants* 非競爭性資助	580	354.65
<b>Total 總數</b>	<b>914</b>	<b>677.54</b>

# The amount is calculated at an exchange rate of RMB1: HKD1.11788  
根據 1 人民幣 : 1.11788 港元的匯率計算

\* Including industrial/commercial support and donations  
包括工商機構贊助及捐贈

# RESEARCH PROJECTS 研究項目

## Aviation and space 航空航天

### 1 Rapid manufacture of titanium aircraft components

Titanium aircraft parts often require weeks to manufacture using conventional methods, due to their curvature. In this project, a team at the Aviation Services Research Centre led by Dr Stephen O'Brien scanned the area of the fuselage to automatically produce a CAD model, which was then used in the rapid manufacturing process. In the additive manufacturing process, a titanium model was produced in just a few hours.

### 快速製造鈦金屬飛機零件

由於零件的曲率，用傳統方法生產鈦金屬飛機零件往往需時數週。在這項目中，航空服務研究中心區柏賢博士與其小組研究透過掃描機身面積，自動產生電腦輔助設計模型，隨即在快速製造過程中使用。在往後的添加製造過程中，僅需數小時便完成鈦模型的製造。

### 2 Acoustic design and integrity monitoring of space structures

At the Joint Laboratory in Mechanics and Space Environment Engineering established with the China Academy of Space Technology, the research team of Prof. Cheng Li at the Department of Mechanical Engineering has been working on two projects. The first project is for developing simulation tools and noise and vibration control techniques used in aerospace applications. This research will also be used to design a comfortable environment for astronauts and to control noise and vibration sources for the normal operation of onboard devices. The second project is for developing techniques to monitor structural damage of satellite structures during both the pre-launch and in-orbit stage.

### 空間結構的聲學設計及完整性檢測

在與中國空間技術研究院共同建立的力學與空間環境工程技術聯合實驗室中，機械工程學系成利教授的科研團隊正進行兩項計劃。第一項計劃是為航天用途而研發的模擬工具、控制噪音及震動的技術。這些技術將用於為太空人設計舒適的環境，以及透過控制噪音和震動源頭，確保在軌儀器正常運行。另一項計劃是研發技術檢測衛星，在發射前及在軌期間結構的損毀情況。

- 1 Laser melting system  
鐳射熔化系統
- 2 Satellite structure for laboratory testing  
用於實驗室測試的衛星模型



## Healthcare and food safety 醫療保健與食物安全

### Advances towards wearable or implantable electronics

In collaboration with City University of Hong Kong and Hong Kong Baptist University, Dr Yan Feng of the Department of Applied Physics is developing novel organic semiconductors and special printing techniques for the preparation of high-performance organic transistors on flexible or textile-based substrates. These devices can be used as wearable electronics that read bio-information on skin or implantable electronics in the body to extract bio-information. In addition to their biological and clinical applications, the new technologies can be used in the development of healthcare products.

### 可穿戴或可植入電子設備的新發展

應用物理學系嚴鋒博士與香港城市大學及香港浸會大學，共同研究新型有機半導體和獨特的列印技術，將能應用於製造基於柔性襯體／織物襯體的高性能有機晶體管。這些電子器件可應用於「可穿戴電子設備」，在體表讀出生物資訊；又能用作「可植入電子設備」，植入人體內讀取生物資訊。這些科技不但能應用於生物學及臨床用途，更可用以開發醫療保健產品。

### “Scar-care” padding

To provide better treatment of hypertrophic scars after burn injuries or major skin trauma, Prof. Cecilia Tsang Wai Ping at the Department of Rehabilitation Sciences has developed a medical-grade silicone gel with a special coating (“Scar-care”) to reinforce pressure and hydration. The “Scar-care” padding is coated onto a silicone rubber sheet with circular studs, which can be adjusted according to different body contours so that pressure can be evenly distributed on the scar surface. Clinical trials have shown positive results in terms of scar pigmentation, thickness and pliability.

### 疤痕墊

為改善治療燒傷或皮膚創傷所引致的增生性疤痕，康復治療科學系曾慧平教授研發出一種醫療級別「疤痕墊」，以提升加壓及保濕功效。「疤痕墊」覆蓋在一塊矽膠面上，膠面設計成圓形的小截，可配合人體不同部位的輪廓，緊貼疤痕的表面，使壓力均勻分佈。臨床測試結果顯示「疤痕墊」有效改善疤痕的色素、厚度及柔軟度。

### 3 Establishing Chinese materia medica standards in Hong Kong

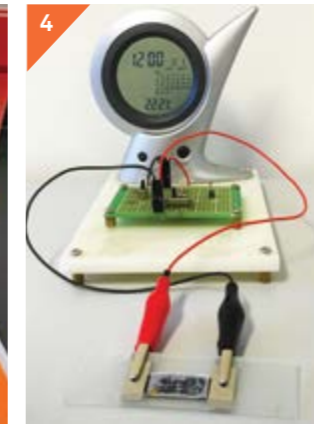
A team led by Dr Daniel Mok Kam-wah, Deputy Director of the State Key Laboratory of Chinese Medicine and Molecular Pharmacology under the Department of Applied Biology and Chemical Technology, has been working on a Department of Health project — the Hong Kong Chinese Materia Medica Standard — to establish a practical standard for the testing, safety and quality control of Chinese medicines in Hong Kong. The team has completed 36 monographs, which are available online for the industry and public reference.

### 建立香港中藥材標準

應用生物及化學科技學系轄下中藥藥學及分子藥理學研究重點實驗室執行總監莫錦華博士的團隊一直參與衛生署的香港中藥材標準計劃，旨在建立一套實用標準以推動香港在中藥檢測、安全性及質量控制方面的發展。團隊已完成三十六種中藥材的專論，並上載互聯網供業界及市民參考。



Hong Kong Chinese Materia Medica Standard monographs  
香港中藥材標準專論



A paper-based MnO<sub>2</sub> energy storage device powers a liquid crystal display clock  
在紙上製備的二氧化錳能量儲存設備驅動液晶顯示鐘



Air monitoring station at Hok Tsui  
設於鶴咀的大氣觀測站

## Enhancing sustainable urban development 促進可持續城市發展

### 4 Printable energy storage devices

The research team of Prof. Lau Shu-ping at the Department of Applied Physics has been exploring the use of two-dimensional materials for energy applications. Among the applications they have developed is a manganese dioxide (MnO<sub>2</sub>) ink for high-performance printable energy storage devices on paper. It can be used in wearable electronics, tracking devices and sensors. A US patent has been filed for this innovation, which won a silver prize and a special merit award at the Seoul International Invention Fair 2015.

### 可列印的能量儲存設備

應用物理學系劉樹平教授的研究團隊一直致力研發二維材料在能源器件上的應用。其中，團隊利用二氧化錳油墨在紙上列印出具有高性能的能源記憶體件，可廣泛應用於可穿戴器件、跟蹤器和感測器。這項研究正在申請美國專利，並且在2015年首爾國際發明博覽會上獲頒銀獎和特別優異獎。

### 5 World-leading atmospheric research

PolyU set up a background air monitoring station at Hok Tsui on Hong Kong Island in 1992 to support the National Aeronautics and Space Administration's (NASA) study of air pollution by aircraft in East Asia. Prof. Wang Tao of the Department of Civil and Environmental Engineering is responsible for this project, which has collected long-term data on ozone – a key air pollutant and climate-warming gas. The University has participated in many international, national and local air-quality and climate change studies conducted by NASA, the United Nation and HKSAR Environmental Protection Department, establishing PolyU's status in world-class atmospheric research.

### 走在世界尖端的大氣研究

1992年，理大在香港島的鶴咀設立了背景大氣觀測站，支援美國太空總署 (NASA) 針對東亞地區大氣污染開展的飛機航測計劃。這項由土木及環境工程學系王韜教授負責的計劃長期收集大氣臭氧濃度數據，而臭氧是主要的大氣污染物和溫室氣體之一。多年來，大學參與多項國際、國家和本地的空氣質素及氣候變化研究計劃，負責機構包括美國太空總署、聯合國和香港特別行政區環境保護署，令理大的大氣研究晉身世界級水平。

## Producing PHAs from wastewater for energy storage

Biodegradable Polyhydroxyalkanoates (PHAs) are a group of polymers synthesised in bacteria cells that can be used as energy storage materials. Dr Kan Chi-wai of the Institute of Textiles and Clothing found that PHAs can be accumulated in bacteria cells via co-culture methods in wastewater treatment, as the organic matter in wastewater can be used as the carbon source for bacteria to synthesize these polymers. The study also discovered that PHA production is associated with dyeing wastewater. This project will look further into balancing PHA production and wastewater treatment efficiency, as well as adjusting the composition of PHAs through operational controls.

## 以廢水生產聚羥基脂肪酸酯用作儲能

聚羥基脂肪酸酯是一系列由細菌細胞合成的高分子聚合物，可用作能量儲存物質。紡織及製衣學系簡志偉博士發現聚羥基脂肪酸酯能夠在污水處理過程中通過混合培養方法在菌細胞中累積。污水中的有機物可用作細菌的碳源以合成聚羥基脂肪酸酯。研究更發現，聚羥基脂肪酸酯的生產與處理印染廢水有關聯。此項目將繼續探求生產聚羥基脂肪酸酯與污水處理效率之間的平衡，並通過流程控制來調整聚羥基脂肪酸酯的結構。

## 6 Age-friendly city project

PolyU's Institute of Active Ageing participated in the Age-friendly City survey to gauge the age-friendliness of Hong Kong, based on the World Health Organization framework. Headed by Dr Alma Au, the survey underscored the need to attend to the diversity of needs of senior citizens and the importance of finding ways to address these needs and empower people from different social backgrounds. The project adopted a bottom-up community-based approach of intervention for better understanding by the general public.

## 齡活城市計劃

理大活齡學院參與齡活城市計劃，根據世界衛生組織的框架，評估香港的年齡友善程度。在區美蘭博士帶領下，評估結果帶出有必要關注長者的不同需要和為此尋找方案，以及賦予不同背景人士權力的重要性。本計劃採取由下而上、社區為本介入模式，以促進大眾的理解。



Elderly fitness station at Kwun Tong public housing estate  
觀塘公共屋邨的長者健體站

## Exploring migrant labour protection in China

This study conducted by Prof. Pun Ngai of the Department of Applied Social Sciences was designed to synergise macro theories of the traditional social sciences, which look at capital, state and class formation at the abstract level, with the theories of cultural studies that focus on life-world, everyday practices, and new forms of communication. The study also explored new forms of working class youth culture and novel platform of labour rights protection, with the aim of contributing to a new exploration of vocational schools as sites of learning, communication and organizing, and preparing students to be proper working-class subjects.

## 研究保障中國農民工權益

應用社會科學系潘毅教授進行的這項研究，旨在整合在抽象層面思考資本、國家和階級形成的傳統社科宏觀理論，以及關注生活世界、日常實踐和新型傳播學的文化研究理論。本項目探索新興的青年工人文化，打造新型的勞動權益保障平台，以職業學校作為學習、溝通和組織的試點，讓職校學生成為真正的工人階級主體。

## Energy performance assessment and optimisation of campus buildings

By analysing the historical operation data of air-conditioning systems on PolyU campus, significant energy savings can be identified. The Building Energy and Automation Research Laboratory led by Prof. Wang Shengwei has been working on the enhancement of building energy efficiency through assessment, system re-commissioning and tuning and optimal control. Researchers will also build a centralised online platform for real-time energy monitoring, diagnosis, assessment and optimisation of campus air-conditioning systems via the campus network.

## 校園建築能源表現評估及優化

根據過往的空調系統操作數據分析顯示，理大校園現有的系統存有巨大的節能潛力。王盛衛教授領導的建築節能與自動化研究實驗室致力通過評估、系統再校驗及再調試和優化控制，提升樓宇的能源效益。同時，研究人員將研發一個中央在線平台，通過校園網絡實時監測、診斷、評估和優化校園空調系統。

## GNSS positioning infrastructure

Prof. Chen Wu of the Department of Land Surveying and Geo-Informatics has been developing a fundamental Global Navigation Satellite System (GNSS) positioning infrastructure with multiple location-based services to support economic development in Hong Kong. The project will integrate the global positioning system and China's BeiDou satellite navigation system to achieve more reliable real-time kinematic positioning. Researchers will implement GNSS heighting to improve engineering surveying efficiency through the establishment of a high precision geoid model in Hong Kong. They will also provide a reliable platform with Differential Global Navigation Satellite System technologies for mobile operators to support personal and vehicle navigation.

## 全球導航衛星系統定位基礎設施

土地測量及地理資訊學系陳武教授正在開發一個基於衛星導航系統的基礎定位設施，以提供多種位基服務來支持香港經濟發展。這項目整合全球定位系統和北斗衛星導航系統，以實現更可靠的實時動態定位。研究人員將透過在香港建立高精度大地水準面模型，實施全球導航衛星系統高程測量以改善工程測量效率。此外，更會運用差分全球定位系統技術為流動電話供應商提供一個可靠的平台，以支援個人及車輛導航。

## Advancing fibre optic technology 優化光纖技術

### 7 Technology for high-precision fibre-optic sensor network

Prof. Jin Wei at the Department of Electrical Engineering has exploited photothermal phase modulation in a gas-filled hollow-core photonic bandgap fibre to develop a high-precision optical sensor network with ultra-sensitivity, high response speed and multiplexed multi-point detection. Technologies explored in the project included microstructured optical fibres, graphene material, high quality lasers, light detection and signal processing. His work was published in *Nature Communications*.

### 高精度光纖傳感網技術

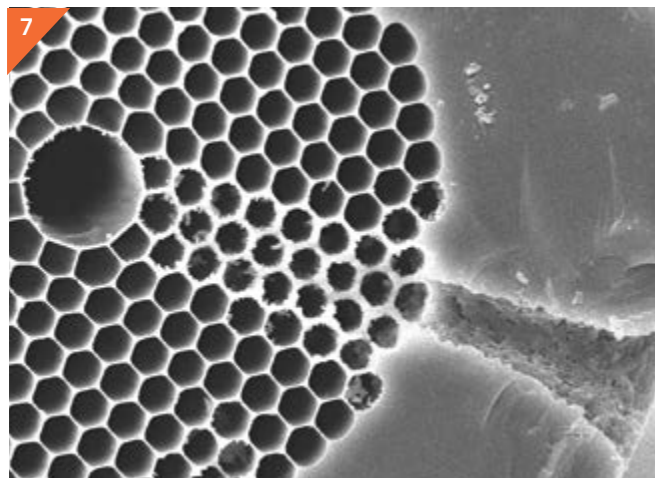
電機工程學系靳偉教授提出空芯光子帶隙光纖中氣體吸收引起的光熱相位調製，實現高精度、超靈敏、高反應速度及組網規模的光纖傳感網。此項目研究微結構光纖、石墨烯材料、高性能激光、光檢測和信號處理等科技。有關研究已於《自然通訊》上發表。

### Next generation of optical networks

Prof. Lu Chao of the Department of Electronic and Information Engineering has been working with Jinan University and Tsinghua University to design optical networks with better system performance. The team has studied modulation format identifications, in-band optical-signal-to-noise ratio monitoring of multi-dimensional multiplexed optical transmission systems, multiple parameters in optical networks and the effective use of optical performance monitoring techniques.

### 新一代光網路

電子及資訊工程學系呂超教授與暨南大學和清華大學合作設計系統性能更強的光網路。團隊研究光信號調製碼型識別、多維複用光傳輸系統中的帶內光信噪比監測、光網路的多個參數，以及有效運用光性能監測技術。



Fabrication of microchannels on hollow-core photonic bandgap fibre using a femtosecond laser to improve the response time of the gas sensor  
利用飛秒鐳射於空芯光子帶隙光纖上鑽孔，加快光纖氣體傳感器的反應速度

# URBAN SUSTAINABILITY 可持續城市發展

PolyU's Research Institute for Sustainable Urban Development (RISUD) currently has a total of 34 research groups in five divisions: Urban Systems, Urban Infrastructure, Urban Environment, Green Buildings and Smart Cities. During the year, RISUD established the Strategic Focus Area Scheme for supporting the emergence and growth of focus areas of strategic importance.

可持續城市發展研究院轄下有三十四個研究小組，分別隸屬城市系統、城市基建、城市環境、綠色建築及智慧城市五個分部。年內，研究院設立「策略重點領域計劃」以資助有策略意義的重點領域，使有關項目得以開拓及發展。

## On-going projects led by RISUD members in 2015/16 2015/16 年度研究院人員帶領進行的項目

### RGC Collaborative Research Fund Projects 研究資助局協作研究金計劃

#### Project title 項目名稱

#### Project leader/Research group 負責人/研究小組

- |   |  |
|---|--|
| 8 A unique multi-function, large-scale physical model testing facility for studying the impact of debris flow on flexible barriers and geo-hazards in Hong Kong<br>大型多功能物理模型試驗設施以研究香港獨有的泥石流對柔性防護欄碰撞和地質災害的影響 | Prof. Yin Jian-hua, Leader of the Urban Geohazards Research Group<br>城市地質災害研究小組組長殷建華教授                                   |
| Development of design methodologies for the improvement of wind and thermal comfort in the urban environment<br>發展新設計方案以改善城市的風和熱環境的舒適度  | Prof. Mak Cheuk-ming, Member of the Building Thermal Environment and Urban Climate Research Group<br>建築與城市熱環境研究小組組員麥卓明教授 |



Flexible barriers installed at a slope site in Hong Kong  
安裝在香港一個斜坡上的防泥石柔性網



This project studies the impact of nitrogen oxides on air quality  
此項目研究氮氧化物對空氣質素的影響

#### RGC Collaborative Research Fund Projects 研究資助局協作研究金計劃

Project title 項目名稱	Project leader/Research group 負責人／研究小組
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9 ▽ Heterogeneous chemistry of atmospheric reactive nitrogen oxides: from capability development to cutting-edge science 大氣氮氧化物的非均相化學研究：從功能開發到前沿科學	Prof. Wang Tao, Leader of the Research Group for Regional Air Quality 區域空氣質素研究小組組長王韜教授
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Thermal desorption aerosol gas chromatograph and time of flight aerosol mass spectrometer for research on airborne particles and their impact on health and the environment 利用熱解析氣溶膠色譜和高分辨飛行時間氣溶膠質譜儀研究大氣顆粒物及其對健康和環境的影響	Dr Guo Hai, Member of the Research Group for Regional Air Quality 區域空氣質素研究小組組員郭海博士
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#### National Basic Research Programme (973) 國家重點基礎研究發展計劃—973 計劃

Project title 項目名稱	Project leader/Research group 負責人／研究小組
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Fracture control and reliability based design of fibre-reinforced polymer (FRP) composites and large-size FRP-reinforced concrete structures 纖維增強複合材料及其增強大型混凝土結構的破裂控制及可靠性設計理論研究	Prof. Teng Jin-guang, Leader of the Research Group for Sustainable Materials and Structures 可持續材料及結構研究小組組長滕錦光教授
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Regional organic pollution in soils of the Yangtze River Delta Region 長江三角洲地區土壤複合有機污染的研究	Prof. Li Xiang-dong, Leader of the Urban Ecosystems Research Group 城市生態系統研究小組組長李向東教授
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#### Innovation and Technology Fund Projects 創新及科技基金計劃

Project title 項目名稱	Project leader/Research group 負責人／研究小組
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Development of a Hong Kong positioning infrastructure based on GPS, BeiDou and ground-based augmentation system 研發基於全球定位系統、北斗與地面增強系統的香港定位基礎設施	Prof. Chen Wu, Leader of the Research Group for Management of Underground Utilities 地下管線管理研究小組組長陳武教授
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Development of a Hong Kong indoor positioning infrastructure based on GPS technologies 研發基於全球定位系統技術的香港室內定位基礎設施	Prof. Ding Xiao-li, Leader of the Research Group for Urban Navigation and Mobility 城市導航及流動性研究小組組長丁曉利教授
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Development of novel high dispersed transparent heat insulation paints for glass 研發用於玻璃的新型高分散透明隔熱塗料	Dr Lu Lin, Member of the Renewable Energy Research Group 可再生能源研究小組組員呂琳博士
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Wastewater-derived energy for smart towns 智慧城鎮的廢水轉化能源	Prof. Li Xiang-dong, Leader of the Urban Ecosystems Research Group 城市生態系統研究小組組長李向東教授
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10 ▽ Location-based technologies for asset tracking and risk management 基於定位技術之資產追蹤及風險管理	Prof. Li Heng, Leader of the Research Group for Construction Virtual Prototyping 建築及虛擬模型研究小組組長李恆教授
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#### National Natural Science Foundation of China - Key Project Programme 國家自然科學基金重點項目

Project title 項目名稱	Project leader/Research group 負責人／研究小組
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Unconsciously collaborative crowd intelligence-based social events geo-information inference and spatial correlation study 研究基於群體無意識協作的社會事件地理信息推斷及空間關聯	Prof. Cao Jiannong, Leader of the Research Group for Urban Big Data Computing and Wireless Networking 城市大數據計算和無線網絡研究小組組長曹建農教授
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Workers wearing helmets with positioning tags  
工人佩戴有定位標籤的安全帽

Positioning anchors are deployed around the construction site  
安裝於工地的定位錨

# AVIATION SERVICES RESEARCH

## 航空服務研究

Celebrating its second anniversary this year, the Aviation Services Research Centre (ASRC) co-founded by PolyU and Boeing announced the achievements of two research projects supported by the Innovation and Technology Fund.

理大與波音公司共建的航空服務研究中心慶祝成立兩周年，更公佈兩個獲創新及科技基金資助的項目之研發成果。



### Mechanical refurbishment of aircraft turbofan blades and ring seals

Using a 5-axis machining centre known as Starrag STC 800, ASRC can measure the deformation curvature of engine fan blades, implement multi axis probing technology and determine the optimum machining parameters of the fan blade for uniformity of form and accuracy of the refurbished components. A mechanised method to remove distortion from turbine backing ring seals was also developed. As a result, the turnaround time for refurbishment has been reduced from three days to one and accuracy increased by more than 90%.

### Laser projected drilling templates and robotic drilling

The ASRC utilises a laser tracker or other 3D measuring devices and a software system to accurately produce drilling templates for manual drilling on new replacement panels. Researchers have also developed a laser tracking technique and software system to measure the hole positions and transmit drilling location information to a pair of robotic arms, which drill those holes automatically. Replacement time can be reduced from five hours to less than half an hour.

### 飛機引擎扇葉和渦輪封環維修

中心引入五軸式加工系統 Starrag STC 800，量度引擎扇葉變形的弧度，利用多軸式加工技術，計算扇葉的最佳加工參數，以確保經整修部件形狀的一致性和精確度。此外，中心亦研發了一部機器將已變形的渦輪封環壓回原狀。所需維修時間由三日縮短至一日，維修的準確度亦提升超過百分之九十。

### 激光投射鑽孔模板及機械鑽

中心運用激光追蹤器或其他三維測量儀器和軟件系統準確製作模板，將模板放在新的外層組件上再標上鑽孔位置，然後配以手動鑽孔。科研人員亦研發出激光追蹤技術和軟件程式以計算鑽孔位置，再發送鑽孔位置信息至一對機械手，以全自動化模式鑽孔。這些模式能有效將維修時間由五小時縮短至少於半小時。

# MAJOR AWARDS FOR RESEARCH AND DEVELOPMENT PROJECTS

## 獲獎科研項目

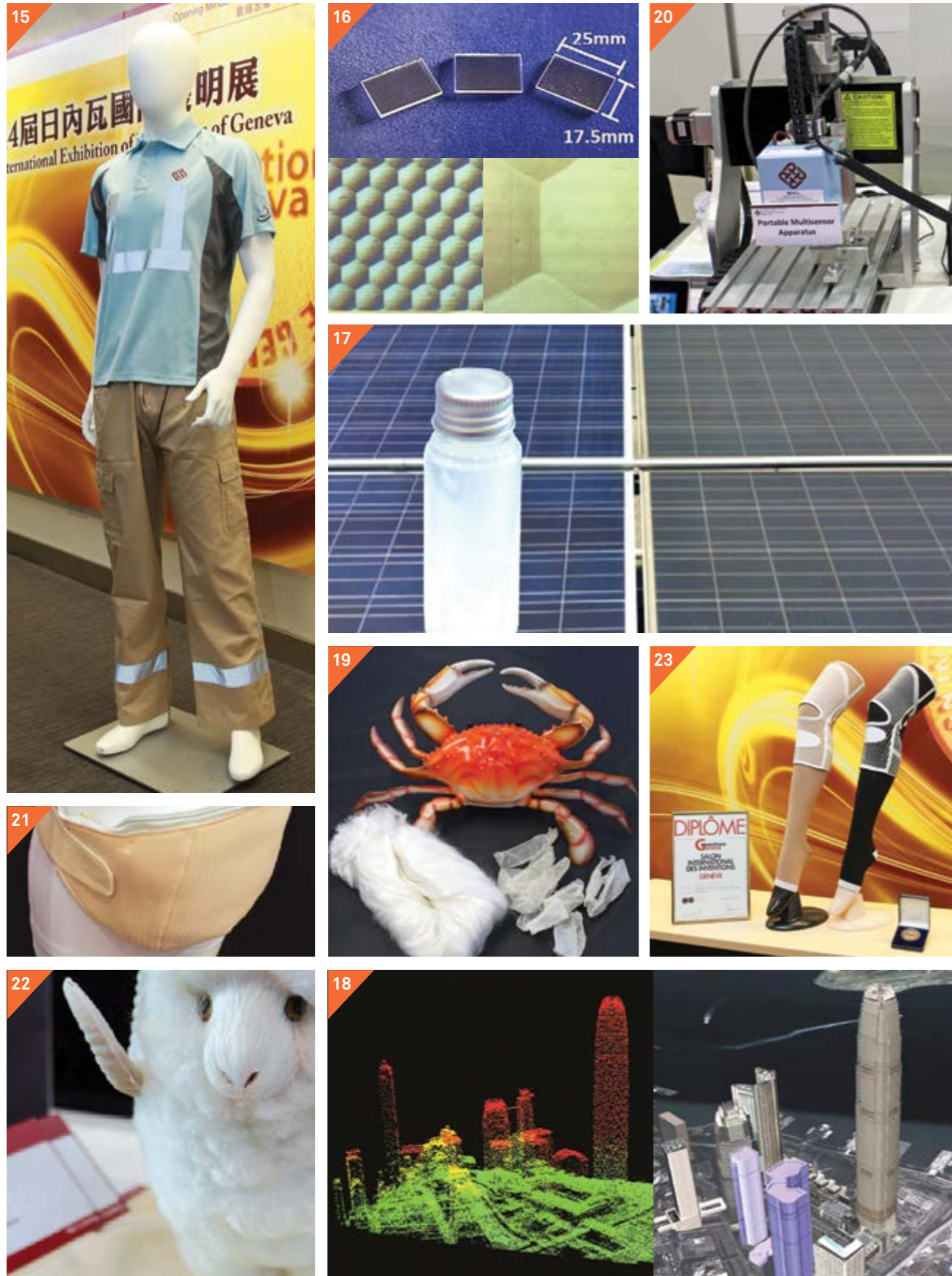


2015 Seoul International Invention Fair 2015年韓國首爾國際發明展

Award 獎項	Project 項目	Principal investigator/Department 首席研究員/學系
11 Gold Prize and Special Merit Award 金獎及特別優異獎	Body integrated supercapacitor for the next generation of electric vehicles 新一代電動汽車的車身集成超級電容	Prof. Eric Cheng Ka-wai, Department of Electrical Engineering 電機工程學系鄭家偉教授
12 Gold Prize and Special Merit Award 金獎及特別優異獎	Thermal and moisture comfort mastectomy bra and prosthesis 具舒適溫感及濕度的義乳及胸罩	Dr Kristina Shin, Institute of Textiles and Clothing 紡織及製衣學系Kristina Shin博士
13 Silver Prize and Special Merit Award 銀獎及特別優異獎	Aqueous manganese dioxide ink for flexible energy storage devices (more on p.61) 靈活應用於儲能設備的水性二氧化錳墨水 (詳見第61頁)	Dr Yuan Jikang, Department of Applied Physics 應用物理學系袁嵇康博士
14 Bronze Prize 銅獎	iWheelchair 智能輪椅系統	Ir Dr Eric Tam, Interdisciplinary Division of Biomedical Engineering 生物醫學工程跨領域學部譚永昌博士工程師







44th International Exhibition of Inventions of Geneva 第四十四屆日內瓦國際發明展

Award 獎項	Project 項目	Principal investigator/Department 首席研究員/學系
15 ▽ Grand Prize and Gold Medal 特別大獎及金獎	Anti-heat stress clothing for construction workers 建造業工人抗熱工作服	Ir Prof. Albert Chan Ping-chuen, Department of Building and Real Estate 建築及房地產學系陳炳泉教授工程師
16 ▽ Grand Prize and Gold Medal 特別大獎及金獎	Compound eye high definition 3D imaging system 高清三維成像複眼透鏡系統	Ir Prof. Lee Wing-bun, Department of Industrial and Systems Engineering 工業及系統工程學系李榮彬教授工程師
17 ▽ Gold Medal and Special Merit Award 金獎及特別優異獎	Highly dispersed nanocomposite paste for self-cleaning photovoltaic panels 用於自動清潔太陽能光伏板的高分散納米塗料	Prof. Yang Hongxing, Department of Building Services Engineering 屋宇設備工程學系楊洪興教授
18 ▽ Gold Medal and Special Merit Award 金獎及特別優異獎	Precise topographic mapping model 高精度地形測繪計算模型	Dr Wu Bo, Department of Land Surveying and Geo-Informatics 土地測量及地理資訊學系吳波博士
19 ▽ Gold Medal 金獎	Innovative spinning system for chitosan yarn 創新殼聚糖紗線紡紗系統	Dr Li Li, Institute of Textiles and Clothing 紡織及製衣學系李麗博士
20 ▽ Gold Medal 金獎	Portable multisensor apparatus for in-situ high dynamic range 3D measurement 用於原位高動態範圍三維測量的可移植多傳感器裝置	Prof. Benny Cheung Chi-fai, Department of Industrial and Systems Engineering 工業及系統工程學系張志輝教授
21 ▽ Silver Medal and Special Merit Award 銀獎及特別優異獎	Smart fetal monitoring belt 智能胎兒監護帶	Prof. You Jia, Department of Computing 電子計算學系尤佳教授
22 ▽ Bronze Medal 銅獎	Development of superfine wool products 超細羊毛產品的開發	Dr Shang Songmin, Institute of Textiles and Clothing 紡織及製衣學系尚頌民博士
23 ▽ Bronze Medal 銅獎	Leg guarder kit 腿衛士套具	Dr Guo Xia, Department of Rehabilitation Sciences 康復治療科學系郭霞博士