10/11

Sparks of Innovations
創意之源

Annual Report 2010/2011 年報

ASTRI™

香港應用科技研究院有限公司
Hong Kong Applied Science and Technology Research Institute Company Limited

Mission and Goals
使命與目標

ASTRI's mission is to enhance Hong Kong's competitiveness in technology-based industries through applied research. It has the following goals:

- Perform relevant and high quality R&D for transfer to industry;
- Enhance Hong Kong's technological human resources development;
- Act as a magnet attracting international R&D talent to work in Hong Kong;
- Act as spawning ground for technology entrepreneurs;
- Promote greater technological applications in industry; and
- Provide a focal point for industry-university collaboration.

應科院的使命是要透過應用科技的研究，協助發展以科技為基礎的產業，藉此提升香港的競爭力。其目標包括：

- 進行相關及高水平的科技研究發展工作，並把科研成果轉移給工業界；
- 增強本港科技人才的實力；
- 吸引海外從事研究發展的專才來港工作；
- 培育科技企業家；
- 鼓勵將科技廣泛應用於工業方面；及
- 作為工業界與大學合作的橋樑。

ASTRI literally means “star” in Italian. The star-shaped logo symbolizes vitality, inspiration and centre of attention. It portrays ASTRI emitting sparks of innovations and leading the way forward, reflecting the qualities of a professional research institute.

ASTRI 在意大利文是「明星」的意思 。星形標誌充滿活力和創意，光芒四射 。其設計象徵應科院是靈感的泉源， 引領科技潮流 ，充份展現一所專業研究院應具備的特質 。

A Decade of Growth
十載耕耘

2000
ASTRI was founded by the HKSAR Government
香港特區政府成立應科院

2003
ASTRI's base relocated to Hong Kong Science Park to accommodate further development
將基地遷移至香港科學園以配合進一步發展

2008
Launched Industry Collaborative Project scheme and signed the first three agreements
推出「業界合作項目」計劃，並簽訂首三份合約

2010
ASTRI celebrated its first 10th Anniversary
應科院十週年誌慶

Completed over
完成超過
360
technology transfers
項技術轉移

Received income from industry at over
從業界取得收入超過
$160
million (HK$)
百萬（港元）

More than
超過
550
patents filed
項發明專利申請

130
patents granted
項發明專利獲批

Launched 10 ICPs with committed income from industry close to
展開十個「業界合作項目」，簽訂合約總額接近
$47
million (HK$)
百萬（港元）

The Hong Kong Applied Science and Technology Research Institute (ASTRI) was founded by the Government of the Hong Kong Special Administrative Region in 2000 with the mission to enhance Hong Kong's competitiveness in technology-based industries through applied research.

In the short period of 10 years, ASTRI developed into an active and conscientious research institute driving the growth of the technology sector by continuously transferring to its industrial partners innovative and marketable technologies for commercialization in local and international markets.

香港應用科技研究院（應科院）由香港特別行政區政府於2000年成立，其使命是要透過應用科技的研究，協助發展以科技為基礎的產業，藉此提升香港的競爭力。

短短十年間，應科院已漸漸發展成為一所充滿活力和專業的研究院。應科院持續轉移其創新和適合市場的技術予工業界，在本地和國際市場進行商品化，藉此推動科技產業的發展。

2004
Completed the first spin-off of photonic technologies to SAE Magnetics (HK) Ltd.
完成首宗業務分拆，將光電子構裝技術售予香港新科實業有限公司

2005
Spun off wireless technologies to Marvell Technology Group Ltd.
分拆無線電技術予俊茂微電子

HONG KONG R&D Centres 香港研發中心

2006
Spun off WiFi technologies to Altai Technologies Ltd.
分拆WiFi技術予奧泰爾科技有限公司

2006
Designated the Hong Kong Research and Development Centre for Information and Communications Technology by the Innovation and Technology Commission
獲創新科技署委派承辦「 香港資訊及通訊技術研發中心 」

2008
Set up ASTRI Science and Technology Research (Shenzhen) Co. Ltd., a wholly-owned subsidiary on the Mainland
在深圳成立全資附屬公司「應科院科技研究（深圳）有限公司」

Many of these new technologies were successfully adopted by famous brands for their products or services, such as WiFi, 4G wireless broadband, HD set-top box, noise cancellation headphone, pico-projector, e-learning, LED lighting, low-field MRI and many others, creating business opportunities and economic impacts on the one hand, while bringing benefits and improved lifestyle to people on the other.

While engaging in R&D ventures, ASTRI also successfully produced a volume of intellectual properties and nurtured many research talent and entrepreneurs. They are critical factors for sustaining the industry's growth and success.

Building on such good foundation, ASTRI is well on its way to breaking new grounds and emerging as an influential and world-class research institute in the foreseeable future.

其中多項技術已獲著名品牌採用來開發新產品或新服務，例如WiFi、4G無線寬頻、高清機頂盒、噪音消除耳機、微型投影機、電子學習、LED照明、低場磁力共震等等。一方面為市場帶來商機及創造經濟效益；另一方面改善人類生活，貢獻社會。

在進行研發工作期間，應科院成功註冊了多項知識產權，並且培養了不少研究員和企業家，這些都是業界賴以成長和取得成功的關鍵。

由於已建立一個良好基礎，應科院現已蓄勢待發，準備開拓新領域。相信在可見的未來，將會成為一所具影響力及世界一流的研究院。

Organized/ took part in
每年舉辦／參與
500
activities every year
項活動

Obtained more than
獲得超過
20
local/ international awards
個本地／國際獎項

Chairman's Foreword
主席序言

I take great pleasure in presenting this Annual Report which elaborates ASTRI's continuous progress and enviable achievements during the period 1 April, 2010 to 31 March, 2011.

During the year, ASTRI proudly concluded its first decade of development with distinguished performance in terms of support from industry, technology transfers, patents granted and other key performance indicators. As Chairman of the Board, I would like to take the opportunity of extending my most heartfelt appreciation to the unfailing support from both the Government and community. I would also pay tribute to all ASTRI staff for their tremendous efforts and total commitment in enabling the institute to go from strength to strength throughout its first 10 years.

Also, I must gratefully, though sadly, bid farewell to four Directors who retired from the Board during the year, namely Mr. Duncan Pescod, former Permanent Secretary for Commerce and Economic Development (Communications and Technology); Dr. Jacqueline Lui Chiu-tong; Professor Vincent Shen and Mr. Ben Wong Chung-mat. On behalf of the Board, I wish to express profound appreciation for their invaluable contribution over the years. I have no doubt that we at ASTRI can continue to count on their support and advice in the months ahead.

On the other hand, I wish to extend warm welcome to Miss Elizabeth Tse Man-yee, Permanent Secretary for Commerce and Economic Development (Communications and Technology), to join the Board as a new Official Member, as well as three other new Directors who began their tenure in October 2010. They are Professor Andrew Chan Chi-fai, Director, EMBA Programme, The Chinese University of Hong Kong; Mr. George Hongchoy Kwok-lung, Executive Director and Chief Executive Officer, The Link Management Limited; and Ms Agnes Nardi Kar-wai, Chief Operating Officer, Business Environment Council. I strongly believe that with the wealth of experiences in their respective fields, they will work closely with their colleagues on the Board to steer ASTRI to a new level of development.

本人謹此呈交應科院本年度年報，當中闡述了本院於二零一零年四月一日至二零一一年三月三十一日期間持續的發展和令人鼓舞的業績。

應科院本年在業界支持、技術轉移、獲取專利及其他主要業績指標表現傑出，昂然完成了首十年的發展。我謹以董事局主席身份，藉此機會向一直以來大力支持應科院的政府和社會各界表示衷心謝意。也由衷感謝本院上下仝人，他們付出了巨大努力，對工作全情投入，使應科院在創辦首十年得以穩步發展，屢創高峰。

此外，我也懷著感激之情，與四位是年度內卸任的董事惜別，他們是前商務及經濟發展局常任秘書長（通訊及科技）柏志高先生、呂許昭棠博士、沈運申教授及王忠秣先生，他們多年來對應科院貢獻至鉅，本人謹代表董事局致以至誠的謝意，並深信他們今後仍會繼續支持和指導應科院的發展。

與此同時，我們熱烈歡迎商務及經濟發展局常任秘書長（通訊及科技）謝曼怡女士加入董事局成為官守董事，以及三位於二零一零年十月履任的董事，他們是香港中文大學行政人員工商管理碩士課程主任陳志輝教授、香港領匯管理有限公司執行董事兼行政總裁王國龍先生及商界環保協會常務總裁李家慧女士；我深信他們必會與董事局其他成員緊密合作，憑藉其在所屬界別的豐富經驗，領導應科院向前邁進。

應科院作為一所由公帑資助的研究院，必須致力維持最高標準的企業管治，竭力達至最高的運作透明度和問責性。年度內，管理層在董事局指導下採用了平衡計分卡，為各個運作層面訂立了清晰目標。我相信應科院憑藉這新方法，不但更能把運作焦點從量轉向質，也能在日後的工作中充分回應社會的需求和期望。

During the year, ASTRI proudly concluded its first decade of development with distinguished performance in terms of support from industry, technology transfers, patents granted and other key performance indicators.
應科院本年在業界支持、技術轉移、獲取專利及其他主要業績指標表現傑出，昂然完成了首十年的發展。

Patrick Wang Shui-chung, PhD, SBS, JP
Chairman of the Board
董事局主席 汪穗中博士

As a publicly funded research institute, ASTRI is committed to upholding the highest standards of corporate governance, dedicating unreserved effort to achieve maximum transparency and accountability in its operation. During the year under review, the management, steered by the Board, has adopted the Balanced Scorecard format to establish clear targets in its different facets of operation. I am confident that this new approach to its operation will not only enhance ASTRI's focus on quality over quantity, but will also enable the institute to become increasingly answerable to the needs and expectation of the community in its future endeavours.

Furthermore, to enable the Board and management to monitor and manage risks in a systematic manner, the Board, during the year, has completed a risk assessment exercise across ASTRI. Thanks to the painstaking efforts of members of the Audit Committee and Finance and Administration Committee, key strategic and operational risks were identified and as a result, the internal control system was evaluated and improved.

I firmly believe that to strengthen its long term competitiveness, Hong Kong has to bolster up its development in technology and innovation. On the global scene, information and communication technologies, such as tablet computers, USB 3.0 and 4G wireless networks, made headlines during the year. Such technological advances were welcomed by both consumers and businesses as they not only created sustainable economic impacts, but also changed the ways people interacted as well as their business operations. With major concepts such as cloud computing, e-healthcare and green energy taking centre stage, we can expect lifestyle in the forthcoming decade to be more technology-reliant than ever.

While most people around the globe are still struggling to cope with the painfully slow economic recovery from the 2008 financial tsunami, world leaders are looking at technological innovations as one of the critical forces that will propel the economic engine. However, Hong Kong has been lagging far behind our arch rivals in R&D investment. I must again point out that to maintain our leading position as one of the most competitive cities in the world, as well as not to jeopardize our chance of success in the future, we must pursue continuous growth in technology and innovation by increasing our R&D spending in both public and private sectors.

為了讓董事局和管理層日後得以系統化地監控和管理風險，董事局在年內完成了應科院的整體風險評估。感謝審計委員會和財務與行政委員會各委員不辭勞苦，辨識出主要的策略性和營運性風險，內部控制系統也因此得到了評估和改良。

Dr. Wang (left) presents a souvenir to the Financial Secretary Mr. John Tsang thanking him for officiating at the 10th anniversary celebration commencement ceremony
汪博士（右）致送紀念品予財政司司長曾俊華先生，感謝對方蒞臨應科院主持十周年慶典啟動禮

我堅信香港要增強長線競爭力，必須進一步支持科技創新的發展。過去一年，資訊及通訊技術的新進展，例如平板電腦、USB 3.0 和第四代無線網絡，在世界各地大受注目。科技的進步受到消費者和企業歡迎，它不但帶來了可持續的經濟效益，也改變了人們交往及商界經營的方式；隨著雲端計算、遠程保健和綠色能源等議題愈來愈受重視，可以預見科技在未來十年將較以往更深遠地影響我們的生活方式。

現時世界上大部分人仍在努力適應二零零八年金融海嘯後極其緩慢的經濟復蘇，各國領袖則視科技創新為驅動經濟發展的關鍵動力之一；可是，香港在這方面的投資遠遠落後主要競爭對手。我必須再次指出，要維持香港作為世界上最具競爭力的城市之一，及保障將來的成功，我們的公共部門和工商界必須增加研發支出，務使科技創新持續成長。

我還想列出另一個充分的理由去支持增加研發投資。今年較早前，全國人民代表大會通過了第十二個五年計劃，一扇機會之窗已為香港開啟。按照規劃，中央政府將培育和發展七大與科技相關的新興產業，估計未來五年投放資金達十萬億元人民幣。對香港來說，這個國家策略不但是對國家發展作出貢獻的適當機會，也是把綜合競爭力推向高峰的大好時機。香港對時勢作積極回應，須著眼於本身的強項，並增加資源以促進研發活動的發展。

There is another resounding reason for increasing our investment in R&D. A window of opportunity was opened for Hong Kong earlier this year when the National People's Congress approved the 12th Five-Year Plan. According to the plan, the Central Government will nurture and develop seven new technology-based strategic industries, with investments projected to reach RMB 10 trillion over the next five years. To Hong Kong, the national strategy means a timely opportunity not only to contribute to national development, but also to take our integrated competitive strength to new heights. To positively respond to the circumstances, Hong Kong needs to focus on its forte and fuel its R&D activities with increased resources.

Dr. Wang (left) accompanies the Secretary for Commerce and Economic Development Mrs. Rita Lau Ng Wai-lan during a technology demonstration
汪博士（左）陪同商務及經濟發展局局長劉吳惠蘭女士參觀技術演示

In view of the new opportunities and competitive demands, Hong Kong must take swift actions to further promote innovation and technology. I am glad that the Government shares this view and is considering positive measures to elevate our city's R&D capability. I hope the private sector will correspondingly step up its R&D investment in exchange of long-term return.

Embarking on its next phase of growth, ASTRI is well poised to partner with Government, industry and academia to translate R&D creativity in information and communication technologies into commercialized applications enhancing positive social and economic impacts. With the mission of enhancing Hong Kong's competitiveness, ASTRI, backed by the continuous support of the Government and a 500-strong team of R&D professionals, welcomes different scales of collaboration with industries to help them tackle the challenges ahead.

In the new decade when effective and successful competitors are differentiated from the rest by their advancement in technology and innovation, I am confident ASTRI will assume an increasingly important role in unleashing Hong Kong's technological potential and become one of the most sought-after R&D partners in the region.

香港要把握機會和面對競爭，必須迅速行動，進一步推動創新和科技。我樂意看到政府也同意這個看法，並正研究積極的措施來提升香港的研發能力。我希望工商界也能相應地增加研發投資，換取長線回報。

應科院正進入新的成長階段並已準備就緒，與政府、業界和學術界合作把資訊及通訊科技的研發創意轉化為商業應用，帶來社會和經濟效益。應科院以促進香港競爭力為宗旨，得到政府不斷支持，並擁有五百多名研發專才，非常樂意與業界在不同層面上加強合作，協助合作夥伴克服前面的挑戰及充分把握發展的契機。

在未來十年，競爭者將憑科技和創新上的進步脫穎而出，取得成功。在政府及各界的支持下，我深信香港定能不斷發揮科技潛能，而應科院也充滿信心地肩負愈來愈重要的責任，推動科研發展，並且成為區內最受歡迎的研發合作夥伴之一。

Patrick Wang Shui-chung, Chairman of the Board
董事局主席 汪穗中

Chief Executive Officer's Review
行政總裁回顧

The year 2010-2011 has been a very special and memorable one for ASTRI as the institute celebrated its first 10th Anniversary, marking an important milestone and accentuating an appropriate time for us to review our past and plan our future.

A decade after inception, ASTRI expanded and developed into a well-established research institute. I would like to extend my most sincere gratitude to the Government, partners, friends and colleagues for their numerous years of unwavering support and contributions, without which ASTRI would not have accomplished as much as it has today.

I am most delighted to report that 2010-2011 has been another successful year for ASTRI. We completed 75 technology transfers to industry and received from the same sector an income of HK$61 million, representing a substantial 29 per cent increase from the previous year. This vast sum has again reflected well that industry has a high level of confidence and interest in the marketable technologies ASTRI developed.

The total number of ITF-funded projects undertaken by ASTRI during the year was 93, including new and ongoing seed, platform and collaborative projects. Of these, 44 were new projects, a slight drop from last year. This is mainly due to our strategy of focusing more on quality rather than quantity in the initiation of new projects. However, the number of new and ongoing contract research projects entrusted by our partners remained high at 77. This is good indication of strong market demand for high quality and customer-focused R&D services offered by ASTRI.

There was also a continuous increase in the volume of intellectual properties (IP). The number of patent applications filed and granted in the period under review was 87 and 65 respectively, taking the total number of applications filed to more than 550 with 130 patents granted. Our objective is to build a portfolio of home-grown and right-protected IPs readily available for customer deployment.

二零一零至二零一一年正值應科院慶祝成立十周年，對本院仝人來說是別具意義和值得紀念的一年。十周年標誌著應科院發展的一個重要里程碑，借此良機，也正好讓我們回顧過去，計劃未來。

應科院自二千年成立以來短短十年間，已逐漸擴展成為一所具規模的專業研究院。全賴政府、合作夥伴、各界好友和同事們的熱心支持和無私付出，才造就了應科院今天的驕人成果，本人謹致以最真誠的謝意。

本人欣然向大家報告，應科院在二零一零至二零一一年再次取得令人滿意的成績。年內我們轉移了七十五項技術予工業界，從業界獲得港幣六千一百萬元收入，較往年大幅增加百分之二十九。此項理想收益，充分反映出本院所開發的科技能迎合市場並深受業界信賴和歡迎。

去年由創新及科技基金資助應科院的科研項目，包括全新及進行中的種子、平台及業界合作項目總數共九十三項，當中四十四個是新項目，數目較往年輕微下降。主要原因是由於本院對於開展新項目，採取了以質代量的新策略。然而由合作夥伴委託本院承辦的合約研究項目，包括新簽訂及進行中的項目，仍高達七十七項。這正好反映市場對本院所提供的高水平及以顧客為中心的研發服務仍然需求甚殷。

本院所擁有的知識產權數目也有所增加。在審計年度內，我們所提交的專利申請及獲發專利數量分別為八十七項及六十五項，令申請專利的累積數字超過五百五十項，獲發專利總數達一百三十項之多。我們的目的是要建立一個由本地開發和受保護的知識產權庫，供客戶使用，藉此加強本地產業的競爭能力，為業界發展帶來長遠而正面的影響。

I would like to extend my most sincere gratitude to the Government, partners, friends and colleagues for their numerous years of unwavering support and contributions, without which ASTRI would not have accomplished as much as it has today.
全賴政府、合作夥伴、各界好友和同事們的熱心支持和無私付出，才造就了應科院今天的驕人成果，本人謹致以最真誠的謝意。

Cheung Nim-kwan, PhD, Chief Executive Officer
行政總裁 張念坤博士

Dr. Cheung with Fujian Party Secretary, Ms. Sun Chunlan
張博士與福建省委書記孫春蘭女士合照

This way, we enhance the competitiveness of the local industry and create long-term positive impact for Hong Kong. To improve patent quality and ensure that only fundamental patents with strong commercialization prospect will be filed, a revised set of patent application criteria and management procedures will be put into effect in June 2011 for evaluating patent applications and managing our IP portfolio.

It is particularly worth mentioning that ASTRI made remarkable progress in commercializing our technologies. Prominent examples include a US$2 million contract licensing exclusively the world's smallest anti-shaking mobile phone camera module to a Hong Kong-based company for tapping the global market, and the trial use of an ASTRI-powered e-learning device – MyID in more than 30 local schools. More examples of commercialization are elaborated in subsequent chapters of this report. It gives me immense pride and satisfaction to see ASTRI constantly creating benefits for society and individuals with innovative and practical technologies.

The Industry Collaborative Project (ICP) scheme, which was designed to enable ASTRI and partners to leverage each other's strengths and resources to reduce risks and increase chances of success, continued to attract new players. Since ICP was launched in 2008, the number of projects has reached 10 with aggregate committed income close to HK$47 million.

為提升專利素質並確保所有提交的專利申請都是具備市場化條件的基礎專利，應科院將於二零一一年六月開始實施一套重新修訂的專利申請標準及管理程序，用以評估專利申請及管理知識產權。

特別值得一提的是應科院在科技商品化方面取得的進展尤其顯著。其中一個成功例子是本院與一家以香港為基地的公司簽訂了價值二百萬美元的合同，將全球體積最小的手機相機防震模組授權予該公司開發新產品，以進軍世界市場。另一例子是利用本院技術開發的電子學習器MyID已在全港超過三十間學校試用。其他商品化例子詳載於本年報其他的章節。應科院能夠利用自身開發嶄新而且實用的科技，造福個人以至社會，令本人感到十分驕傲和欣慰。

此外，專為應科院和業界結合雙方優勢和資源來合作發展新技術，從而降低風險和增加成功率而設計的「業界合作項目」計劃，不斷吸引新合作夥伴參與。「業界合作項目」計劃自二零零八年推出以來，已有十個合作項目成功展開，業界承諾的投資金額，接近港幣四千七百萬元。

去年創新科技署大力鼓吹「在公共機構應用創新科技」計劃，為應科院將科技作公共用途提供了契機。本院已經與各政府機構，包括路政署、房屋署、教育局、醫院管理局及執法部門開始了數項合作計劃。相信這些跨領域合作的項目，將可惠及參與項目人士及市民大眾。

應科院希望透過此計劃積極向公眾推廣應用科技，並響應創新科技署呼籲「官、產、學、研」必須加強聯繫以達致更大的協同效益。本人深信只要四方面能夠緊密合作，朝著共同目標而努力，我們必定能夠進一步拓展本港以科技為基礎的產業，同時提升人類的生活素質。

Last year, the Innovation and Technology Commission (ITC) initiated the "Promotion of Innovation and Technology in the Public Sector" programme, giving ASTRI opportunities to put our technologies into public applications. ASTRI has already embarked on several projects with various Government agencies such as Highways Department, Housing Department, Education Bureau, Hospital Authority and law enforcement agencies. I am sure these projects, which require cross domain cooperation, will bear fruits for all parties involved, particularly the public, in the near future.

ASTRI's active participation in the programme reflects our positive response to ITC's call on the Government, industry, academia and research institutes to build a stronger link for achieving greater synergy. I strongly believe the four sectors can work closely together towards the common goal of developing and strengthening Hong Kong's technology-based industry, while at the same time further enhancing quality of life.

This strong conviction has propelled us to extend our reach and forge closer collaboration with our counterparts in the region. During the year, ASTRI signed many important agreements with governments, academia and enterprises on the Mainland and overseas, paving way for further cooperation on various technological fronts. We will continue expanding our network to facilitate collaboration and commercialization.

As many of you are aware, technology development is one of the main focuses in China's 12th Five-Year Plan and Beijing has explicitly expressed support for developing the six pillar industries, which include innovation and technology in Hong Kong. While we are greatly encouraged by the steadfast support from both Governments and the future's positive outlook, we know full well the challenges ahead and the increasing expectation for ASTRI to play the role of front-runner in industry.

The best way of rising to the occasion is responding proactively by charting the right direction for our institute and maximizing our resources in achieving our goals. In the new fiscal year, apart from developing the core competencies of our five R&D domains, ASTRI will explore new technologies, including green energies and tele-health. A new Key Technology Initiative has already been started with the establishment of an Exploratory Research Lab for emerging and inter-disciplinary technologies identified with having good business potential.

這個堅定信念驅使我們更積極加強與區內合作夥伴的聯繫。年內本院與國內及海外的政府機構、學院及企業簽署了多份重要協議，合作發展不同領域的科技。我們會繼續擴展我們的聯繫工作，以促成更多合作和技術商品化。

Dr. Cheung (left) officiates at the opening of the Hong Kong International Computer Conference
張博士（左）主持香港國際電腦會議開幕禮

Dr. Cheung (right) delivering a speech at the Hong Kong General Chamber of Commerce
張博士（右）於香港總商會發表演講

相信大家都留意到，科技發展是中國第十二個五年計劃的一個重點。中央政府已明確表示對香港發展六大優勢產業，當中包括創新科技產業的支持，令我們深感鼓舞；對於行業的發展前景，我們也感到非常樂觀。由於各界對應科院擔當行業領導者的角色寄予厚望，使我們有如履薄冰的感覺，但我們一定會全力以赴，力爭上游，以克服面臨的挑戰。

積極面對未來的最好方法，是為研究院訂立正確的發展方向及善用資源來實現我們的目標。在新的財政年度，除了繼續發展現有的五個核心研發領域，本院將會開發包括環保能源和遠程醫療等新技術。目前我們已建立了一個「信息研究室」，專門研發有優厚商業潛質的新興及跨領域科技。

Dr. Cheung with Belilios Public School students who won two major awards in 2010 Joint School Science Exhibition
張博士與庇理羅士女子中學學生合照，該校在2010聯校科學展覽中贏得兩項大獎

Meanwhile, we will not lose sight on recruiting and nurturing talent as they are the critical factor behind our success, as well as the cornerstone for future development of industry. ASTRI will continue to be an incubator of high quality professional engineers. As at 31 March, 2011, our workforce stood at 585, with 87 per cent involved in R&D. The size of administrative manpower, as well as the related expenditures, on the other hand, has been kept at a relatively low level.

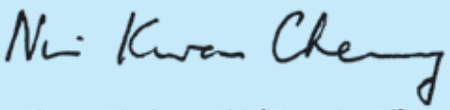
Most importantly, we will hold firmly to our commitment of serving industry and the people. We will foster industry growth and enhance people's lifestyle by providing technologies catering to market needs, together with a high propensity for application and commercialization.

As colleagues rejoice and reminisce a decade of exceptional growth and outstanding achievements, we are well prepared to meet the challenges ahead. I firmly believe that with our determination to excel, together with continual support from the Government and other stakeholders, ASTRI will continue to flourish and proudly emit "Sparks of Innovations" for Hong Kong and the world.

另一方面，我們也不會忽略招聘和培育人才。因為人才是我們成功的關鍵因素，也是業界未來發展的重要基石。在這方面，應科院繼續充當孕育優秀和專業工程師的搖籃。截至二零一一年三月三十一日止，本院員工人數達五百八十五人，當中百分之八十七負責研發工作。負責行政工作的員工人數以及相關開支則維持在較低水平。

最重要的是，我們會堅守服務業界和大眾的承諾。我們會繼續透過開發配合市場需要、實用性高及商品化潛力優厚的科技，來促進業界發展和優化人們的生活模式。

當本院仝人歡聚一堂，緬懷過去十年應科院的迅速發展和傑出成就的同時，我們已準備就緒迎接未來挑戰。我深信憑著我們追求卓越的毅力和決心，加上政府及各界給予的支持和鼓勵，應科院將可以繼往開來，成為創意之源，為香港和全世界作出貢獻。



Cheung Nim-kwan, Chief Executive Officer
行政總裁 張念坤

Anniversary Year in Capsule
十周年大事紀要

23.04.2010

ASTRI unveiled its year-long celebration of the 10th Anniversary with a commencement ceremony officiated by (from left) Secretary for Commerce and Economic Development Mrs. Rita Lau Ng Wai-lan; Chairman of the ASTRI Board Dr. Patrick Wang Shui-chung; Financial Secretary Mr. John Tsang Chun-wah; Chair of the Shenzhen side of the Steering Group on Shenzhen-Hong Kong Cooperation in Innovation and Technology Professor Liu Yingli; and ASTRI CEO Dr. Cheung Nim-kwan. More than 250 guests from Government, industry and academia attended the ceremony.
應科院舉行成立十週年慶典啟動禮，為長達一年的慶祝活動揭開序幕，儀式由財政司司長曾俊華（中）、深港創新及科技合作督導會議深圳方主席劉應力教授（右二）、商務及經濟發展局局長劉吳惠蘭女士（左一）、應科院董事局主席汪穗中博士（左二）及行政總裁張念坤博士一同主持。逾二百五十位來自政府、業界和學術界嘉賓出席了典禮。

10th Anniversary Logo
十週年標誌

20.07.2010

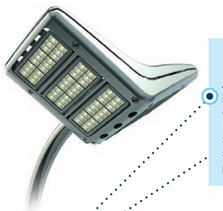
Permanent Secretary for Commerce and Economic Development Miss Elizabeth Tse (centre) visited ASTRI.
商務及經濟發展局常任秘書長謝曼怡女士（中）到訪應科院。

27-31.08.2010

ASTRI supported student scientists by being the gold sponsor of the Joint School Science Exhibition for the second year. Students from Belilios Public School won the "ASTRI Innovation Award" as well as the Overall Award with their invention "Smart Plug".
應科院為支持青少科學家，連續兩年成為聯校科展的金贊助。庇理羅士女子中學以「聰明拖板」榮獲「應科院創新科技獎」及全場冠軍獎。

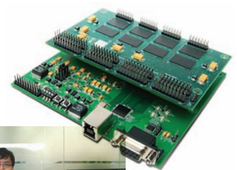
30.09.2010

ASTRI signed an agreement with AP Photonics Limited licensing its home-grown, anti-shaking compact camera module technologies to the latter for tapping the global camera phone market. Commissioner for Innovation and Technology Miss Janet Wong and Chairman of ASTRI Board Dr. Patrick Wang witnessed the signing ceremony.
應科院將自主開發的光學防震微型攝像模組技術授權予愛佩儀光電技術有限公司，後者將會利用該創新技術進軍環球相機手機市場。創新科技署署長王榮珍女士及應科院董事局主席汪穗中博士見証簽約儀式。



01.09.2010

A total of 20 energy-saving and high brightness LED street lamps powered by ASTRI technology were erected along a major road in Hong Kong Science Park for a one-year field test.
在香港科學園的一條主要道路上，安裝了二十盞以應科院技術開發的低耗電和高亮度的環保LED路燈，作為期一年的實地試驗。



01.05.– 31.10.2010

The world's first TD-LTE dongle jointly developed by ASTRI and its partners was used in the TD-LTE showcase network set up by China Mobile at the Shanghai World Expo, exposing visitors to totally new experience in 4G wireless broadband communications.
由本院與業界夥伴合作開發的全球首張TD-LTE數據卡，獲中國移動在上海世博會佈置的TD-LTE試驗網絡使用，為遊人帶來全新第四代流動寬頻通訊體驗。

09.08.2010

ASTRI joined forces with Velosti Technology Limited, a technology firm based in Silicon Valley, in an Industry Collaborative Project to co-develop USB 3.0 chip to serve the needs of the fast growing market.
應科院與一間以矽谷為基地的科技公司Velosti Technology Limited展開「業界合作項目」，合作發展USB 3.0晶片，以應快速增長的市場需要。

2010 4.5.6.7. 8.9.10.

25.08 & 15.09.2010

The annual ASTRI Industry and University Consultation Forums were held in Hong Kong and Shenzhen, attracting a total of more than 700 guests from industry and academia.
每年一度的應科院科技項目推介會先後在香港和深圳成功舉行，吸引逾七百名來自業界和學術界人士參加。

28-29.09.2010

ASTRI took part in the Hong Kong International Computer Conference showing support towards building a caring and digitally connected society. Photo shows ASTRI CEO Dr. Cheung Nim-kwan (left) who chaired the Programme Committee, presenting a Certificate of Appreciation to Mr. Albert Cheung for addressing the conference.
應科院積極參與以「IT展關懷」為主題的香港國際電腦會議，以行動支持建構一個充滿關愛的數碼化社會。本院行政總裁張念坤博士擔任程序委員會主席。圖為張博士（左）頒贈感謝狀予講者鄭經翰先生。

06-14.11.2010

ASTRI showcased new technologies for better living at the InnoCarnival 2010. The event attracted overwhelming media and public attention. Nearly 38,000 people visited ASTRI's digital home during the show.
應科院在「創新科技嘉年華2010」展示一系列環繞創造美好生活主題的智能新科技，引起傳媒和市民的極大興趣，入場參觀本院智能家居展位人數接近三萬八千人。

27.02.2011

An 80-member delegation from ASTRI comprising enthusiastic staff and their family members participated in the Walks for Millions raising fund for the Community Chest's children and youth services.
由本院員工及家屬組成的八十人隊伍，浩浩蕩蕩地參加了公益金百萬行，為香港公益金的兒童及青年服務籌款。

01.03.2011

ASTRI and RM Technology Co. Ltd. from Chengdu signed an agreement to co-develop two high-speed data processing integrated circuit modules aimed to be used in the communication system of China's high-speed trains.
應科院與成都雷電微力科技有限公司簽訂協議，合作研發兩套高速資料處理集成電路模組，目標是在中國高速鐵路的無線通訊系統中使用。

11.12. 2011 1.2.3.

04.11.2010

A delegation from the National Ministry of Industry and Information Technology visited ASTRI for better understanding of Hong Kong's R&D industry.
國家工業和信息化部代表團造訪應科院，以加深對香港科研發展的了解。

16-21.11.2010

ASTRI took part in the 12th China Hi-Tech Fair held in Shenzhen showcasing its state-of-the-art technologies and capturing the attention of thousands of visitors.
本院參展於深圳舉行的第十二屆「中國國際高新技術成果交易會」，展示最新的科研項目，吸引成千上萬與會者的關注。

25.11.2010

A Working Group on Android™ Applications was established by ASTRI and Hong Kong Science and Technology Parks Corporation to help industry members leverage opportunities in the burgeoning Android™ market by developing new applications.
應科院聯同香港科技園公司成立「Android™ 應用協作委員會」，目的是透過開發新的 Android™ 應用，幫助業界會員開拓新興 Android™ 市場帶來的商機。

30.03.2011

Fujian Party Secretary Ms. Sun Chunlan, who led a 500-member delegation on a five-day visit to Hong Kong and Macau in March, visited ASTRI. During this period, ASTRI signed several important agreements with the Fujian Provincial Government and enterprises to jointly develop new technologies.
福建省委書記孫春蘭女士率領五百人代表團於三月份一連五日訪問香港和澳門，此行包括訪問應科院。期間應科院與福建省政府及企業達成多項共同發展嶄新技術的重要合作協議。

Operation and Performance
營運與業績

Sparks of Brilliance Capture Attention
成就 吸引業界注目

Operation
營運

Management for Quality

As a publicly-funded applied research institute, ASTRI operates under the firm conviction it exists for maximizing "public good", which is measured by the economic impact and other benefits it brings to industry and the community. To generate and sustain economic impact, ASTRI vigorously focuses on customers and technology transfers.

Under the theme "customer-focused R&D", ASTRI's operations aim at maximizing R&D impact on customers and converting research into real results. The latter is a systematic process building customer focus into every aspect and every step of ASTRI's R&D programmes, from initiation to transfer of the generated intellectual properties (IPs) to customers.

In addition to developing world class IPs and transferring them to customers, ASTRI puts much emphasis on assuring the quality of both its researches and management processes.

優質管理

作為一家政府資助的應用研發機構，應科院堅守一個經營信念，就是以產生最大的「公眾利益」為目標，而此公眾利益是以應科院帶給業界和整體社會的經濟效益和其他得益來衡量。為了創造及維持經濟效益，應科院全力以赴，以顧客和技術轉移作為重點。

應科院的經營模式建立在「顧客導向研發」的主軸上，確保研發活動產生最大顧客效益，並使研究轉化為具體成果的過程系統化；這套系統化過程把顧客導向納入各研發項目的每一環節每一步驟—由研究計劃開始直至將所研發的知識產權移轉至客戶。

除了不斷努力研發世界級知識產權及將其有效地轉移給業界外，應科院對確保其研究和管理過程的質素也非常重視。

R&D Quality Assurance

To assure the quality of its R&D programmes, ASTRI conducts an Annual Planning Cycle comprising the following steps:

研發質素保證

為確保其研發項目的質素，應科院以年度週期作出規劃，當中包括以下步驟：

This process is also adopted for vetting and monitoring all ongoing R&D projects, which are reviewed by the Board between six to nine months from project commencement to evaluate effectiveness of customer engagement. Biannual reports are submitted to the Innovation and Technology Commission to examine project progress against stated milestones. The projects are also subject to quarterly reviews by the Board's Technology Committee and each ongoing project is monitored monthly for progress by ASTRI's Chief Technology Officer.

Focusing on improving patent quality to increase financial returns, the ASTRI management adopts a balanced measure that includes the number of patent applications filed, successful granting rate of patent applications and income from patent licensing to gauge success of its R&D outputs. Report on commercialization status for all pending and granted patents is submitted to the Technology Committee every six months.

此四步程序也用於查核和持續監控所有正進行的研發項目。這些項目均由應科院董事局於項目開始後六至九個月內審核，以評估其獲取顧客支持的成效。每半年向創新科技署提交的進度報告也便於查考項目的進展以及達標程度。董事局的技術委員會並會於每季審核各項目，而應科院的首席科技總監會監察各項目每月的進度。

應科院管理層著重透過提升專利質素來增加收入，採用多個合理指標以評估研發成果的成績，其中包括申請專利數目、成功獲批專利比率及專利授權收入等。而所有申請中或已獲批專利的商品化情況，也會每六個月向技術委員會呈報。

Corporate Governance

ASTRI is headed by a Chief Executive Officer and is governed by a Board of Directors which is responsible for policy and strategic directions. Directors are appointed from the industrial and commercial sectors, the academia and the HKSAR Government to assist the Board in managing ASTRI.

Three functional committees, namely Finance and Administration Committee (FAC), Technology Committee (TC) and Audit Committee (AC), assist the Board in managing ASTRI. FAC oversees ASTRI's financial and administrative matters; TC oversees research initiatives; and AC ensures both internal and external audit processes are properly carried out.

To assure management quality, ASTRI compiled a Board-approved Corporate Governance Manual. On the whole, the four key objectives of ASTRI's management system are Transparency, Speed, User-friendliness and Governance.

In past years, sections of the Corporate Governance Manual were updated and modified taking into account changes and developments required for improving ASTRI's operation, as well as responding flexibly to and reflecting on the changing terms and conditions of the business environment in which ASTRI operates.

企業管治

應科院以行政總裁為首，並由董事局管治；董事局負責製訂應科院的政策和策略方向，成員來自工商界、學術界及香港特區政府，由委任產生，協助董事局管理應科院。

董事局設有三個功能委員會，分別為財務與行政委員會、技術委員會及審計委員會，以協助董事局管理應科院各項事務。財務與行政委員會監督應科院財務及行政事宜，科技委員會監督應科院的研究項目，審計委員會則確保內部及外部審計程序被適當地執行。

為確保管理質素，應科院已制定經董事局批准的企業管治手冊。應科院管理系統的四大指標為透明度、速率、簡易程度和管治。

過去數年間，企業管治手冊中多個段落已告更新和改動，把對改善應科院運作模式所必要的轉變和發展納入考慮範圍，及以業界的需要為重點，對應科院所處的營運環境的轉變作靈活的應對和考量。

Reiterating the total commitment of both the Board and management in upholding the highest level of integrity in ASTRI business practices and staff ethical standards, a special section in the latest version was dedicated to "Code of Ethical and Professional Conduct".

The manual also clearly defined policies and guidelines regarding "Financial Management of ASTRI's Recurrent Subvention" and "Procurement of Goods and Services". The guidelines spelt out the latest revisions on delegating authority to senior management regarding financial matters such as approving expenditures and purchase orders, signing cheques, and writing off bad debts, inventory and other valuables, etc.

In addition, the manual also included sections on "IP Portfolio Management", "Technology Transfer" and "R&D Project Management and Process", providing the latest policies and guidelines in these important areas.

Furthermore, to efficiently exercise good corporate governance, an Internal Audit Department under the Audit Committee was set up in 2007 to assist the Board by providing it information and assurance on internal management controls.

Under the manual, the Internal Audit Department is required to carry out annual audits to meet coverage requirements specified by the Board in accordance with determined priorities. The department is also required to review efficiency and effectiveness of the internal control system and report to the Board via the Audit Committee. With respect to these requirements, biannual Internal Audit Progress Reports are presented to the Audit Committee.

In April 2007, the Board appointed the Head of Internal Audit as the Compliance Officer to assist its governance by providing timely information to the Audit Committee on the compliance status of ASTRI regarding policy and procedures of project management, finance, human resources and administrative management.

To ensure continuous compliance with the Guide to Information and Technology Support Programme (ITSP), ASTRI's corporate governance policy, operational procedures and other relevant guidelines, the Compliance Officer is required to submit quarterly reports to the Audit Committee.

董事局及管理層要求應科院的商業操作廉正不阿，員工保持最高的道德操守，為重申這不二承諾，最新修訂版中特闢一欄「道德及專業行為守則」。

有關「應科院經常性撥款的財務管理」以及「貨品與服務購置」的政策和指引亦清楚寫明；此兩段下各欄目闡述了在諸如批核支出和訂購、簽發支票，及報廢呆帳、存貨及其他貴重物品等財政事務上，授權予高層管理人員的最新修訂。

此外，手冊也加入了新欄目「知識產權組合管理」、「技術轉移」以及「研發項目管理及流程」，提供這些重要範疇的最新政策和指引。

另外，為有效進行良好的企業管治，應科院於二零零七年成立內部審計部門，隸屬於審計委員會，協助董事局，向其提供有關內部管理控制的資訊及保證。

內部審計部門每年應根據確定的優先次序進行審計，以達到董事局對審計範圍的要求。內部審計部門並負責審核內部控制制度的效率和有效性，透過審計委員會向董事局報告。為此，內部審計部門每半年向審計委員會提交內部審計進度報告。

二零零七年四月，董事局委任內部審計主管擔任合規主任，協助進行企業管治，適時向審計委員會提供有關應科院遵守項目管理、財務、人力資源及行政管理政策和程序的情況。

為確保應科院持續遵守《資訊及科技支援計劃指引》、企業管治手冊、ISO程序及其他相關指引，合規主任必須每季度向審計委員會提交報告。

Performance
業績

A very critical part of ASTRI's customer-focused R&D practices is the rigorous setting and monitoring of quantitative performance targets. The targets are used as essential basis for appraising performances of R&D groups and their leaders. The three main types of quantitative performance targets adopted are:

- Number of technologies transferred to industry per year - this is most crucial as they are the "path" towards commercializing IPs developed by R&D projects;
- Number of patent applications filed per year as well as the number of patents granted and their success ratio - this is important because patents are essential indicators of the worthiness of innovations and are used to increase the value of technology transfer activities; and
- Income from industry per year -- as ASTRI continues to engage customers and build a valuable brand name for its customer base, the eventual income from this base through services such as licensing and technology sales, design and product development, will increase.

During the year, ASTRI managed to achieve satisfactory progress in most of its target areas. Although the number of technology transfers dropped slightly, income from industry increased substantially. This is mainly due to ASTRI's new strategy of focusing more on project quality instead of quantity.

There are mainly four types of projects undertaken by ASTRI:

- Innovation and Technology Fund (ITF) funded platform projects;
- ITF funded seed projects;
- Industry Collaborative Projects in which both ASTRI and industry partners contribute fund and other resources; and
- Contract research projects which are customized R&D projects in accordance with industry partner's request. Partner is responsible for 100 per cent of R&D project costs. The number of contract research projects undertaken during the year was 77.

The following table shows the number of three major types of projects undertaken by ASTRI in the last three years:

應科院為其業績設立嚴謹的可量化目標，成為其以顧客為導向的研發工作中重要的一環。這些目標會用作對應科院的研發團隊及其負責人進行年度工作評審的主要基準。應科院採納的三大可量化工作目標如下：

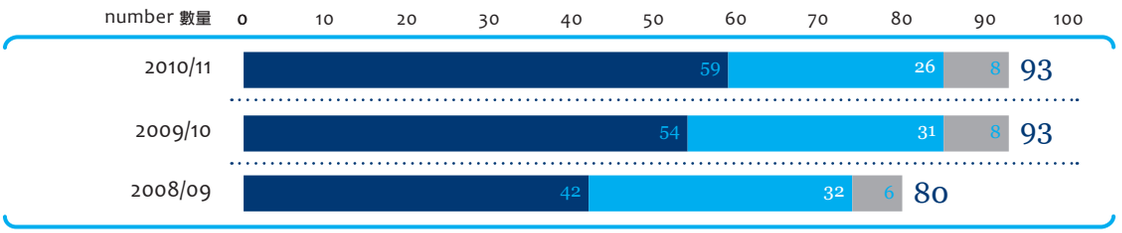
- 每年轉移至業界的技術數目：由於這是研發項目所開發的知識產權轉至商業化發展的「門徑」，所以至為重要；
- 每年申請和取得的專利數目及其成功率：專利是評估所研發的技術是否有價值的主要指針，並可增加技術轉移活動的價值，因此十分重要；及
- 每年從業界所得的收入：隨著應科院繼續爭取顧客並在顧客心目中建立有價值的品牌，透過各種服務，如授權協議、技術轉售、定制設計、產品開發等，自顧客取得的最終收入將會增加。

年度內，應科院在各個工作目標均取得令人滿意的進展。雖然技術轉移數目有些微下降，但從業界獲得的收入則有顯著增加，主要原因是應科院採取了以質代量的新策略。

應科院的研發項目種類主要有四種：

- 創新及科技基金資助平台項目；
- 創新及科技基金資助種子項目；
- 由業界夥伴及應科院共同投入資金及其他資源的業界合作項目；
- 按業界夥伴個別需求而定制的合約研究項目，業界夥伴須負責全部研發成本。本年度應科院承辦的合約研究項目共77項。

下表展示過去三年應科院進行的三類主要研發項目的數量，



Undertaken
承辦
93
R&D projects
個研發項目

- ITF-funded Platform Projects 創新及科技基金資助平台項目
- ITF-funded Seed Projects 創新及科技基金資助種子項目
- Industry Collaborative Projects 業界合作項目

Technology Transfers

The number of technology transfers to industry was 75 in 2010/11. The breakdown by R&D groups for the past three years is tabulated below:

技術轉移

二零一零／一一年應科院向業界轉移的技術數量共有七十五項。各研發群組過去三年向業界轉移的技術數量表列如下：

R&D Group	研發群組	2008/09	2009/10	2010/11
Communications Technologies	通訊技術	42	34	18
Enterprise & Consumer Electronics	企業與消費電子	15	19	18
IC Design	集成電路設計	12.5	7	11
Material & Packaging Technologies	材料與構裝技術	19.5	40	28
Bio-Medical Electronics (Team)	生物醫學電子（組）	N.A. / 不適用	0	0
Total	**總數**	**89**	**100**	**75**

The following table illustrates the number of technology transfers to industry by various channels during the past three years:

下表列出過去三年通過各種途徑向業界轉移技術的數目：

Channels	途徑	2008/09	2009/10	2010/11
Industry Collaborative Project agreements signed	已簽訂的業界合作項目合約	8	1	2
Contract research project agreements signed	已簽訂的合約研究項目合約	57	69	41
Licensing agreements signed	已簽訂的授權協議	24	30	32
Total	**總數**	**89**	**100**	**75**

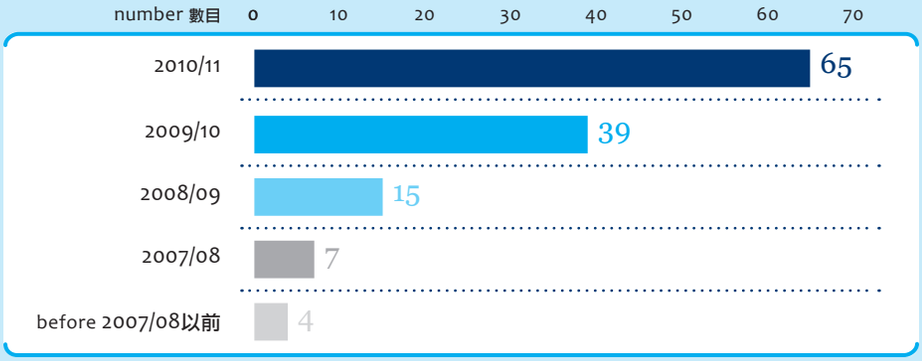
Patents

As at 31 March, 2011, ASTRI was granted 130 patents for technologies developed. The following table shows the number of patents granted in past years.

專利

截至二零一一年三月三十一日止，應科院所研發的技術共取得一百三十項專利。下表展示過去財政年度獲批的專利數目：

65
patents granted
項專利獲批



Inome from Industry

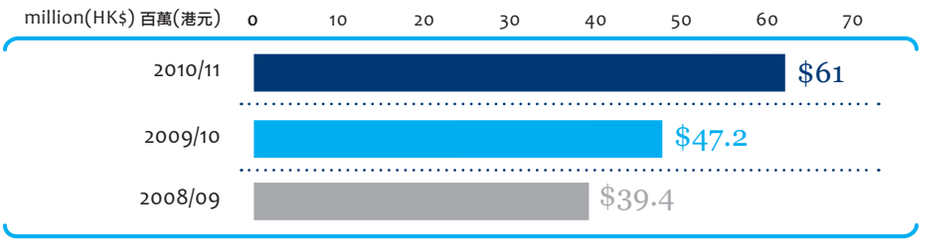
During the year, income from industry received from all projects amounted to HK$61 million[1], with the level of contribution[2] at 20.3 per cent. The following table shows the increase in income from industry in the past three years.

業界收入

是年度從所有項目已收取的業界收入[1]總額為六千一百萬港元，投入資金水平[2]為百分之二十點三。下表顯示過去三年業界收入的增長。

[1] Including cash and in-kind contribution
包括現金及物資資助

[2] Percentage of industry income received over total R&D project spending
從業界所得收入佔總研發項目支出的百分比



The table below compares income from industry received by R&D groups in the past three years.

下表把過去三個財政年度各研發群組所獲得的業界收入作一比較。

R&D Group	研發群組	2008/09	2009/10	2010/11
Communications Technologies	通訊技術	15.7	13.9	20
Enterprise & Consumer Electronics	企業與消費電子	12.3	11.9	15.9
IC Design	集成電路設計	2.6	8.8	10.6
Material & Packaging Technologies	材料與構裝技術	8.6	10.2	14.7
Bio-Medical Electronics (Team)	生物醫學電子（組）	N.A. / 不適用	2.4	(0.2)
Others	其他	0.2	N.A. / 不適用	N.A. / 不適用
Total	**總數**	**39.4**	**47.2**	**61**

A total of 87 patent applications were filed on the Mainland, U.S. and other countries in 2010/11. From 2006/07 to 2010/11, ASTRI filed more than 550 patent applications for new inventions. The following table shows the number of applications filed by R&D groups in the past three years:

在二零一零／一一年，應科院在中國內地、美國及其他國家共作出八十七項專利申請。從二零零六／零七年至二零一零／一一年，應科院已為新發明申請超過五百五十項專利。下表列出過去三年各研發群組申請的專利數目：

R&D Group	研發群組	2008/09	2009/10	2010/11
Communications Technologies	通訊技術	29	14	7
Enterprise & Consumer Electronics	企業與消費電子	23	26	16
IC Design	集成電路設計	12	11	10
Material & Packaging Technologies	材料與構裝技術	75	64	52
Bio-Medical Electronics (Team)	生物醫學電子（組）	N.A. / 不適用	4	2
Total	**總數**	**139**	**119**	**87**

Successful Commercialization

During the year, 64 companies were engaged in 75 technology transfers with ASTRI through licensing, contract research and other means, resulting in many successful commercialization cases. The following are cases worth noting:

» A US$2 million contract was signed licensing ASTRI's compact anti-shaking technologies for camera phones involving eight patents to AP Photonics Limited (APP), a newly established Hong Kong-based company tapping the global camera phone market. Agreements between APP and major international mobile phone manufacturers in wielding ASTRI's anti-shaking module in next generation camera phones are either being signed or under negotiation. It is expected camera phones powered by ASTRI technologies will be hitting the global consumer market in the first quarter of 2012.

» The patent-protected "birdcage" housing structure facilitating heat dissipation of the MR16 LED lamps was licensed to Optiled Lighting International Ltd., a Hong Kong-based enterprise, to develop its Super Star LED lighting product series. The products were launched into the market in August 2010 and are now available in more than 400 outlets worldwide.

» MyID, the first generation e-learning device developed by ASTRI, was put on trial use in more than 30 local schools and was well received by students and teachers. MyID was also available for purchase in Commercial Press bookshops. The second generation ASTRI home-grown e-learning device PAL was in mass production by March 2011.

應科院技術成功商品化

在二零一零／一一年，應科院藉技術授權、合約研究及其他途徑作出了七十五項技術轉移，涉及六十四間公司，成功商品化的個案繁多，以下是一些重要例子：

» 應科院與本地新成立的愛佩儀光電技術有限公司（愛佩儀）簽訂二百萬美元的合約，將手機相機微型防震模組的有關八項專利授權給愛佩儀開發新一代相機手機，以進軍全球手機市場。愛佩儀已就有關防震模組技術，與一些國際主要手機生產商簽訂協議或進行洽商。預期該款應用應科院技術的相機手機將於二零一二年首季在全球熱賣。

» 應科院把其專利項目「鳥籠」散熱技術授權予一家香港企業 — 奧的亮照明國際有限公司，用來開發其Super Star LED照明系列。該產品於二零一零年八月面市，現時已在全球超過四百家商戶有售。

Received income from industry
從業界所得收入
$61
million (HK$)
百萬(港元)

Completed
完成
75
technology transfers
項技術轉移

ASTRI CEO Dr. Cheung (left) with Mr. Chen Yaping, General Manager of RM Technology Co. Ltd. at the contract signing ceremony
應科院行政總裁張博士（左）與成都雷電微力科技有限公司總經理陳亞平先生於簽約儀式上合攝

Compact anti-shaking camera module
微型相機防震模組

» ASTRI signed an ICP agreement with Velosti of Silicon Valley to co-develop a USB 3.0 chip. To exploit the rapidly expanding market, the collaboration calls for ASTRI to do most of the design work while Velosti's headquarters in the United States prepares production.

» ASTRI signed a five-year contract with RM Technology Co. Ltd. from Chengdu to co-develop two high-speed data processing integrated circuit modules, which are aimed to be deployed in the communication system of China's high-speed trains in the next two to three years.

» The world's first TD-LTE (pre-4G technology) terminal baseband SoC chip jointly developed by ASTRI and its industry partner Innofidei was used in the TD-LTE showcase network set up by China Mobile at the World Expo in Shanghai. The network provided coverage in major areas of the expo site, up to as far as the Huangpu River area, enabling visitors to experience mobile HD video conferencing and streaming, as well as other Internet browsing applications at an exceptionally high-speed of 70 Mbit/s.

» ASTRI actively responded to the "Promotion of Innovation and Technology in the Public Sector" initiated by the Innovation and Technology Commission to promote application of home-grown technologies by Government and public bodies. It is undertaking many innovative projects with different Government agencies under the programme which include:

- LED Lighting with the Highways Department, Electrical and Mechanical Services Department, and Housing Department
  與路政署、機電工程署及房屋署合作安裝LED照明
- E-books with the Education Bureau
  與教育局合作推行電子書
- Mobile surveillance system with the Hong Kong Police Force
  為警隊提供流動監測技術

» **由應科院開發的第一代電子學習器MyID已於全港超過三十間中小學校進行試用，並廣受學生和教師歡迎。MyID亦已在商務印書館有售。應科院院內研發的第二代電子學習器「易學夥伴」亦已於二零一一年三月進行量產。**

» **應科院與矽谷的Velosti簽訂一項「業界合作項目」協議，合作發展 USB 3.0 晶片。為了進佔快速膨脹的市場，該項目大部份的設計工序將由應科院完成，而Velosti的美國總部則負責籌劃生產。**

» **應科院與成都雷電微力科技有限公司簽訂為期五年的合約，合作研發兩套高速資料處理集成電路模組，期望在未來兩三年內能用於中國高速鐵路的無線通訊系統。**

» **由應科院和創毅視訊合作研發的全球第一塊TD-LTE（準第四代流動通訊技術）終端基帶晶片獲中國移動應用在上海世界博覽會內建設的TD-LTE試驗網絡中。該網絡的覆蓋範圍包括幾個主要場館及黃埔江水面，讓遊人可以每秒70Mbit之速度體驗移動高清視象會議、高清現場直播及其他高速互聯網應用服務。**

» **應科院積極參與由創新科技署牽頭的「在公共機構應用創新科技」計劃，將本院開發的先進技術應用在政府或公共機構。現時正進行的創新項目包括：**

Awards and Accolades

During the year, ASTRI's innovative technologies received prestigious awards illustrating our R&D efforts were well recognized by industry and the community at large.

獎項與榮譽

年內，應科院的創新技術獲得多個獎項，顯示出應科院的研發工作大受業界和社會認同。

The all-in-one HD set-top box NOVA jointly developed by ECE Group and its partner, Eight Limited, won the Most Innovative Award in the 2010 Hi-Tech King Contest organized by Hi-Tech Weekly. This is the third major award won by the product since it was launched in 2009.*	由企業與消費電子群組及業界合作夥伴Eight Limited合作研發的多功能高清錄機頂盒NOVA奪得由《數碼誌尚》雜誌舉辦的「2010 Hi-Tech 王大賞」中的「最具創意產品大賞」，這是該項產品於二零零九年推出後獲得的第三個重要殊榮。*
An advanced conference phone jointly developed by Li-Creative Technologies, Inc. and ECE Group won the Innovations 2011 Design and Engineering Showcase Award (Audio Accessories) during the International CES held in Les Vegas in 2011.*	Li-Creative Technologies, Inc. 和企業與消費電子群組合作開發的一款先進會議電話在拉斯維加斯舉行的2011年國際消費電子展中，榮獲「2011年設計與工程創新獎（音響配件）」。*
The method of removing sapphire substrate by chemical mechanical polishing technology developed by MPT Group won the Product Innovation Award in the Nanhai Cup National Solid State Lighting (SSL) Contest in China.	材料與構裝技術群組開發的化學機械拋光藍寶石襯底剝離技術在「南海杯國家半導體照明創新大賽」中獲頒「產品創新獎」。
Dual-mode 3D pico-projector, another technology developed by MPT Group, won the Product Innovation Award in the Nanhai Cup National Solid State Lighting (SSL) Contest in China.	另一個由材料與構裝技術群組開發的雙模式3D微型投影儀先導技術亦於「南海杯國家半導體照明創新大賽」奪得「產品創新獎」。
MPT Group also obtained the Progressive Product Award in the Nanhai Cup National Solid State Lighting (SSL) Contest with the ultra-thin double-sided LCD display technology it developed.	材料與構裝技術群組在「南海杯國家半導體照明創新大賽」中還憑藉其開發的超薄型雙面公共資訊顯示器技術贏得了「進取獎」。

* Award received by client with technology licensed from ASTRI
獎項由採用應科院授權技術的客戶獲得

Technology Roadmap

ASTRI's R&D projects are formulated with a view to building and strengthening the institute's technical competence or platform technologies that continuously spawn a multitude of future applications. When these combinations are well-planned and executed, the competence and applications would feed off each other and achieve best results.

技術路線圖

應科院精心策劃研發項目，以建構和不斷加強技術能力或平台技術，持續地開發大量未來的應用科技。這些組合若能周全計劃，妥善執行，研發能力和應用項目便能相輔相承，獲得最佳成果。

Enterprise & Consumer Electronics 企業與消費電子

Digital Home Technology 數碼家庭技術
Mobile Multimedia Communications Technology 移動多媒體通訊技術
Multimedia Technology IP 多媒體技術知識產權
Pervasive Service Technology 普及服務技術
Smart Sensor Computing Technology 智慧感測器計算技術

Communications Technologies 通訊技術

4G/LTE Technology 4G/LTE 技術
Communication Software 通訊軟件
Antenna and Digital RF 天線與數碼射頻
Digital and RFIC Design 數碼與射頻晶片設計

IC Design 集成電路設計

Power Management ICs 電源管理 IC
Analog and Mixed Signal ICs 類比及混合訊號 IC
System on Chip 系統級晶片

Material & Packaging Technologies 材料與構裝技術

Display Systems 顯示系統
LED Lighting LED 照明
Advanced Packaging Technologies 先進構裝技術
Photonic Components 光電子元件
Device and Energy 器件與能源

Bio-Medical Electronics 生物醫學電子

Head Mount Display for Medical Use 醫療專用頭戴式顯示器
Digital Pathology 數碼病理學
Tele-healthcare 遠程醫療
Screening and Early Diagnosis 篩檢和早期診斷

People
人才匯聚

Sparks of Wisdom Enlighten People

智慧　啟迪研發專才

Board of Directors
董事局

As at 31 March, 2011
截至二零一一年三月三十一日

In alphabetical order of surnames
以英文姓氏順序排列

Chairman 主席

Dr. Patrick Wang Shui-chung, SBS, JP [1]
汪穗中博士，SBS ， JP

Members 董事

Mr. Anthony Au Wai-hung, BBS [2]
區煒洪先生，BBS

Dr. Sunny Chai Ngai-chiu [3]
查毅超博士

Prof. Andrew Chan Chi-fai, SBS, JP [4]
陳志輝教授 ，SBS ，JP

Prof. Philip Chan Ching-ho [5]
陳正豪教授

Prof. Chew Weng-cho [6]
周永祖教授

Mr. George Hongchoy Kwok-lung [7]
王國龍先生

Dr. Patrick Lam See-pong [8]
林師龐博士

Mr. Henry Leung Kwong-han
梁廣恆先生

Dr. Humphrey Leung Kwong-wai [9]
梁廣偉博士

Ms. Agnes Nardi Kar-wai [10]
李家慧女士

Mr. Victor Ng Kwok-ho [11]
吳國豪先生

Mr. Richard Sun Po-yuen [12]
孫寶源先生

Mr. Peter Wong King-fai
黃景輝先生

Mr. Luther Wong Lok-tak [13]
王樂得先生

Official Members 官守董事

Miss Elizabeth Tse Man-yee, JP, Permanent Secretary for Commerce and Economic Development (Communications and Technology) [14]
謝曼怡女士，JP，商務及經濟發展局常任秘書長（通訊及科技）

Miss Janet Wong Wing-chen, JP, Commissioner for Innovation and Technology [15]
王榮珍女士，JP，創新科技署署長

ASTRI is governed by a Board of Directors comprising representatives from the industrial and commercial sectors, the academia and the HKSAR Government. Directors are appointed by the Government and have collective responsibility for ASTRI's leadership, policy and strategic directions.

Members of Functional Committees

Directors also served as members of the three functional committees, namely Finance and Administration Committee, Technology Committee and Audit Committee, assisting the Board in managing ASTRI. Below are the committee memberships.

應科院由董事局治理，董事局成員包括來自工商界、學界及香港特區政府的代表。董事由特區政府委任。他們負責集體領導應科院，制訂政策和戰略發展方向。

功能委員會成員

董事也擔任三個功能委員會，即財務與行政委員會、技術委員會及審計委員會的成員。功能委員會協助董事局管理應科院的業務。以下是該些委員會的成員名單。

Finance and Administration Committee
財務與行政委員會

- Mr. Henry Leung Kwong-han (Chairman) 梁廣恆先生 (主席)
- Mr. Anthony Au Wai-hung, BBS 區煒洪先生，BBS
- Ms. Agnes Nardi Kar-wai 李家慧女士
- Mr. Luther Wong Lok-tak 王樂得先生
- Miss Janet Wong Wing-chen, JP 王榮珍女士，JP

Audit Committee
審計委員會

- Mr. Richard Sun Po-yuen (Chairman) 孫寶源先生（主席）
- Dr. Sunny Chai Ngai-chiu 查毅超博士
- Mr. George Hongchoy Kwok-lung 王國龍先生
- Mr. Victor Ng Kwok-ho 吳國豪先生
- Miss Janet Wong Wing-chen, JP 王榮珍女士，JP

Technology Committee
技術委員會

- Prof. Philip Chan Ching-ho (Chairman) 陳正豪教授（主席）
- Mr. Anthony Au Wai-hung, BBS 區煒洪先生，BBS
- Dr. Sunny Chai Ngai-chiu 查毅超博士
- Prof. Chew Weng-cho 周永祖教授
- Dr. Patrick Lam See-pong 林師龐博士
- Mr. Henry Leung Kwong-han 梁廣恆先生
- Dr. Humphrey Leung Kwong-wai 梁廣偉博士
- Ms. Agnes Nardi Kar-wai 李家慧女士
- Mr. Victor Ng Kwok-ho 吳國豪先生
- Mr. Peter Wong King-fai 黃景輝先生
- Miss Janet Wong Wing-chen, JP 王榮珍女士，JP

Movements of Directors 董事局成員變動

New Directors 新委任董事	Appointed Date 委任日期
Prof. Andrew Chan Chi-fai, SBS, JP 陳志輝教授 ，SBS，JP	21 October, 2010 二零一零年十月二十一日
Mr. George Hongchoy Kwok-lung 王國龍先生	21 October, 2010 二零一零年十月二十一日
Ms. Agnes Nardi Kar-wai 李家慧女士	21 October, 2010 二零一零年十月二十一日
Miss Elizabeth Tse Man-yee, JP (Official) 謝曼怡女士，JP（官守）	26 April, 2010 二零一零年四月二十六日
Retired Directors 退任董事	**Date of Retirement 退任日期**
Dr. Jacqueline Lui Chiu-tong 呂許昭棠博士	20 October, 2010 二零一零年十月二十日
Mr. Duncan W. Pescod, JP (Official) 柏志高先生，JP（官守）	26 April, 2010 二零一零年四月二十六日
Prof. Vincent Y. Shen 沈運申教授	20 October, 2010 二零一零年十月二十日
Mr. Ben Wong Chung-mat, MH 王忠秣先生，MH	20 October, 2010 二零一零年十月二十日
Alternate Directors 替代董事	**Appointment Status 委任狀況**
Miss Janet Wong Wing-chen, JP (Official) 王榮珍女士，JP（官守）	Retired on 26 April, 2010 as alternate to Mr. Duncan W. Pescod, JP; 二零一零年四月二十六日退任替代柏志高先生，JP Appointed on 26 April, 2010 as alternate to Miss Elizabeth Tse Man-yee, JP 二零一零年四月二十六日獲委任替代謝曼怡女士， JP

A Growing Workforce
茁壯的人力資源

ASTRI sees its people as the most precious asset and it devotes considerable time and resources to attracting the right people from the world and building them into an outstanding team of professionals. The following is the profile of ASTRI's people in the year under review.

應科院視人才為寶貴資產，一直致力投放大量資源吸納各地人才，並培育他們成為應科院的專業團隊。下列是應科院過去一年的人力資源分佈情況。

Headcount Status

As at 31 March, 2011, ASTRI has 585 employees with 87 per cent of them involved in R&D. The total number of staff has increased by three per cent.

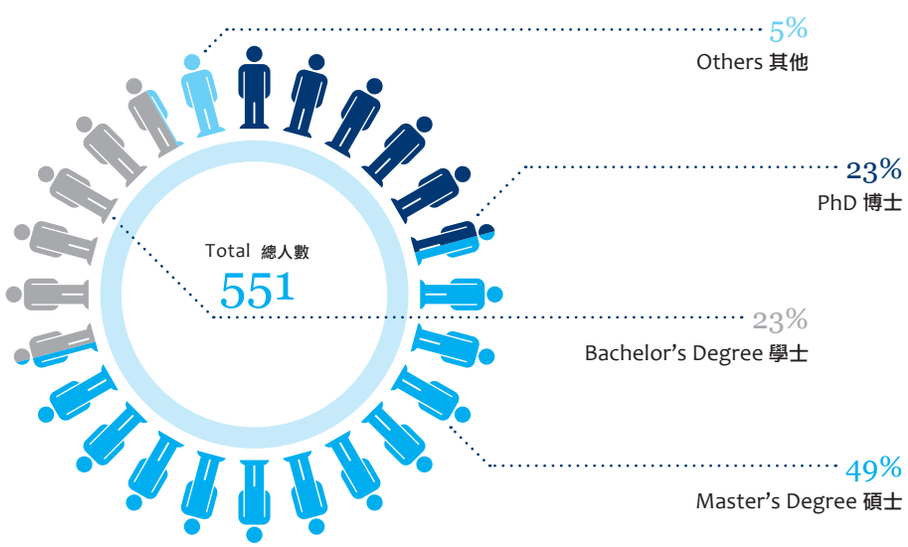
員工人數

截至二零一一年三月三十一日，應科院員工總數為五百八十五人，當中百分之八十七為研發人員。全體員工人數增加了百分之三。

		As at 31 March, 2010 截至二零一零年三月三十一日	As at 31 March, 2011 截至二零一一年三月三十一日
Headquarters	**總部**	**76**	**77**
R&D Group	**研發群組**		
» Communications Technologies	» 通訊技術	134	133
» Enterprise & Consumer Electronics	» 企業與消費電子	114	125
» IC Design	» 集成電路設計	83	86
» Material & Packaging Technologies	» 材料與構裝技術	104	118
» Bio-Medical Electronics (Team)	» 生物醫學電子（組）	9	12
» Interns	» 實習研究員	47	34
» Sub-total	» 小計	491	508
Total	**總數**	**567**	**585**

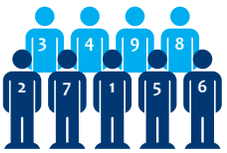
Academic Qualification of ASTRI Staff 員工學歷

(As at 31 March, 2011 截至二零一一年三月三十一日)



Including R&D and non-R&D staff, not including interns
包括研發人員、非研發人員，但不包括實習研究員

Senior Executives
高級行政人員



As at 31 March, 2011
截至二零一一年三月三十一日

Chief Executive Officer 行政總裁

Dr. Cheung Nim-kwan [1]
張念坤博士

Headquarters 總部

Prof. Peter Yum, Chief Technology Officer
首席科技總監 任德盛教授

Ms. Betty Law, Chief Financial Officer [2]
首席財務總監 羅翠萍女士

Mr. David Poon, Vice President, Corporate Communications and Company Secretary [3]
副總裁(傳訊)及公司秘書 潘占達先生

Ms. Monisa Wan, Human Resources Director [4]
人力資源總監 溫小雯女士

R&D Groups 研發群組

Dr. Chao Shen-chang, Vice President and Group Director, Enterprise & Consumer Electronics Group [5]
企業與消費電子群組 副總裁及研發群組總監 趙盛章博士

Dr. Wang Keh-chung, Vice President and Group Director, IC Design Group [6]
集成電路設計群組 副總裁及研發群組總監 王克中博士

Dr. Wu Enboa, Vice President and Group Director, Material & Packaging Technologies Group [7]
材料與構裝技術群組 副總裁及研發群組總監 吳恩柏博士

Dr. Henry Ye, Acting Vice President and Group Director, Communications Technologies Group [8]
通訊技術群組 署理副總裁及研發群組總監 葉暉博士

Dr. Francis Lee, Acting R&D Director, Bio-Medical Electronics Team [9]
生物醫學電子組 署理研發總監 李致淳博士

Annual Remuneration of ASTRI Senior Executives 應科院高級行政人員薪酬

Post 職級	Annual Remuneration 1 April, 2010 - 31 March, 2011 (HK$M) 由二零一零年四月一日至二零一一年三月三十一日全年薪酬（百萬港元）
Chief Executive Officer 行政總裁	3.6
Five Level One Executives 五名一級員工	10.8
20 Level Two Executives 二十名二級員工	24.5

Annual Remuneration 1 April, 2010 - 31 March, 2011 (HK$) 由二零一零年四月一日至二零一一年三月三十一日全年薪酬（港元）	Number of Senior Executives 高級行政人員數目
1,000,000 or below 或以下	5
1,000,001 – 1,500,000	11
1,500,001 – 2,000,000	6
2,000,001 – 2,500,000	3
2,500,001 – 3,000,000	0
3,000,001 – 3,500,000	0
3,500,001 – 4,000,000	1

Honours for Staff
員工的榮譽

ASTRI firmly believes that it takes the combined efforts and dedication of every member of the ASTRI community to lead it to further progress and success. ASTRI also takes immense pride in the success and contributions of its staff.

應科院深信，院內每一位成員的努力及付出是應科院得以不斷進步及屢創佳績的關鍵。應科院對於員工的成就及所作的貢獻感到無比自豪。

2011 LED Expert Award
二零一一年LED照亮中國專家學者獎

Dr. Wu Enboa, Vice President and Group Director, was bestowed "LED Expert Award" by GG-LED.com, an authoritative online platform promoting the LED industry in China, for his sustained and outstanding contribution to the development of the LED industry. Dr. Wu won this award through two rounds of polling by professionals in the industry on the Mainland, Hong Kong, Macau and Taiwan.

副總裁及研發群組總監吳恩柏博士在中國LED業界權威網上平台「高工LED」主辦的「2010 LED照亮中國」評選活動中，因其對促進LED產業發展所作的貢獻而獲頒「專家學者獎」。此獎項得獎者是經由全國各地（包括港、澳、台）業界人士分兩輪投票選出。

Product Innovation Award, Nanhai Cup National Solid State Lighting (SSL) Contest 2010
二零一零年中國「南海杯國家半導體照明創新大賽」產品創新獎

ASTRI won this award with the technology of removing sapphire substrate by chemical mechanical polishing (CMP). Removing the substrate is a necessary process for fabricating the vertical LED device. The novel CMP approach replaced the typical laser lift-off process for removing the substrate, resulting in a better process yield in terms of reverse current specification. By 2010, ASTRI has filed eight patent applications in the U.S. for this unique process.

應科院憑藉其開發的去除藍寶石襯底的化學機械拋光技術（CMP）榮獲此獎項。在垂直結構LED器件製造過程中，去除藍寶石襯底是一必要環節；應科院開發出獨有的CMP，成功取代了常用的激光剝離技術，不但可以除去藍寶石襯底，而且以逆向電流為指標可以提高生產良率。直至二零一零年，應科院已就該技術在美國申請了八項專利。

Winning Team 獲獎團隊

Dr. Lin Limin, Project Manager, Device Design and Process Integration
林立旻博士，項目經理，負責器件設計及製程整合

Mr. Chu Hung-shen, Manager, Key Patent Owner
褚宏深先生，經理，關鍵專利發明人

Mr. Joe Chan Ka-wah, Senior Engineer, Chemical Mechanical Polish Process
陳家華先生，高級工程師，負責化學機械拋光製程

Ms. Zheng Shengmei, Engineer, Device Front-end Process
鄭盛梅女士，工程師，負責器件前段製程

Progressive Product Award, Nanhai Cup National Solid State Lighting (SSL) Contest 2010
二零一零年中國「南海杯國家半導體照明創新大賽 」 進取獎

ASTRI won this award with the ultra-thin double-sided LCD display, which is powered by a single side-emitting LED backlight light source with LEDs implanted at the edges of the Light Guide Plate of the display embodiment. While the slim backlight module design offers convenience and saves space in display application, the double-sided display technology enables easy access and efficient dissemination of information to the public.

應科院的超薄型雙面顯示器技術獲此獎項。該技術利用創新設計的單一背光源朝雙面發光，配合超薄的背光模組設計，既可節省空間，使用時更加方便。這個新穎的雙面顯示器技術，為公共信息顯示器提供了更方便和有效的顯示平台。

Winning Team 獲獎團隊

Ms. Anna Liu Ying, Project Manager, Optical System Design, Simulation and Integration
劉穎女士，項目經理，負責光學系統的設計、模擬和整合

Mr. Alex Cheung Yuk-lung, Senior Engineer, Electrical System Design and Integration
張玉龍先生，高級工程師，負責電子系統設計和整合

Mr. Zhang Yihong, Engineer, Thermal System and Mechanical Design
張鈺洪先生，工程師，負責熱力系統及機械設計

Product Innovation Award, Nanhai Cup National Solid State Lighting (SSL) Contest 2010
二零一零年中國「南海杯國家半導體照明創新大賽 」 產品創新獎

ASTRI developed the world's first dual-mode 3D pico-projector allowing switching between 2D and 3D images. The integrated design features an ultra-compact pico-projector which can project 3D images with high brightness, high contrast and high resolution anytime, anywhere.

應科院開發的全球第一台雙模式三維微型投影模組可兼容二維及三維影像顯示，整合的終端產品投影儀只有手掌大小，用者可以隨時隨地輕鬆欣賞高亮度、高對比度及高解析度的三維影像。

Winning Team 獲獎團隊

Ms. Anna Liu Ying, Project Manager, Project Proposal and Execution, Optical System Design, Simulation and Integration
劉穎女士，項目經理，負責項目籌劃及執行、光學系統的設計、模擬和整合

Mr. Alex Cheung Hon-lung, Senior Engineer, Display-related Hardware and Firmware Development, Coding and System Driving
張瀚龍先生，高級工程師，負責顯示系統硬體及韌體設計及系統驅動

Dr. Chi Yong, Senior Engineer, LED Pico-projector Mechanical Structure Design, Thermal Optimization and Prototyping
池勇博士，高級工程師，負責LED微型投影技術中的散熱分析與機構設計、樣機製備和優化

Mr. Tang Weiping, Engineer, Illumination System and Projection System Design of Projector, Optical Engine System Optimizing and Prototyping
湯偉平先生，工程師，負責投影儀光學引擎的照明和成像系統的設計、樣機製備和優化

External Appointments
外界任命

Dr. Cheung Nim-kwan, Chief Executive Officer 行政總裁 張念坤博士	
» Member of Board of Directors, Institute of Electrical and Electronics Engineers (IEEE)	» 國際電機電子工程師學會董事局成員
» Member, Research Grants Council, Education Bureau of HKSAR	» 香港特區政府教育局研究資助局委員
» Honorary Professor, Faculty of Engineering, The Chinese University of Hong Kong	» 香港中文大學工程學院榮譽教授
» Member, Management Board of the Institute of Network Coding, The Chinese University of Hong Kong	» 香港中文大學網絡編碼研究所管理委員會委員
» Member, Advisory Committee, Department of Computing, The Hong Kong Polytechnic University	» 香港理工大學電子計算學系諮詢委員會委員
» Member, Electronics/ Electrical Appliances Industries Advisory Committee, Hong Kong Trade Development Council	» 香港貿易發展局電子及電器產品業諮詢委員會委員
» Honorary Adviser, PRAGMA 20 (Pacific Rim Application and Grid Middleware Assembly) cum The University of Hong Kong Centennial IT Conference, The University of Hong Kong	» 香港大學環太平洋網格應用與中間件聯盟第二十次工作組會議暨香港大學百周年科技大會榮譽顧問
» Member, Programme Committee, Hong Kong Computer Society	» 香港電腦學會課程委員會委員
Prof. Peter Yum, Chief Technology Officer 首席科技總監 任德盛教授	
» Member, Appeal Tribunal Panel, Building Ordinance (Cap.123), Planning and Lands Branch, Development Bureau, Government Secretariat, HKSAR	» 香港特區政府總部發展局規劃地政科建築物條例（第123章）上訴審裁小組委員
» Member, Disciplinary Tribunal Panel, Electricity Ordinance (Cap.406), Environment Bureau, Government Secretariat, HKSAR	» 香港特區政府總部環境局電力條例（第406章）紀律審裁小組委員
» Editor, IEEE Transaction on Communications	» 國際電機電子工程師學會Transaction on Communications編輯
» Senior Technical Editor, IEEE Communications Magazine	» 國際電機電子工程師學會通訊雜誌高級技術編輯
» Professor of Information Engineering, The Chinese University of Hong Kong	» 香港中文大學信息工程學教授
» Chair Professor, Institute for Theoretical Computer Science, Tsinghua University, Beijing	» 北京清華大學理論計算機科學研究中心講座教授
» Vice Editor-in-chief, Chinese Journal of Electronics	» 中國電子學報副主編
» Adviser, Hong Kong Federation of Education Workers	» 香港教育工作者聯會顧問
» Member, Technical Committee of Information Technology Standardization, Guangdong Province, China	» 中國廣東省信息技術標準化技術委員會委員
Dr. Chao Shen-chang, Vice President and Group Director 副總裁及研發群組總監 趙盛章博士	
» Advisory Member, Advancing Technology for Digital Home	» 數字家庭技術進展顧問委員會委員
» Adviser, e-Learning Technical Advisory Council, Hong Kong Education City Ltd.	» 香港教育城電子學習技術諮詢委員
» Adviser for External Advisory Committee, Computer Science Department, The Hong Kong University of Science and Technology	» 香港科技大學計算機科學系外部諮詢委員會委員
» Member of Advisory committee, Department of Information Engineering, The Chinese University of Hong Kong	» 香港中文大學信息工程學系諮詢委員會委員
» Member, Assessment Panel, Small Entrepreneur Research Assistance Programme , Innovation and Technology Commission, HKSAR	» 香港特區政府創新科技署小型企業研究資助計劃評審委員會委員

Dr. Wang Keh-chung, Vice President and Group Director 副總裁及研發群組總監 王克中博士	
» Member, Technical Program Review Committee, IEEE, International Microwave Symposium 2010 and Vice Chair, TA-24 on "Digital Processing Circuits and Systems at GHz Speed"	» 國際電機電子工程師學會，二零一零年國際微波會議論文評審委員及技術24組「GHz數字處理電路和系統」副主席
» Member, IEEE, MTT-9 Technical Coordinating Committee, "Digital Signal Processing" 2011	» 國際電機電子工程師學會二零一一年微波理論及技術分會聯絡委員會MTT-9委員
» Member, Technical Program Committee, IEEE International Symposium on Radio-Frequency Integration Technology 2011	» 國際電機電子工程師學會二零一一年國際射頻集成技術會議論文評審委員
» Reviewer, IEEE Communications Magazine, 2010	» 二零一零年國際電機電子工程師學會通訊雜誌論文評審委員
» Reviewer, IEEE MTT Magazine, 2011	» 二零一一年國際電機電子工程師學會微波理論及技術雜誌論文評審委員
Dr. Wu Enboa, Vice President and Group Director 副總裁及研發群組總監 吳恩柏博士	
» Expert, Bureau of Information and Technology, Fujian Province, China	» 中國福建省信息化局專家
» Organizing Committee Member, Green Lighting China Expo and Forum 2010	» 第四屆中國國際新光源新能源照明展覽會暨論壇籌備委員會委員
» Chairman, "Display Application" Session, The 7th China International Forum on Solid State Lighting	» 第七屆中國國際半導體照明論壇顯示應用分會主席
Mr. David Kwong, Vice President and R&D Director 副總裁及研發總監 鄺國權先生	
» Member, Senior Member Review Board, IEEE	» 國際電機電子工程師學會高級會員評審會成員
Dr. James Lei, Director 總監 雷志斌博士	
» Reviewer, IEEE Communications Magazine	» 國際電機電子工程師學會通訊雜誌評審員
Dr. Jay Liou, Director 總監 劉遠昭博士	
» Editorial Member, Advancing Technology for Digital Home	» 數字家庭技術進展編委會委員
Dr. Daniel Shi, Director 總監 史訓清博士	
» Guest Professor, The Peking University	» 北京大學客席教授
» Guest Professor, The Shanghai Jiaotong University	» 上海交通大學客席教授
» Expert, Guangdong Advanced Microelectronics Packaging and Testing Engineering Technology Centre	» 中國廣東省先進微電子封裝測試工程技術研究開發中心專家
» Technical Chair, The 12th International Conference on Electronic Packaging Technology and High Density Packaging	» 第十二屆電子封裝技術和高密度封裝國際會議技術委員會主席
Dr. Tsai Chen-jung, Director 總監 蔡振榮博士	
» Executive Committee Member, Green Lighting China Expo and Forum 2010	» 第四屆中國國際新光源新能源照明展覽會暨論壇執行委員會委員
» Board Director, Shenzhen Flat Panel Display Industry Association	» 深圳市平板顯示行業協會董事會成員
Ms. Monisa Wan, Director, Human Resources 人力資源總監 温小雯女士	
» Vice President and Council Member, the Hong Kong Institute of Human Resources Management	» 香港人力資源管理學會副會長及理事會成員
» Council Member, Oxfam Hong Kong	» 樂施會董事會成員
» Member, Careers Advisory Board, the University of Hong Kong	» 香港大學就業輔導委員會委員

Reports of R&D Groups and Subsidiary
研發群組及附屬機構報告

Sparks of Innovations Enrich Lifestyle

創意　帶來豐盛生活

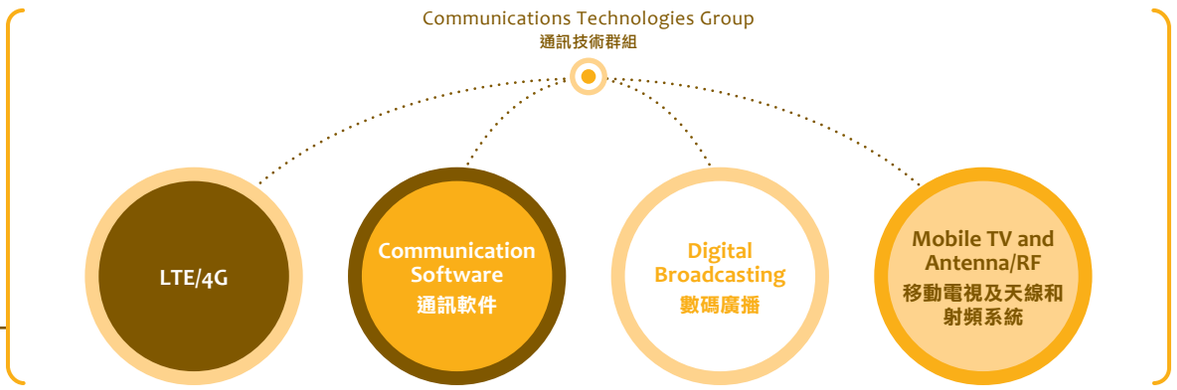
Communications Technologies Group
通訊技術群組

With accomplishments in LTE/4G technologies, we will continue developing high impact enabling technologies for ubiquitous information networking, as well as building competitive advantages with innovations.
本群組在LTE/4G技術上已取得卓越成績，在此基礎上，我們將繼續努力研發具影響力的核心通訊技術，並透過持續的科技創新來保持競爭力。

Dr. Henry Ye 葉暉博士
Acting Vice President and Group Director
Communications Technologies Group
通訊技術群組 署理副總裁及研發群組總監

In the year under review, Communications Technologies (CT) Group continued developing and delivering applied information and communications technologies (ICT) in LTE/4G, communication software, digital broadcasting, mobile TV and antenna/RF systems.

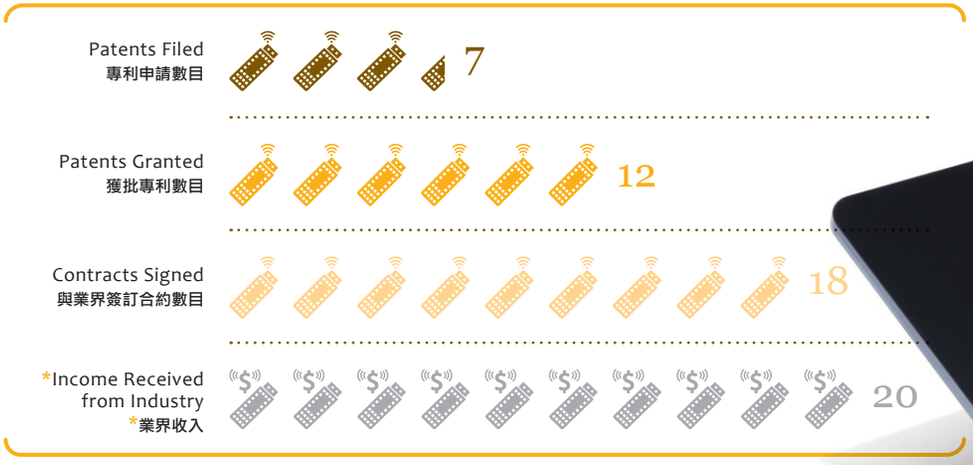
回顧過去一年，通訊技術群組繼續研發和提供多個領域的資訊及通訊應用技術，其中包括4G/LTE、通訊軟件、數碼廣播、移動電視及天線和射頻系統。



CT engineers working in the lab
通訊技術群組的工程師在實驗室工作

CT made remarkable achievements in patents filed, patents granted, technology transfers and income from industry. A total of 12 patents were granted in areas including MIMO, antenna, OFDM and wireless networks. A total of seven patent applications were filed in areas covering LTE, PLC and wireless networks. Of the 18 technology transfers signed during the year, Hong Kong customers accounted for more than 50 per cent, with the rest from Taiwan, the Mainland, United States and United Kingdom. A total HK$20 million income was received from industry which included more than HK$4 million royalty income.

通訊技術群組在專利的申請及獲批、技術的轉移及從業界取得的收入各方面，都取得了卓越的成績。其中獲批的專利共十二項，範疇包括實用多天線(MIMO)、天線、OFDM和無線網絡。在LTE、電力線傳輸和無線網絡等方面共提交了七項專利申請。在技術轉移方面，群組與業界簽訂的合約達十八份，其中百分之五十以上的客戶來自香港，其他客戶來自台灣、中國內地、美國及英國。本年度群組從業界獲得收入總額共二千萬港元，其中包括超過四百萬港元的版稅收入。



*Including cash and in-kind contribution 包括現金及物資資助

iPhone Wireless Charger
iPhone無線充電設備

iPhone Wireless Charger
iPhone 無線充電設備

Advanced inductive charging pad and case offer a new and convenient way of wireless charging for iPhone
應科院研發的iPhone無線充電設備，簡單易用

Innovations
技術突破

CMMB Demodulator Module
CMMB解調模組

ASTRI CMMB solution supports mobile TV reception in more than 320 cities in Hong Kong and the Mainland, enabling users to enjoy infotainment anytime anywhere
應科院的CMMB方案讓用戶可以在香港及內地超過三百二十個城市收看移動電視，隨時隨地享受資訊娛樂

ASTRI CMMB Demodulator Module provides solutions for mobile TV and PMP
應科院CMMB解調模組為移動電視及PMP提供解決方案

3GPP LTE Technologies

The Group, together with its partner, developed the world's first TD-LTE data card baseband SoC chip which China Mobile selected for its TD-LTE technology trial in the 2010 World Expo in Shanghai.

The LTE TDD/FDD dual-mode FemtoCell baseband core technologies that CT developed include all physical layer reference designs on a prototype hardware and contain programmable devices optimized for FemtoCell.

CT is developing a dual-mode TD-LTE and TD-SCDMA RF transceiver chip which supports multiple frequency bands: 1.9 GHz, 2.0 GHz, 2.3 GHz and 2.6 GHz, along with programmable bandwidth from 1.4 MHz to 20 MHz. It also supports MIMO functions for better system performance.

CT is also developing the LTE-EPC (Evolved Packet Core) solution comprising three logical network entities: Mobility Management Entity (MME), Serving Gateway (S-GW) and Packet Data Network Gateway (PDN-GW).

Network Dimension System (NDS)

The NDS, a broadband service management system developed by CT, provides comprehensive IP Network Management – MPLS, LSP, VLL, VPLS, etc. It simplifies the operator's daily maintenance work and provides a proactive maintenance method. The NDS software can be easily customized to support multiple vendors' network elements.

3GPP LTE技術

通訊技術群組與其合作夥伴共同研發出全球第一塊TD-LTE終端的基帶通訊晶片，獲中國移動選用在上海世博會建設的TD-LTE試驗網絡。

通訊技術群組研發出LTE家庭基站基帶核心技術，其中包括硬體原型機上所有的物理層參考設計和支援系統優化的可編程設計裝置。

群組在開發雙模TD-LTE/TD-SCDMA射頻收發晶片。該晶片具有1.4MHz至20MHz帶寬的可編程設計，支持多個頻段，包括1.9GHz、2.0GHz、2.3GHz和2.6GHz；同時還支持MIMO功能，來提高整體系統性能。

群組也正在研發LTE-EPC（LTE演進核心網路）解決方案，包括三個模塊－移動管理模塊（MME）、服務網關（S-GW）和包數據網網關（PDN-GW）。

網絡管理系統（NDS）

NDS是一個功能完備的IP網絡管理系統—MPLS、LSP、VLL、VPLS等等。NDS為運營商提供靈活方便的網絡日常維護解決方案。其獨特的軟件結構設計很容易切合不同廠商的設備或型號。

Digital and Mobile TV Technologies

In the area of Digital Television Terrestrial Multi-media Broadcasting (DTMB), a joint R&D laboratory formed between ASTRI and Tsinghua University developed core technologies and IPs in DTMB Single Frequency Network (SFN) adaptor, DTMB receiver testing and certification platform, DTMB STB and integrated TV reference design, and DTMB instrumentation and testing platform.

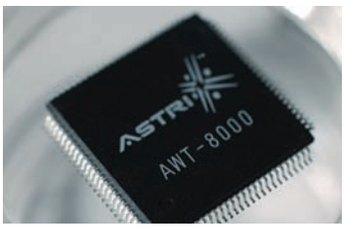
DTMB baseband receiver IC design supports the China DTMB system standard (GB20600-2006). An innovative architecture design was devised to achieve low power and small die size. Low-power design methods at logic level were applied to further abbreviate power consumption. Hardware resource sharing and schedule optimization architecture further reduced the die size.

Multi-mode mobile TV RF tuner works in VHF and UHF bands supporting T-DMB, DVB-T/H and CMMB standards. Fabricated in 0.13 µm CMOS technology, the tuner achieved 82 mW power consumption and small die size. The tuner used QFN32 package with standard I2 C interface with baseband.

RF Jamming Technology and Solution

CT's RF jamming technology and solution are being used for traffic management in Hong Kong. This new RF jamming technology, previously used only for military purposes, can now be used commercially. Power outputs were adjusted to meet OFTA specifications, allowing more widespread usage in road toll systems and security networks. This technology solves the problem of double-charging which is common in road toll systems around the world.

ASTRI's Multi-mode RF Tuner Chip facilitates mobile TV reception from operators around the world
配備應科院開發的多模移動電視調諧器晶片，用戶可以體驗在移動裝置上接收來自全球各地的電視節目



ASTRI's single and multi-mode mobile TV demodulator ICs provide solution for CMMB, DVB-T/H and T-DMB
應科院的單模和多模移動電視解調晶片為CMMB，DVB-T／H及T-DMB移動電視提供解決方案

ASTRI CMMB Demodulator Module provides solutions for mobile TV and PMP
應科院CMMB解調模組為移動電視及PMP提供解決方案

數碼及移動電視技術

在數碼電視地面多媒體廣播（DTMB）核心技術方面，由應科院及清華大學組成的聯合實驗室共同開發了DTMB核心技術和知識產權，包括DTMB單頻網（SFN）適配器、DTMB接收機測試和驗証平台、DTMB機頂盒與一體機參考設計及DTMB儀器及測試平台。

DTMB基帶接收晶片的設計，支持中國DTMB系統標準（GB20600-2006）。創新的構造設計實現了低功耗和細小的晶片尺寸。其邏輯層的低功耗設計方案，進一步減少了晶片功耗。其硬件資源共用和調度優化結構進一步縮少了晶片尺寸。

多模移動電視射頻調諧器支持VHF和UHF頻段，支持包括T-DMB、DVB-T/H和CMMB在內的多種移動電視解調標準，晶片設計採用0.13微米CMOS技術、82mW低功耗、細小晶片尺寸。調諧器並採用QFN32構裝和標準的I2C基帶接口。

射頻干擾技術及解決方案

通訊技術群組的射頻干擾技術為香港交通管理提供了解決方案。一度只應用於軍事方面的射頻干擾技術，經過研發，現在可作商業應用。為了令該技術能更廣泛地應用在道路繳費系統，設計團隊將射頻干擾技術改良及調整輸出功率，使其符合電訊局的規格要求。這項技術也解決了世界各地道路繳費系統常見的雙重收費問題。

DTMB Set-top Box developed by the joint laboratory set up by ASTRI and Tsinghua University
由應科院及清華大學合作成立的實驗室所開發的DTMB機頂盒

Commercialization
市場化

TD-LTE terminal technologies were licensed to Innofidei, an IC design house on the Mainland. CT worked with them to tape out the world's first TD-LTE terminal baseband SoC chip and built TD-LTE data card products with the chip. This marked a major technology breakthrough on the Mainland because terminal baseband SoC markets have always been dominated by global leaders. In addition, the TD-LTE data card was selected as a technology showcase by China Mobile for TD-LTE deployment at the Shanghai World Expo.

LTE FDD/TDD Femtocell baseband core technologies were licensed to a world leading Femto baseband solution provider. CT's technologies are being integrated into their products to deliver LTE FDD/TDD total solutions to world leading service providers.

LTE-EPC technology was licensed to a leading global wireless solution company in the Greater China region.

NDS was deployed by a tier-1 Taiwan operator as its backbone network to monitor the IP backbone MPLS VPN networks comprising hundreds of network elements from different vendors. The customer commented that the system troubleshoots and responds to network issues more effectively and efficiently.

CT's antenna & RF technologies were licensed to more than 10 companies. Examples of products being sold or used in the market include an iPhone wireless charger commercialized by a local company, auto-finder products developed by a U.S. company, and RF jamming technology and solution being used for traffic management in Hong Kong.

TD-LTE終端技術已授權予一家在國內的集成電路設計公司—北京創毅視訊科技有限公司。雙方共同研發出全球第一塊TD-LTE終端基帶晶片，並應用於TD-LTE數據卡產品。這標誌著中國通訊技術的重大突破，因為它改變了終端基帶晶片市場一直由國外企業所主導的狀態。該TD-LTE產品獲中國移動選用，在上海世博會場內的TD-LTE網絡作技術演示。

LTE FDD / TDD 家用基站基帶核心技術已授權給一間全球領先的家用基站基帶解決方案供應商。群組的技術結合客戶的產品，成功為全球領先的運營商提供了 LTE FDD / TDD 的全面解決方案。

通訊技術群組的LTE-EPC技術，已授權予一家位於大中華地區的業界領先無線電解決方案供應商。

網絡管理系統（NDS）已部署於台灣一家最大營運商的骨幹網絡，用以監控和管理IP骨幹網中的 MPLS VPN 網絡。這些網絡包含數以百計來自不同廠商的網絡設備。該客戶認為NDS能更快捷和更有效地發現並解決網絡問題。

通訊技術群組的各種天線及射頻技術已授權予十餘家企業。在市場上已經有相關的產品和服務出售，例子包括：一家本地公司利用該技術開發的iPhone無線充電器；一家美國公司開發了應用於車輛的無限測向產品；此外，射頻干擾技術和解決方案，也被應用於香港交通管理方面。

多模手機電視基帶SoC已授權給一間大中華地區的晶片設計公司。該晶片設計為製造商提供了一個具高成本效益的，可支持多標準的移動電視手提式播放機解決方案。製造商可通過軟件功能配置來配合全球移動電視市場的需求。

A Portable WiMAX Terminal Device can perform mobile video surveillance and real-time video streaming for immediate response to incidents such as traffic jams or accidents
利用便攜式WiMAX接入終端進行移動視頻監控及視頻直播，在發生事故如交通堵塞或意外時，可即時作出應變

Multi-mode mobile TV baseband SoC was licensed to an IC design company in the Greater China region. CT's multi-mode SoC design provides manufacturers with cost-effective means to produce the multi-standard portable mobile TV players. Manufacturers can better control their inventories through software reconfiguration of their devices to address changes in the dynamic global mobile TV market.

DTMB baseband system design was licensed to an electronics equipment company on the Mainland and was used in the design of customer's end products.

CT's multi-mode digital TV RF tuner was licensed to a high technology company on the Mainland. Both dual-mode CWPAN/ZigBee RF transceiver IC and multi-mode digital TV RF tuner IC are available for commercial licensing.

DTMB的基帶系統設計，已授權給中國內地一家電子設備公司，獲顧客應用在他們的產品設計中。

通訊技術群組的多模數碼電視射頻調諧器技術已經授權給國內一家高科技公司。雙模CWPAN/ZigBee射頻收發器及多模數碼電視射頻調諧器的全套晶片已可供業界選用。

TD-LTE Data Card developed by ASTRI and industry partner
由應科院與合作夥伴共同開發的TD-LTE數據卡

LTE Application
LTE技術應用

LTE enables mobile HD video conferences
利用LTE技術進行高清視頻會議

Future Development
未來發展

Moving forward, CT will adopt three-fold R&D strategies. First of all, the Group will continue focusing on R&D in LTE technologies to maintain ASTRI's leading position in TD-LTE and its competitiveness in the evolution of the technology in the industry. CT's focuses include dual-mode LTE FDD/TDD baseband core, LTE Femtocell Gateway solution, cost-effective LTE FDD/TDD RF transceiver chip, and repeater and digital RF for 2G/3G/LTE and beyond.

Secondly, CT will expand R&D scope for emerging technologies and capture new market opportunities including cloud computing technology and management; smart OFDM PLC SoC for power metering in smart grid; and ICT for Intelligent Transport System.

Thirdly, CT will strengthen academic collaboration with tier-1 universities, such as Tsinghua University, to collaborate on forefront technology innovations and IP creations.

通訊技術群組的未來研發策略主要有三方面。首先群組會繼續專注於LTE的研發，以保持應科院在TD-LTE的領先地位及其在LTE演變過程中的競爭力。群組的研發方向包括雙模式LTE FDD/TDD基帶核心技術；LTE家庭基站網關解決方案；具成本效益的LTE FDD/TDD射頻收發器晶片；適用於2G/3G/LTE的可重組中繼器和數碼射頻技術。

第二方面，群組會擴大新興技術研發範圍，把握新興市場所帶來的機遇，包括雲計算技術和管理；適用於智能電網的電力線Smart OFDM多載波通訊晶片；資訊與通訊技術在智能交通系統的應用。

第三方面，群組會加強與頂級大學的合作，包括繼續與清華大學合作，在前沿科技方面不斷的創新和創造知識產權。

picoChip's LTE Femtocell base station encasing ASTRI's LTE PHY technology
採用了應科院LTE物理層核心技術的picoChip LTE家庭基站

Project Highlights
研發項目

		Project 項目	Duration 時期
1	P	Access Gateway Platform for LTE Access Networks LTE網絡接入網平台	Jan 2011 – Dec 2012 二零一一年一月至二零一二年十二月
2	P	Enhanced DTMB Network 先進的DTMB網絡技術	Jan 2011 – Jul 2012 二零一一年一月至二零一二年七月
3	P	Reconfigurable RF 可重構射頻	Nov 2010 – Oct 2012 二零一零年十一月至二零一二年十月
4	P	LTE TDD/FDD Dual-mode Baseband Cores LTE時分及頻分雙模基帶核心	Sep 2010 – Mar 2012 二零一零年九月至二零一二年三月
5	P	Dual-mode TD-LTE/TD-SCDMA RFIC Transceiver TD-LTE/TD-SCDMA雙模射頻收發器晶片	Jun 2010 – Dec 2012 二零一零年六月至二零一二年十二月
6	P	Multi-mode Mobile TV Baseband and Media Processor SoC 多模移動電視解調器及多媒體處理器系統晶片	Jun 2010 – Sep 2011 二零一零年六月至二零一一年九月
7	P	Dual-mode Digital TV Receiver Chip and Reference Design 雙模數碼電視接收晶片及參考設計	Jun 2009 – Mar 2011 二零零九年六月至二零一一年三月
8	P	TD-LTE Femto BTS Baseband Core TD-LTE家庭基站基帶處理內核	Jun 2009 - Dec 2010 二零零九年六月至二零一零年十二月
9	P	Reconfigurable Multi-mode Digital TV RF Tuner 可重置多模數碼電視射頻調諧器	Mar 2009 - Sep 2010 二零零九年三月至二零一零年九月
10	P	Wireless Network Edge Solution 無線接入網方案	Jan 2010 - Apr 2011 二零一零年一月至二零一一年四月
11	P	TD-LTE Terminal Baseband Core TD-LTE終端基帶內核	Nov 2009 - May 2011 二零零九年十一月至二零一一年五月
12	P	RF Assemblies 先進的射頻技術	Sep 2009 - Mar 2011 二零零九年九月至二零一一年三月
13	P	Multi-mode Mobile TV Baseband Demodulator 多模移動電視基帶解調器	Jul 2008 - May 2010 二零零八年七月至二零一零年五月
14	P	ASTRI-Tsinghua University MBC Joint Lab–Foundation Platform Technologies 應科院 — 清華大學多媒體廣播與通訊聯合研究實驗室基礎平台技術	Jan 2008 - Dec 2010 二零零八年一月至二零一零年十二月
15	I	Advanced and Affordable MRI 先進和經濟的磁共振成像	Nov 2008 – Apr 2010 二零零八年十一月至二零一零年四月
16	S	Next Generation Broadcasting (NGB) EoC 新一代廣播電視網的電纜接入技術 — 高性能同軸電纜接入網	Jan – Jul 2011 二零一一年一月至七月
17	S	TD-LTE Propagation Study and Cell Planning TD-LTE訊號傳送研究與佈網規劃	Oct 2010 – Apr 2011 二零一零年十月至二零一一年四月
18	S	Smart OFDM Technology for Smart Meter and Smart Grid 智能電錶、智能電網應用的多載波通訊技術	May – Nov 2010 二零一零年五月至十一月
19	S	Evaluation Platform for DTMB Deployment 中國地面數碼電視部署: 傳輸網路覆蓋評估平台	Feb – Jul 2010 二零一零年二月至七月
20	S	Core-IP R&D for 802.16m 802.16m 標準核心技術研發	Sep 2009 – May 2010 二零零九年九月至二零一零年五月

P Platform Project 平台項目

S Seed Project 種子項目

I Industry Collaborative Project 業界合作項目

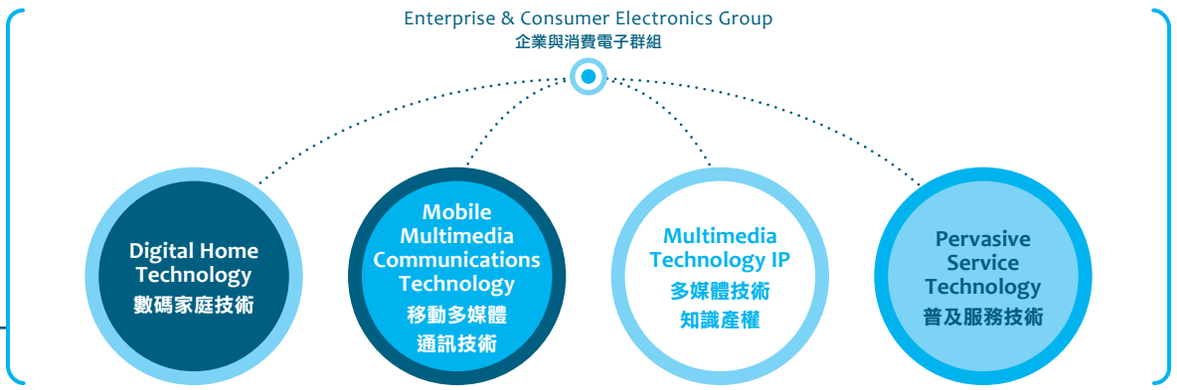
Enterprise & Consumer Electronics Group
企業與消費電子群組

Focusing on technology development in digital smart electronics connected with cloud service, ECE, with excellent products and services, endeavours to become one of the top R&D teams in the industry.
企業與消費電子群組專注於與雲端服務連接的數碼智能電子產品的技術開發，憑藉超卓的產品和服務，致力成為業內頂尖的研發團隊。

Dr. Chao Shen-chang 趙盛章博士
Vice President and Group Director
Enterprise & Consumer Electronics Group
企業與消費電子群組 副總裁及研發群組總監

The mission of Enterprise & Consumer Electronics (ECE) Group is creating and expanding Hong Kong's core intellectual property for multimedia over IP technology for networked consumer electronics and applications. These dedicated efforts will enhance competitiveness of local industries, help them move up the value chain and capture future job and business growth opportunities presented by the newly emerging worldwide wireless and multimedia consumer market.

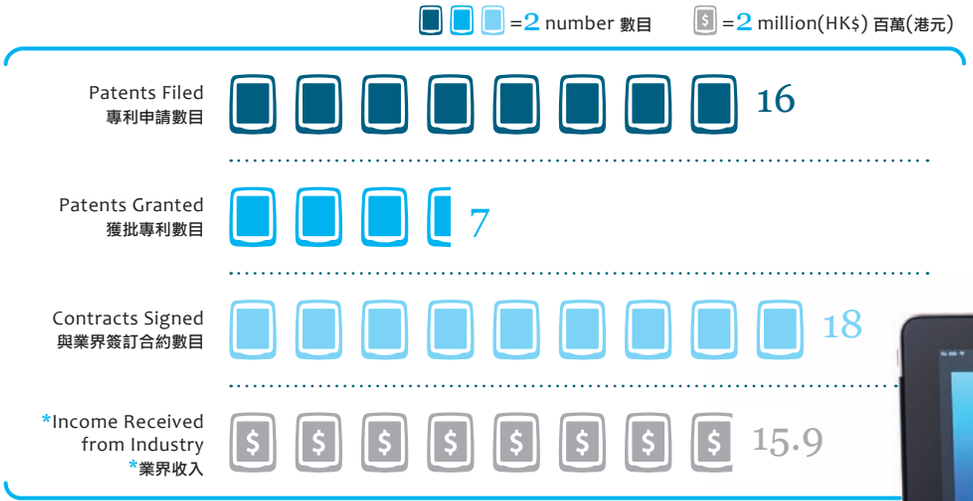
企業與消費電子群組的使命是在多媒體方面創造和擴展香港的核心技術知識產權，開發網絡互聯的消費電子產品及應用，藉此加強本地業界的競爭能力，幫助產業向價值鏈上游轉移，把握全球無線及多媒體消費新興市場所帶來的就業機會和商機。



ECE Product Development Laboratory
企業與消費電子群組
產品開發實驗室

ECE filed 16 patent applications regarding the core technologies it developed during the year and was granted seven patents. It signed 18 contracts for technology dissemination to industry. The amount of cash and in-kind ECE received from industry was about HK$16 million, increasing more than 33 per cent over last year.

企業與消費電子群組於本年度就其核心技術作出十六項專利申請，並取得七項專利。與業界簽署十八份技術轉移合約，取得現金和物資資助總額約共一千六百萬港元。從業界所得收入與去年比較增長超過百分之三十三。



*Including cash and in-kind contribution 包括現金及物資資助

Streaming Videos
流媒體視頻

Streaming videos with friends anywhere anytime is fun
隨時隨地享受流媒體視頻

Innovations
技術突破

iPod Docking Station
iPod儲存裝置站

iPod Docking Station provides spatial virtual surround enhancement
iPod儲存裝置站可增強空間虛擬環繞聲

OTK5256 Audio CODEC
OTK5256音頻編解碼器

iPod Docking Station
iPod儲存裝置站

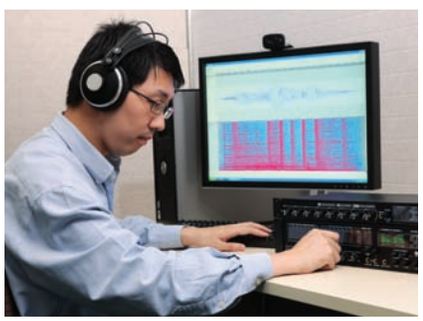
ECE's audio SoC chip was a result of an Industry Collaborative Project (ICP) and has already been fully commercialized. One of the latest products deploying this chip is the TEAC SR-8oi radio iPod dock. In a fiercely competitive market, the chip besides giving configurations at a very competitive cost, also provides differentiation features using the ASTRI Audio Processing IP within the SoC.

ECE ported Flash Lite to several devices for e-book and e-learning products. When Flash Lite was bundled with mobile peer group service technology and learning management system developed by the Group, a powerful platform supporting mobile learning was created.

群組與客戶透過業界合作項目開發的音頻系統級晶片已全面商業化。其中一款使用該晶片的最新產品為 TEAC SR-8oi 收音機與 iPod 基座。在競爭激烈的市場上，應科院利用獨有的音頻處理技術知識產權，給產品提供了具競爭力的價格和功能差異性。

群組將 Flash Lite 植入數個電子書及電子學習產品。Flash Lite 的功能加上群組已開發的移動群組服務技術及學習管理系統，組合成一個強而有力的移動學習平台。

企業與消費電子群組的電子學習方案包括將教與學的功能植入Android™電子書，並將有關香港教科書特需功能以擴充的形式加入國際電子書標準格式。群組正與香港理工大學的眼科視光學院合作研究如何在閱讀電子書時，令眼睛感覺舒適。



ECE Audio Testing Laboratory
企業與消費電子群組音頻測試實驗室

ECE's e-book for e-learning solution incorporates teaching and learning functions into an Android™ based e-book device and adds extensions related to Hong Kong textbooks in an international e-book format standard. ECE was also collaborating with School of Optometry of the Hong Kong Polytechnic University to research into eye-comfortable e-book reading.

ECE successfully developed video summary technology. It can condense one hour's video into few minutes' while preserving details of the original video. It reduces video storage and speeds up browsing for target objects in videos.

ECE sponsored the research project on Low-cost Smart Power Quality Meters conducted by City University of Hong Kong. The project received Excellent Product Awards at the 12th China Hi-Tech Fair in 2010.

Conference Phone
會議電話

Meetings made easy with ASTRI developed conference phone
以應科院技術開發的電話進行會議，十分方便

CES award-winning conference phone
在國際消費電子展獲獎的會議電話

群組成功開發視頻影像內容摘要技術，可以將一小時的視頻影像壓縮至僅僅數分鐘，但仍然保留視頻影像中的重要細節。該技術不但大大地減少視頻影像的儲存，而且便於快速查閱視頻影像以尋找影像中的目標事物。

企業與消費電子群組贊助香港城市大學研究項目－低成本智能型電能質量監控電表，於二零一零年「第十二屆中國國際高新技術成果交易會」勇奪優秀產品獎。

Commercialization
市場化

Eight Limited High Definition Set-top Box/ Personal Video Recorder (HD STB/ PVR)

ECE partnered with Eight Limited to launch the world's first all-in-one HD STB/PVR in Hong Kong, Macau and the Mainland. The flagship product NOVA SM908 has won three industry awards and is positioned as a high-end product with the largest market share in Hong Kong.

TEAC SR-8oi Hi-Fi AM/ FM Radio iPod Dock

Through an Industry Collaborative Project, ECE and Optek Electronics Company Limited, a Shenzhen-based IC solution provider for consumer electronics, jointly developed an advanced multimedia audio codec SoC ASIC (OPT5256) that supports multiple music format codec and audio effect post-processing. The SoC chip is used by TEAC for its SR-8oi iPod dock.

Eight Limited的高清機頂盒／個人視頻錄像機

企業與消費電子群組與 Eight Limited 合作開發全球首台集全功能於一身的高清機頂盒／個人視頻錄像機，並在香港、澳門及內地市場推出。其旗艦級產品 NOVA SM908 已先後榮獲三項大獎，該產品在香港高端市場已佔據最大的市場份額。

TEAC的SR-8oi高傳真AM／FM收音機與iPod基座

企業與消費電子群組夥同歐思電子有限公司，一家位於深圳的消費電子集成電路解決方案供應商，展開一個業界合作項目，成功開發先進多媒體音頻編解碼系統級晶片（OPT5256）。該晶片可以支援不同音樂制式的編解碼及音頻效果後處理，客戶已將晶片用於TEAC的SR-8oi iPod基座。

Home surveillance while out shopping
隨時隨地監察家居安全

Collaboration with Government to put new technologies into public use

Targeted for first product/technology trials, ECE teamed up with several Government agencies to develop products catering to their specific needs, including e-learning solutions for the Education Bureau's e-learning pilot programme, mobile surveillance system for the Hong Kong Police Force, and tele-health platform for public hospitals. These collaborations aimed at bringing wider economic and social benefits to the community.

與政府機構合作將新技術作公共用途

企業與消費電子群組與多個香港政府機構合作，開發符合政府機構特殊需要的產品/技術，並以政府機構作為先期試驗平台，合作項目包括為教育局的電子學習先導計劃提供電子學習方案；為香港警務署研發移動監測系統及為公立醫院開發遠程照護平台。合作的目的是造福社會和創造經濟利益。

A successfully commercialized HD set-top box
已成功商品化的高清機頂盒

Dual-tuner HD Set-top Box/ PVR
雙高清機頂盒／個人視頻錄像機

Eight Limited's flagship HD set-top box/ PVR can be operated by a smart phone for enhanced user experience

Eight Limited的旗艦級高清機頂盒／錄影機可經由智能手機操作以豐富使用者體驗

Future Development
未來發展

Smart Digital Home

Building on the success of HD STB platform (supporting DVB-T, DMB-T/H and IP connection) along with interactive TV Man Machine Interface (MMI) technologies, ECE will further strengthen its leading position through TV-centric smart digital home applications using ECE SoC with proven hardware and solution.

In November 2010, ECE established a Working Group on Android™ Applications, a special interest group under the Digital Living Consortium, to enlist IP providers, SoC companies, middleware companies, system companies and the application development community for innovative Android™ applications.

智能數碼家庭

繼高清機頂盒平台(支持DVB–T、DMB–T／H和網絡連接)及互動電視人機界面技術的成功推出，企業與消費電子群組將利用自行開發的系統晶片，發展以電視為核心的智能數碼家庭應用，進一步鞏固在智能家居技術的領先地位。

群組於二零一零年十一月在「數碼生活聯盟」旗下成立「Android™應用協作委員會」，招募系統晶片知識產權供應商、系統晶片公司、中間件公司、系統公司及應用程式開發公司等為會員，共同推廣Android™的創新應用。

e-Learning

With the initial success of e-book device for e-learning, ECE is expanding its e-learning programme to offer a Learning Management System for course design and teaching, along with Content Bridge capability to support multi-content sources access. A new generation e-book for e-learning tablet with larger screen developed by ECE is also added as part of the e-learning total solution.

電子學習

繼以電子學習為目標的電子書成功面世後，群組將進一步擴展電子學習計劃，提供學習管理系統，包括教學課程設計、教學及橋接功能以支援從多個出版商獲取內容。系統還加入由群組開發的新一代大螢幕電子學習平板電腦，以組成一個完整的電子學習方案。

Smart Sensor Computing

Based on the established sensor management platform, ECE will develop a few specific applications, including tele-health, mobile surveillance and building energy management.

智慧感測器計算

企業與消費電子群組會基於先前建立的感測器管理平台，開發幾項特別的應用，包括遠程照護、移動監控及建築物節能管理。

Document Digital Rights Management (DRM)

Built on the scalable broadcast encryption platform, ASTRI's document DRM can support volumes of titles and users without incurring heavy cost on servers and network bandwidth. ASTRI's DRM can support all popular formats, e.g. doc, ppt, pdf and ePub, with flexible rights objects and high-efficiency three-screen devices (STB/TV, PC and mobile terminal) to enable a new digital e-book paradigm shift for publishers, content producers and end users.

文檔數碼版權管理

以可擴容的廣播加密平台為基礎，應科院的文檔數碼版權管理系統可以支援大量使用者而不會導致過大的伺服器負載和網路流量。此系統可以支援所有流行的檔案格式，如doc、ppt、pdf和ePub等。它使用靈活的版權物件和高效的三種螢幕設備(機頂盒/電視、電腦及移動終端)，為出版商、內容製造商和終端使用者促成數碼電子書的範式轉換。

Personal Assistant for e-Learning (PAL)
易學夥伴

Personal Assistant for e-Learning (PAL)
易學夥伴

Students making use of PAL to facilitate e-Learning anytime anywhere
學生可以使用「易學夥伴」，隨時隨地進行電子學習

Project Highlights
研發項目

		Project 項目	Duration 時期
1	P	BE DRM for Embedded P2P IPTV over Internet 適用於嵌入式點對點網絡電視的廣播加密數碼版權管理方案	Apr 2009 – Jul 2010 二零零九年四月至二零一零年七月
2	P	Next Generation MMI for Digital Home 新一代數碼家庭人機界面互動技術	Jun 2009 – Sep 2010 二零零九年六月至二零一零年九月
3	P	P2P IPTV Quality of Experience 點對點網絡電視的質量體驗系統	Mar 2010 – May 2011 二零一零年三月至二零一一年五月
4	P	Core Technology for Multimedia Signal Processing and Commercialization, Intelligent Embedded Multimedia Information Processing Platform 多媒體處理核心技術及產業化，嵌入式智能多媒體信息處理平台	Mar 2010 – Aug 2011 二零一零年三月至二零一一年八月
5	P	Innovative MMI for Mobile Devices 創新的人機界面移動設備	Jun 2009 – Sep 2010 二零零九年六月至二零一零年九月
6	S	Mobile Social Networking Framework—Searching in a Personal Content Web 移動社交網絡框架—個人內容搜尋網絡	Aug – Dec 2010 二零一零年八月至十二月
7	S	e-Book for Education in Hong Kong 適用於香港教育界的電子書	Dec 2009 – May 2010 二零零九年十二月至二零一零年五月
8	I	90 nm CMOS High-end HD Multimedia SoC ASIC Chip 90納米CMOS高端高清多媒體系統級專用集成電路	Mar 2010 – Sep 2011 二零一零年三月至二零一一年九月
9	P	Multi-standard H.264/AVS/MPEG2 Low-cost, High Performance Full HD Video Decoder SoC 多標準H.264/AVS/MPEG2低成本高性能全高清視頻解碼器系統晶片	Jun 2009 – Dec 2010 二零零九年六月至二零一零年十二月
10	P	Multi-standard Video Encoder with Embedded DSP Core and Hardware Accelerators 帶嵌入式數碼訊號處理核心及硬件加速器的可調配多標準視頻編碼	Feb 2009 – Jan 2010 二零零九年二月至二零一零年一月
11	S	Power Quality Measurement and Analysis in Smart Meters 智能電錶的電能質量測量及分析	Dec 2009 – Jun 2010 二零零九年十二月至二零一零年六月
12	P	Intelligent Mobile Surveillance Technology Platform 智能移動監控技術平台	Dec 2010 – Jun 2012 二零一零年十二月至二零一二年六月
13	P	Open Research Platform for Learning Management System 學習管理系統的開放式研究平台	Dec 2010 – Nov 2012 二零一零年十二月至二零一二年十一月
14	P	Android™ Digital Home Technology Platform Android™ 數碼家庭技術平台	Aug 2010 - Aug 2012 二零一零年八月至二零一二年八月
15	P	High Efficient Video Post Processing Silicon IP for Digital TV 高性能數碼電視視頻後處理晶片	Sep 2010 - Mar 2012 二零一零年九月至二零一二年三月

		Project 項目	Duration 時期
16	P	65 nm Multimedia Full-HD SoC Development Platform 65納米多媒體全高清系統晶片開發平台	Jul 2010 – Jan 2012 二零一零年七月至二零一二年一月
17	P	Ultimate e-Book for e-Learning 用作電子學習的終極電子書	Jul 2010 – Jun 2012 二零一零年七月至二零一二年六月
18	P	Visual Signal Processing Technology for Emerging 3D Applications 針對新興三維視頻應用的視覺訊號處理技術	Jul 2010 – Jun 2012 二零一零年七月至二零一二年六月
19	P	Mobile Social Networking Framework 移動社交網絡框架	May 2010 – May 2011 二零一零年五月至二零一一年五月
20	S	A Content Delivery System with Digital Rights Management for School Pilot Programme 適宜電子學習容安全傳輸管理的試驗計劃	Oct 2010 – Mar 2011 二零一零年十月至二零一一年三月
21	S	Tele-health Platform 遠程健康照護平台	Mar – Aug 2011 二零一一年三月至八月

Remark: Android is a trademark of Google Inc. Use of this trademark is subject to Google's permission.
備注：Android是屬於谷歌的註冊商標，使用該商標必須得到谷歌的同意。

P Platform Project 平台項目

S Seed Project 種子項目

I Industry Collaborative Project 業界合作項目

IC Design Group
集成電路設計群組

ICD dedicates efforts to ensure customer success by offering innovative circuit IPs, IC-enabled solutions and design services. Our goal is to improve lifestyle through technology.

集成電路設計群組憑藉創新的電路設計、以晶片功能達成的解決方案和設計服務，致力協助每一位客戶取得成功。我們的目標是以科技改善人類的生活模式。

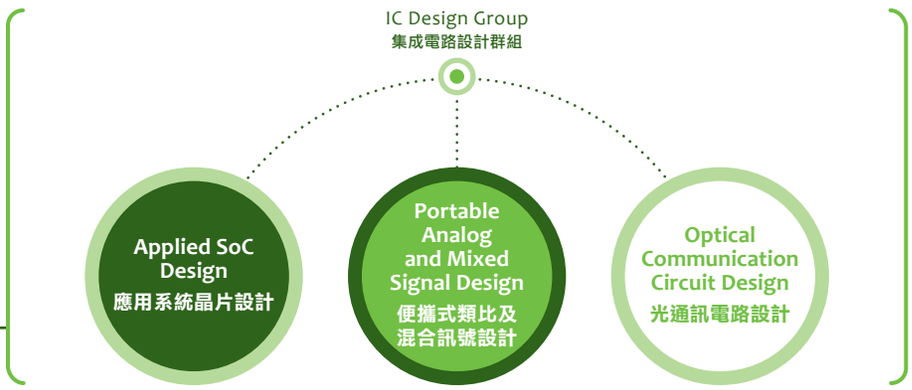
Dr. Wang Keh-chung **王克中博士**
Vice President and Group Director
IC Design Group
集成電路設計群組 副總裁及研發群組總監

IC Design (ICD) Group is tasked with developing state-of-the-art ICs and their applications. There are three teams under the Group, namely Applied SoC Design (ASD) team, Portable Analog and Mixed Signal Design (PAD) team and a new Optical Communication Circuit Design (OCD) team which was formed in late 2009.

In the year under review, ASD signed five licensing agreements with contract values totaling more than HK$1 million. It also signed one ICP with contract value of about HK$6.8 million.

集成電路設計群組致力開發尖端集成電路和有關應用。群組轄下有三個小組 - 應用系統晶片設計（ASD）組；便攜式類比及混合訊號設計（PAD）組；以及在二零零九年年底新成立的光通訊電路設計(OCD)組。

在審計年度內，ASD簽署了五份合約，金額超過一百萬港元。ASD還簽署了一份業界合作項目，合約價值達六百八十萬港元。



During the year, PAD made significant progress in technology development. It focused on the core areas of analog technologies while expanding their IP portfolios to support new industrial applications. PAD developed AC-DC and DC-AC conversion technologies targeting at green/renewable energy markets. It also delivered ultra-low energy data converters for low-power signal processing applications in consumer and communication markets.

Currently, PAD is working on advanced Analog Front End (AFE) IPs for multi-axis micro-accelerometer applications. It is also developing a complete platform for the Read Out IC (ROIC) for high resolution micro-bolometers used in un-cool infrared cameras and imaging equipment. In the pico-projector area, PAD delivered the LCoS (Liquid Crystal on Silicon) imager chip to a major pico-projector manufacturer. This design is the first of its kind in Hong Kong and the Mainland. In the electrostatic discharge (ESD) area, PAD's device and modelling team successfully delivered ESD protection IPs with 8KV HBM performance.

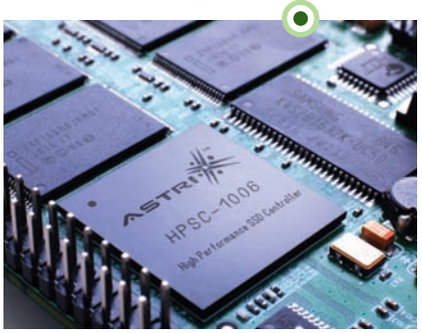
PAD filed 10 patent applications and was granted eight patents during the year. It also signed five contracts for disseminating technologies to industry.

ICD as a group received HK$10.6 million income from industry in the fiscal year 2010/11, representing a substantial 20 per cent increase over the previous year.

Patents Filed 專利申請數目	10
Patents Granted 獲批專利數目	8
Contracts Signed 與業界簽訂合約數目	11
*Income Received from Industry *業界收入	10.6

*Including cash and in-kind contribution 包括現金及物資資助

Solid State Disk Controller SoC
固態硬盤控制器晶片



PAD在研發新技術方面有長足的進展。PAD一方面專注於類比技術核心領域的研究，另一方面致力擴展知識產權庫以支持業界的新應用。PAD針對綠色／可再生能源市場，開發了AC-DC和DC-AC轉換技術。另外針對消費電子和通訊市場的低功耗訊號應用領域，提供了超低功耗數據轉換器。

目前PAD正努力研究用於多軸微加速度計的先進類比前端（AFE）的知識產權。PAD也正為高解像度微輻射熱計開發一個完整的讀出集成電路（ROIC）平台，用於非製冷紅外線攝影機和影像設備。在微型投影機領域，PAD為一個主要的微型投影機製造商，交付了矽基液晶（LCoS）成像晶片，這種設計在香港和中國內地尚屬首次。在靜電放電（ESD）領域，PAD器件和模型團隊已成功完成人體模式8KV的ESD保護方案。

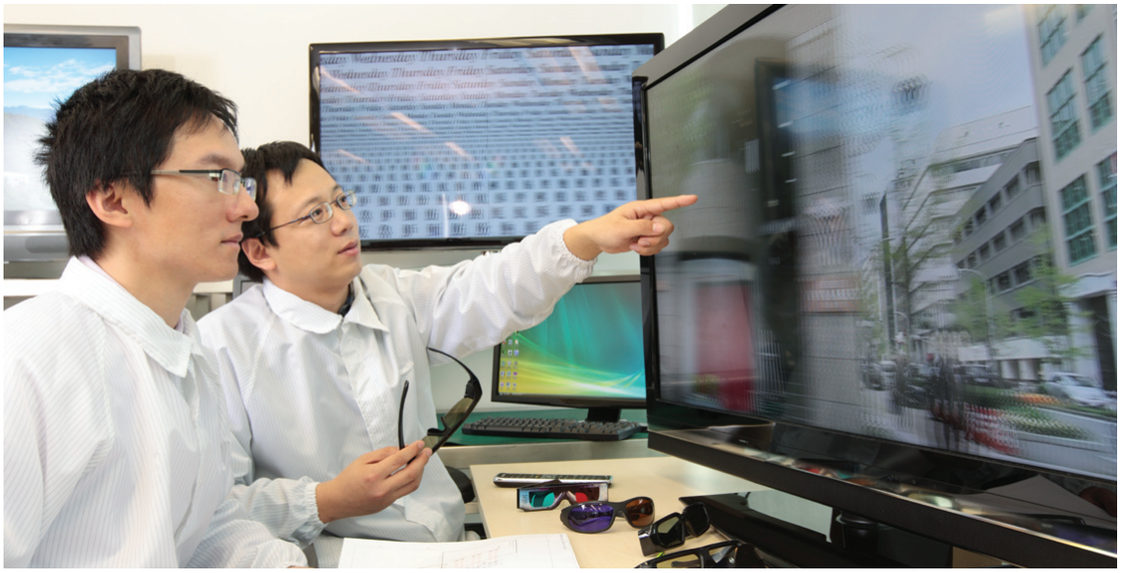
年內PAD提交了十項專利申請，並成功獲授八項專利。PAD共簽署了五份向業界轉移技術的新合約。

總括而言，集成電路設計群組在財政年度內從業界所得收入共一千零六十萬港元，與去年比較大幅增長百分之二十。

Solid State Disk Controller SoC
固態硬盤控制器晶片

Solid State Disk Controller SoC is ideal for mass data storage in notebook computers
固態硬盤控制器晶片適用於筆記型電腦的大量數據儲存

Innovations
技術突破



Applied System-on-Chip Design (ASD) Laboratory
應用系統晶片設計實驗室

Applied SoC Design (ASD)

During the year, ASD continued providing solutions to satisfy customers' needs for high performance and low-power SoCs. The team achieved outstanding performances in the areas of customer service, storage and imaging.

In the customer service area, ICD's Common Platform for IP Qualification (CPIPQ) provided IP vendors, IP customers and IP evaluators a common standard for IP qualification. This platform can be applied to soft IP and hard IP qualification with semi-automated flow. It played an important role in the collaboration with IEEE for developing the P1734 standard for IP qualification.

Regarding imaging applications, ASD's 2D-to-3D converter offers real-time conversion from 2D contents. For example, it can convert 2D image from a Blu-ray player to commonly used 3D formats, such as Side-by-Side 3D. This converter offers a high quality, high efficiency and cost-effective means to achieve real-time 2D to 3D conversion. It can support a wide range of video input formats, up to Full HD resolution. The 3D output from the converter can be viewed on any 3D-ready display through the HDMI connection.

應用系統晶片設計

去年，ASD繼續提供解決方案，以滿足客戶對高性能及低功耗系統晶片的需求。ASD在客戶服務、存儲器及圖像處理上表現優異。

在客戶服務方面，集成電路設計群組的知識產權質量驗證通用平台（CPIPQ）項目為IP設計者、IP使用者及IP評估者提供了一個IP質量評測的通用平台。該平台使用半自動化流程對軟IP和硬IP進行質量評估。項目團隊還積極參與推動P1734成為IEEE IP質量驗證標準的工作。

在圖像處理應用方面，ASD開發的二維至三維轉換器提供實時二維內容轉換。例如它可以將來自藍光播放器的二維影像轉換為常用的三維格式，例如併排三維視頻格式。此轉換器提供了高質量、高效率及具成本效益的實時二維至三維轉換方法。它支持高達全高清解像度的多種視頻輸入格式。另外通過HDMI接口，其三維輸出可以在任何三維顯示器上播放。

Real-time 2D to 3D Video Converter
二維至三維實時視頻轉換器

Real-time 2D to 3D Video Converter
二維至三維實時視頻轉換器

Real-time 2D to 3D Video Converter supports up to 1080p conversion from multiple 2D sources including video game consoles, Blu-ray/DVD players, media players, digital cameras, video recorders and computers

二維至三維實時視頻轉換器支援包括電子遊戲機、藍光／DVD播放器、媒體播放器、數碼相機、錄影機和電腦的不同類型二維片源的三維轉換，畫質規格最高可達高清1080p

For applications with fast-changing images, ASD has an IC with integrated Frame Rate Up-Conversion (FRC) and local dynamic LED backlight control. This device reduces motion blur, enhances picture contrast and saves energy for LCD displays. Its FRC algorithm focuses on 60 fps (TV broadcast) to 120 fps conversion for the LCD TV market. Cadence detection is also included, enhancing the movie mode viewing experience.

In the storage area, ASD designed a universal USB 3.0 application processor architecture that can be used for storage, display and hub. ASD taped out the first test chip optimized for USB 3.0 flash drive based on 90 nm CMOS process. Mass production is planned in 2011 after some optimization work. In addition, ASD strengthened its High Performance Storage Controller (HPSC) platform which can be used in Solid State Disk (SSD) controller SoC design. By developing advanced algorithms and implementing them on the SoC, this technology offers dramatically higher data storage bandwidth over traditional Hard Disk Device (HDD).

Video streaming with USB 3.0 Application Processor
以USB 3.0應用處理器進行視頻轉播

此外針對快速移動影像，ASD將自主開發的幀率上變換（FRC）技術和LED動態背光控制功能整合在一塊晶片上，以達到減少動態模糊、增強圖像對比度以及節省液晶顯示器功耗的目的。ASD自主開發的FRC算法技術將幀率為60fps的電視廣播內容轉換成120fps，並應用於液晶電視市場。晶片中還加入了輸入視頻格式檢測技術以加強電影模式的觀看體驗。

在存儲方面，ASD設計了一種多用途的USB 3.0應用處理器架構，可用於存儲、顯示和集線器。基於90納米制程，ASD製造了第一塊USB 3.0閃存盤的測試晶片。經優化後已定於二零一一年量產。此外ASD加強了可應用於固態硬盤控制器SoC設計的高性能存儲控制器平台。通過研發先進算法並在SoC中實現，相對於傳統硬盤，這項技術可以為用戶大大提升數據存儲帶寬。

Portable Analog and Mixed Signal Design (PAD)

PAD made satisfactory progress in delivering analog and mixed signal IC design building blocks and design methodologies. Regarding power management for green energy, PAD completed micro-inverter prototype design for solar electric power generation applications, high-efficiency AC-DC converter for power supply and LED solid state lighting applications. Four patent applications were filed in the U.S. for these technologies with two already granted.

In the area of portable consumer products and communication, PAD developed 12 bit uW ultra-low energy SAR analog-to-digital converter in 0.18 µm and 65 nm CMOS. Four patent applications were filed in the U.S. for the technology with two already granted.

PAD also completed IP set for building a LCoS pico-projector system and filed one patent application in the U.S. In electrostatic discharge, PAD delivered 8KV ESD protection IP in CMOS and filed one patent application in the U.S. for the technology.

AC-DC Flyback LED Driver with built in protection features for over voltage and over current, ensuring safety and reliability for LED lighting applications
交流一直流反激式LED驅動器的內置保護功能如過壓及過流保護，為LED照明應用提供了安全可靠的解決方案

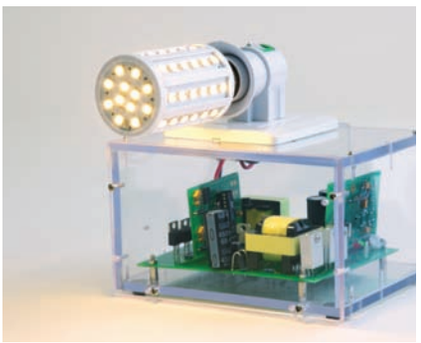
Optical Communication Circuit Design (OCD)

During the year, OCD completed preliminary design of a 10 G TIA and laser driver in 65 nm CMOS. It also finalized architecture of the 8-bit 56 G Analog-to-Digital Converter (ADC). The ADC uses an interleaved architecture containing 288 8-bit sub-ADCs, as well as an innovative time-skew calibration scheme.

USB 3.0 Application Processor
USB 3.0應用處理器

便攜式類比及混合訊號設計

PAD在提供類比及混合訊號的集成電路設計模組和設計方法上取得滿意進展。在綠色能源電源管理方面，PAD完成了應用於太陽能發電的微型逆變器的原型設計；用於電源的高效AC-DC轉換器和LED固態照明應用。PAD就有關技術在美國申請了四項專利，其中兩項已獲批。



Micro-inverter for solar power generation system
用於太陽能發電系統的微型逆變器

在便攜式消費及通訊產品方面，PAD已開發出12位0.18微米和65納米的CMOS微瓦級的超低功耗SAR模數轉換器。PAD就有關技術在美國申請了四項專利，其中兩項已獲批。

PAD完成構建矽基液晶微投影儀系統的全套知識產權，並就有關技術在美國提交了一項專利申請。在ESD方面，PAD交付了CMOS 8KV 的ESD保護知識產權，並就有關技術在美國提交了一項專利申請。

光通訊電路設計

過去一年，OCD團隊完成了一個65納米CMOS 10G互阻放大器和一個激光驅動器的初步設計。同時OCD亦完成了一個8位56G模數轉換器的基本結構。該模數轉換器使用一個先進的交錯架構，它包含了二百八十八個8位子模數轉換器以及一個創新的時間偏移校準設計。

USB 3.0 Application Processor
USB 3.0 應用處理器

USB 3.0 Application Processor supports super speed data transmission, read and write performances
USB 3.0 應用處理器支援超高速數據傳輸及讀寫性能

Commercialization
市場化

Applied SoC Design (ASD)

ASD has been working closely with customers on design, implementation and testing. ASD leveraged our customers' USB 3.0 expertise to speed up the whole development process of USB 3.0. During the year, the team built a demonstration board with the test chip and distributed it to potential customers for commercial evaluation. ASD customers helped commercialize this product through their connections.

ASD signed a contract to help customer develop a custom process for monitoring design. The fundamental knowledge of this custom IP came from the yield enhancement design platform of the Nanometer SoC Design Technology project.

In addition, ASD helped customers from Hong Kong, the Mainland and U.S. to develop their own SSD controller based on HPSC's platform. Customers can leverage ASTRI's technologies to improve their design performance as well as speed up the entire development cycle time. ASD provided technical consultancy to assist them in setting up the IC development and verification environment.

ASD also helped customers implement ASTRI's advanced algorithm for improving SSD performance and reliability in firmware. Through ASTRI's FPGA verification platform, customers can develop their hardware design and verify its functionalities quickly.

應用系統晶片設計

ASD一直在設計、實施和測試上與客戶緊密合作。ASD運用客戶在 USB 3.0 方面的專業知識，加快了整個 USB 3.0 項目的開發過程。年內，團隊建構了一塊包含測試晶片的演示板，並交給潛在客戶作商業評估。客戶們通過他們在業界的聯繫，加速了產品的商業化。

ASD已跟業界簽訂服務合約，協助客戶在設計上自定過程監控。此自定IP的基本認知，來自納米系統級晶片設計技術項目的產量提高設計平台。

此外ASD協助來自於香港、中國內地以及美國的合作夥伴開發基於HPSC平台的SSD控制器晶片。客戶可以利用應科院的技術來提升他們的設計，並加速整個開發周期。ASD提供技術諮詢，協助客戶建立IC開發及驗證環境。

ASD同時幫助客戶開發固件，以實現提高性能和增強穩定性的先進算法。基於應科院的FPGA驗證平台，客戶可以更有效地進行硬件設計和驗證。

Portable Analog and Mixed Signal Design (PAD)

PAD successfully delivered all analog IPs to its partner, CREDO Semiconductor Inc., a start-up company from Silicon Valley, for implementation of the integrated 10 GbE PHY.

PAD launched an ICP with a leading RF power amplifier manufacturer. A family of RF power amplifiers is being developed for the mobile phone market.

PAD successfully delivered IP for LCoS pico-projector chip set. It worked with one of the world's largest CMOS image sensor manufacturers to develop Asia's first LCOS imager and support chip. A functional imager chip has been delivered to customer.

Regarding Analog Front End (AFE) for MEMS sensor applications, PAD signed collaboration agreements with a leading company on the Mainland to co-develop MEMS based micro-bolometer ROIC for high resolution IR cameras. PAD also worked with a key customer in Taiwan to develop an AFE for their multi-axis mobile phone micro-accelerometer ASIC.

Currently, PAD is collaborating with one of the largest silicon foundries on the Mainland to develop advanced ESD protection IPs for their 65 nm and 45 nm CMOS processes.

便攜式類比及混合訊號設計

PAD成功為合作夥伴科睿通半導體（香港）有限公司，一家總部設在美國矽谷的公司，交付了實現10GbE PHY集成的所有類比知識產權。

PAD與一家領先的射頻功率放大器製造商開展了一個業界合作項目，為手機市場研發一系列射頻功率放大器。

PAD成功交付LCoS微型投影機全套晶片的知識產權。PAD與全球最大的CMOS圖像傳感器製造商，開發亞洲第一的LCOS成像晶片和支持晶片。一個功能齊備的成像晶片已成功交付給客戶。

在類比前端的MEMS傳感器應用方面，PAD與國內一家領先公司簽署了合作協議，共同為高解像度紅外線攝像機而開發出基於微機電系統的集成電路。同時PAD亦與台灣一個重要客戶共同開發多轉軸手機微加速度計專用集成電路的類比前端。

目前，PAD正與中國內地最大的晶圓代工廠合作開發先進的65納米和45納米的CMOS工藝ESD保護知識產權。

Future Development
未來發展

Applied SoC Design (ASD)

ASD will further develop and strengthen its technologies in USB 3.0 Super Speed, display enhancement and high-speed SSD storage. ASD is also committed to carry out new R&D projects in IC technologies for healthcare systems and a seed project is expected to commence soon. Meanwhile, ASD will continue emphasizing commercialization of its R&D deliverables.

Portable Analog and Mixed Signal Design (PAD)

PAD plans to expand its current core analog and mixed signal technologies "vertically" into advanced processes and add initiatives to broaden its technology capability. For example, PAD will enhance its technology expertise in areas such as high-speed, low-power chip-to-chip communication links, as well as low-power RF and DSPs. Researchers with capabilities in application, system and software will be recruited, enabling the team to offer IP-protected, value-added total solutions to customers based on ASTRI's existing "point-to-point" IP licensing scheme.

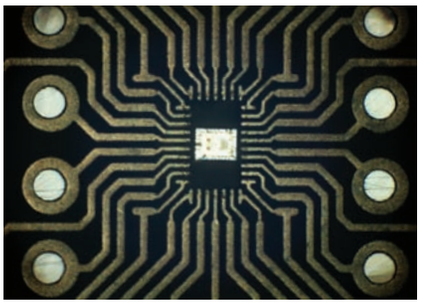
Optical Communication Circuit Design (OCD)

Meanwhile, OCD will expand its R&D efforts to address 40 G and 100 G multiplexer and demultiplexer applications.

USB 3.0 Application Processor for storage, display and hub
用於儲存、顯示和集線器的USB 3.0應用處理器

應用系統晶片設計

ASD將繼續開發及強化在超高速 USB 3.0、增強顯示和高速固態硬盤存儲方面的技術，同時也會積極開拓醫療系統IC研發的新領域，預料一個種子項目即將會展開。另外ASD將會繼續努力進行研發成果的產業化工作。



Ultra-low Energy Data Converter is ideal for battery-powered consumer electronics, medical equipment and sensor network
超低功耗數據轉換器適用於以電池供電的電子消費品、醫療設備及傳感網絡

便攜式類比及混合訊號設計

PAD計劃擴大目前的類比及混合訊號核心技術，以「垂直」式進入先進工藝過程，並努力創新，以擴大PAD的技術能力。例如PAD會強化自身的技術專長－高速低功耗晶片與晶片之間的聯繫通訊；低功耗射頻和數碼訊號處理。PAD亦將會增聘在應用、系統及軟件方面的人才加入研發團隊，從而使PAD能夠在應科院的點對點IP授權方案的基礎上，為客戶提供具知識產權保護及增值的全面解決方案。

光通訊電路設計

OCD會將其研發工作擴展到40G和100G多工器和訊號分離器的領域。

Project Highlights
研發項目

		Project 項目	Duration 時期
		Applied SoC Design 應用系統晶片設計	
1	P	Nanometer SoC Design Technology 納米系統級晶片設計技術	May 2009 – Feb 2011 二零零九年五月至二零一一年二月
2	P	High Performance Storage Controller Platform 高性能存儲控制器平台	May 2009 – Dec 2010 二零零九年五月至二零一零年十二月
3	P	Common Platform for IP Qualification 知識產權質量驗證通用平台	Sep 2009 – Nov 2010 二零零九年九月至二零一零年十一月
4	I	Multi-role Configurable USB 3.0 Application Processor 多角色可配置 USB 3.0 應用處理器	May 2010 – May 2012 二零一零年五月至二零一二年五月
5	P	LCD TV Display Enhancement Controller 液晶電視顯示增強控制器	Jun 2010 – Feb 2012 二零一零年六月至二零一二年二月
6	P	SSD Controller SoC with Super Speed USB 3.0 USB 3.0固態硬盤控制器晶片	Nov 2010 – May 2012 二零一零年十一月至二零一二年五月
7	I	Mobile Multimedia Application Processor 移動多媒體應用處理器	Jan 2011 – Jan 2013 二零一一年一月至二零一三年一月
		Portable Analog and Mixed Signal Design 便攜式類比及混合訊號設計	
8	I	10 Gigabit Ethernet Silicon IP Platform 10千兆位數據率以太網矽IP平台	Apr 2009 – Oct 2010 二零零九年四月至二零一零年十月
9	P	High Voltage Motor Driver Silicon IP Platform 高壓電動機驅動器矽IP平台	Jun 2009 – Dec 2010 二零零九年六月至二零一零年十二月
10	P	ESD Design and Device Modelling ESD設計與器件模型	Jul 2009 – Mar 2011 二零零九年七月至二零一一年三月
11	S	AC-lined LED Driver Lighting Solutions 交流電發光二極管照明電源控制器	Jan – Jun 2010 二零一零年一月至六月
12	P	Ultra-low Energy Analog-to-Digital Converter Technologies 超低功耗模數轉換器	Feb 2010 – Aug 2011 二零一零年二月至二零一一年八月
13	P	Integrated LCoS Imager IP Development for Pico-projectors 應用於微型投影儀的矽基液晶集成影像晶片的IP開發	Mar 2010 – Nov 2011 二零一零年三月至二零一一年十一月
14	I	Radio Frequency Power Amplifiers using Gallium Arsenide Hetero-Junction Bipolar Transistors 使用砷化鎵異質結雙極型電晶體管研發的射頻功率放大器	May 2010 – May 2012 二零一零年五月至二零一二年五月
15	S	Micro-inverter used in Solar Photovoltaic System 適用於太陽能發電系統的微型逆變器	Jul – Dec 2010 二零一零年七月至十二月
16	P	Advanced AC-DC Power Conversion Platform for LED SSL 先進的交流轉直流LED照明方案	Nov 2010 – May 2012 二零一零年十一月至二零一二年五月
		Optical Communication Circuit Design 光通訊電路設計	
17	S	High-speed Integrated Circuits for Optical Fibre Communication 光纖通訊適用的高速集成電路	Feb – Aug 2010 二零一零年二月至八月
18	P	High-speed Integrated Circuits for Optical Fibre Communication 光纖通訊適用的高速集成電路	Nov 2010 – Nov 2012 二零一零年十一月至二零一二年十一月

P Platform Project 平台項目

S Seed Project 種子項目

I Industry Collaborative Project 業界合作項目

Material & Packaging Technologies Group
材料與構裝技術群組

We will forge further ahead to develop green, patent protected and ready for mass production technologies and related applications to benefit industry and improve the environment in Hong Kong and the Mainland.
我們會繼續致力開發環保、受知識產權保護及可量產的材料和構裝技術及相關應用產品，以改善環境，為香港和內地的相關產業作出貢獻。

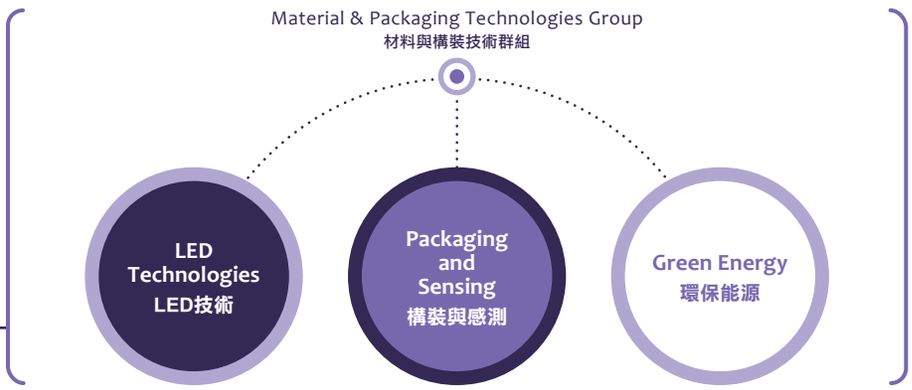
Dr. Wu Enboa 吳恩柏博士
Vice President and Group Director
Material & Packaging Technologies Group
材料與構裝技術群組 副總裁及研發群組總監

The Material & Packaging Technologies (MPT) Group was established in 2005 to develop customer-focused technologies and product solutions. The Group has laid a solid foundation for Hong Kong and the Mainland to become a major centre for designing and manufacturing next generation key components, unique devices and fully functional systems for worldwide information and communication technology industries.

MPT has launched five key technology initiatives to meet the needs of industries. They are Display Systems, LED Lighting, Advanced Packaging Technologies, Photonic Components and Device Fabrications. MPT has established solid platform expertise for these initiatives and has been making significant technological and commercial impacts on the following areas:

材料與構裝技術群組自二零零五年成立至今，一直致力研發以顧客為導向的技術及產品方案，為打造香港和中國內地成為全世界資訊通訊技術行業所需的新一代關鍵元件、器件、系統的設計和製造中心奠定了堅實的基礎。

為滿足業界需要，群組訂立了五個主要科研方向—顯示系統、LED照明、先進構裝技術、光電子元件和器件研製。群組已就該些重點科研方向建立了穩固的專業技術平台，為以下幾個領域提供重要的技術支援，推動商業發展：



During the year, MPT filed 52 patent applications including 19 in the U.S., while 38 patents were already granted including 25 U.S. patents. These patented technologies were licensed to companies in Hong Kong and the Mainland on 28 occasions and were turned into actual applications.

In commercialization, MPT signed 28 contracts with 27 companies this year, including one exclusive licensing contract leading to the setting up of a start-up in Hong Kong Science Park for compact optical anti-shaking camera modules. In addition, MPT also signed a five-year industry contract with a Mainland company for developing data processing solution for high-speed trains. MPT received in total HK$14.7 million income from industry during the year 2010/11.

群組在本年度共申請了五十二項專利，包括在美國申請的十九項專利；另外共有三十八項專利獲得授證，當中包括二十五項美國專利。該些技術在年內透過二十八次技術授權轉讓予香港和中國內地的公司作實際商業應用。

在技術商業化方面，群組在本年度與二十七家公司簽署了二十八份技術轉移合約，包括一項獨家授權，促成一家經營微型光學防震照相機模組的新公司在香港科學園成立。此外，群組和國內一家公司簽署了一份為期五年的合作協議，合作研發用於高鐵的通訊系統。本年度群組從業界獲取收入達一千四百七十萬港元。

Researchers carrying out tests on thermal reliability measurement and analysis
研究員在進行熱可靠性測量與分析

LED lamps incorporating ASTRI's patented "birdcage" heat convection technology are sold in more than 400 retail outlets worldwide
融合應科院「鳥籠」導熱專利技術的LED射燈在全球超過400間零售店出售

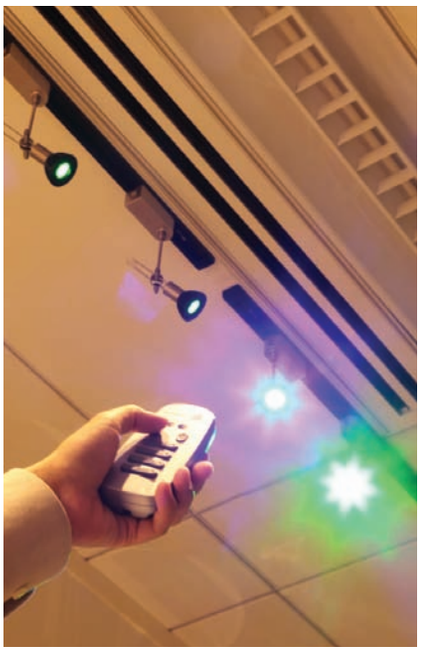
Patents Filed 專利申請數目	52
Patents Granted 獲批專利數目	38
Contracts Signed 與業界簽訂合約數目	28
*Income Received from Industry *業界收入	14.7

*Including cash and in-kind contribution 包括現金及物資資助

LED Street Lamp
LED 路燈

Street lamps powered by ASTRI's LED technology are installed on a main road in the Hong Kong Science Park
以應科院技術開發的LED路燈安裝於香港科學園一條主要道路上

Innovations
技術突破



ASTRI's intelligent LED Lighting Control System
應科院的智能LED照明控制系統

LED Technologies

The seven technology platforms described below were developed and 95 patent applications were pending or granted in the U.S.

A novel chemical mechanical polishing process for removing sapphire substrate of vertical structured high-power LED chip was developed to attain the best thermal management, as well as to obtain the lowest reversed bias current in the vertical LED chips. A total of eight patent applications were filed in the U.S. for the technology and two of them were granted. Product prototypes from this technology received the Product Innovation Award in 2010 SSL National Contest on the Mainland.

The world's smallest LED flash module of 8x11x4 mm^3 was developed using wafer-level system-in-package technologies. Three patent applications were filed in the U.S. The module's outstanding and uniformed exposure features significantly enhance the quality of captured pictures in mobile phones. This new technology offers industry a cost competitive solution.

LED技術

團隊已開發以下七個技術平台，九十五項美國專利申請已獲授證或正在審理中。

團隊開發出獨特的化學機械拋光法，在垂直結構LED器件製造過程中去除藍寶石襯底，以獲得最理想的散熱效果，同時大幅提升垂直結構LED器件的逆向電流的良率。團隊已就該技術在美國提交了八項專利申請，其中兩項已獲授證。該技術在二零一零年中國「南海杯國家半導體照明創新大賽」中獲得「產品創新獎」。

團隊利用晶圓級LED系統構裝技術開發了全球最小、體積只有8x11x4mm^3的LED閃光燈模組。團隊已為該技術在美國提交了三項專利申請。此LED閃光燈模組可以提供優異的光亮度及均光性，有效提升手機相機的影像素質。此先進技術為業界提供了一個具成本競爭優勢的方案。

受專利保護的LED室內照明系列的延伸產品，包括MR16、PAR38、E27及走廊燈等整套產品組合，有助企業夥伴進入環保照明市場。團隊已就該技術獲得三項美國專利，另有三項美國專利申請在審理中。

Product extension of the patent-protected LED indoor lamp series including MR16, PAR38, E27 and bulkhead (corridor) lamps offered industrial partners full product portfolios to enter the green lighting market. Three U.S. patents were granted and three applications were pending.

LED wireless lighting control using ZigBee and microwave sensor module was developed, allowing digital control of lighting by users in different application scenarios.

The world's first compact 3D LED pico-projector was demonstrated at the Projection Summit 2010 in Las Vegas. The demonstration attracted the attention of Japan Nikkei Electronics to give a report. The product prototype received the Product Innovation Award in the 2010 SSL National Contest on the Mainland.

Thin direct LED-BLU technology using first-optics lens can reduce the light mixing distance of existing version by 50 per cent or more. Novel local dimming control system for both edge-lit and direct-lit LED backlight TV was realized. More than 30 patent applications were filed in the U.S. regarding this development.

Low-cost optical multi-touch technology with novel optical structure was developed to resolve multiple simultaneous touch inputs. Five patent applications were filed in the U.S. for this technology.

Mobile phone flash light based on Wafer Level LED System-in-Package (SiP) Technology
採用晶圓級LED系統構裝技術的手機閃光燈

團隊開發出無線照明控制，透過附有微波感測功能的LED無線照明控制模組，讓用家可利用數碼控制來調校出配合不同情景的照明效果。

ASTRI-developed PAR38 LED lamp
應科院開發的PAR38 LED射燈

全球首台微型三維投影機在美國拉斯維加斯舉行的 Projection Summit 上展出，並得到日本電子技術網站 Japan Nikkei Electronics 的特別報導。該投影機在二零一零年中國「南海杯國家半導體照明創新大賽 」 中獲得「產品創新獎」的殊榮。

採用一次光學構裝LED元件設計的薄型化直下式LED背光技術可有效降低百分之五十或以上的混光距離。新型區域動態控制系統可針對LED直下式背光和LED側光式背光實現。團隊就有關技術在美國提交超過三十項專利申請。

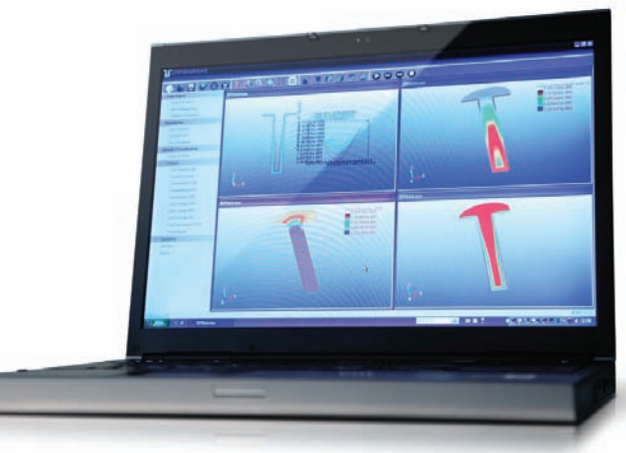
團隊已開發出具有新型光學結構的低成本光學式多點觸摸技術，可以準確地分辨多個同時輸入的觸摸點。團隊為該技術於美國提交了五項專利申請。

The World's Smallest Auto-focus Camera Module
全球最小自動對焦照相機模組

The world's smallest auto-focus camera module for portable consumer electronics, measuring only 5.1X5.6X4.8 mm³
用於便攜式消費電子產品，全球最小的自動對焦照相機模組，其體積只有 5.1X5.6X4.8 mm³

Packaging and Sensing Technologies

The six technology platforms detailed below were developed and 57 patent applications were pending or granted in the U.S.



Design software for TSV electroplating process development
用於矽通孔電鍍工藝研發的設計軟件

A fully functional Tyre Pressure Monitoring System (TPMS) embedded with a SiP module (integrating MCU, RF and MEMS chips), an antenna and a receiver module was developed and field tests were passed. MPT has three patent applications filed in the U.S. for the technology with one already granted.

A new software tool including a powerful calculation engine, user-friendly interface and multi-functional result visualization modules was developed. Modelling and simulation of key Through-Silicon-Via (TSV) manufacturing process including via-fabrication, via-filling and wafer thinning were successfully demonstrated to industry. A total of eight patent applications were filed in the U.S. with one already granted.

A polymer-based TSV-CIS module in eight inches wafer format was developed. It passed the JEDEC tests with high manufacturing yield (>90 per cent) and low manufacturing cost (20 per cent lower) compared with the most advanced design found in the market. Two patent applications were filed in the U.S. for the technology.

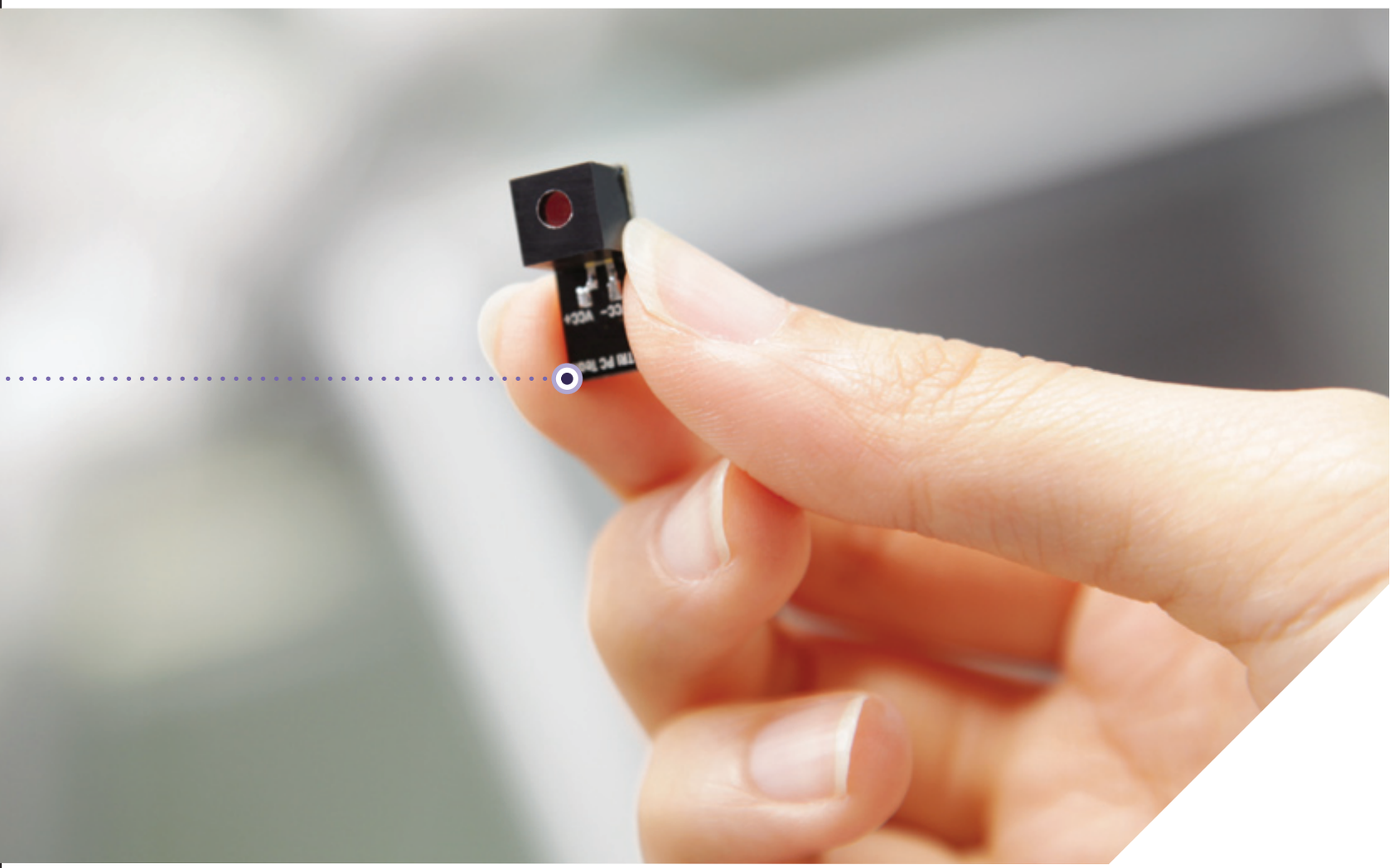
構裝與感測技術

團隊已開發以下六個技術平台， 五十七項美國專利申請已獲授證或正在審理中。

團隊已成功開發整套胎壓監測系統技術，包括一個系統級構裝模組（集成微控制器、射頻和微機電系統晶片）、一支天線和一個接收模組。該系統已成功通過了汽車實地測試。團隊已就有關技術在美國申請了三項專利，其中一項已獲授證。

團隊成功開發並向業界演示一套可以模擬和仿真主要矽通孔製造過程，包括矽孔製作、矽孔填充和晶圓減薄的軟件工具。該軟件包括一套功能強大的計算引擎、一個用戶友好操作介面和一套多功能結果演示模組。團隊已就該技術在美國申請了八項專利，其中一項已獲授證。

團隊已成功開發基於聚合物絕緣的矽通孔CMOS圖像傳感器八吋晶圓樣品。該技術已通過JEDEC驗證，製造良率提高到百分之九十以上，相對市場上現有的最先進產品而言，製造成本也有效地降低了百分之二十。團隊已就有關技術在美國申請了兩項專利。



Engineering samples of both optical and signal-processing sub-modules used for composite healthcare monitoring functions such as pulse oximetry, heart rate and physical fitness were designed, manufactured and calibrated. Subsequently they passed reliability and EMI/EMC tests. They can be further integrated into various consumer healthcare electronic products.

Two of the world's smallest compact camera modules were developed - one is the optical anti-shaking camera module measuring 8.5x8.5x6.8 mm^3, and the other is the auto-focus module of 5.1x5.6x4.8 mm^3 (1.3M). A total of four U.S. patents were granted out of 14 applications filed for the development.

The first Hong Kong-developed MEMS ink jet head named "China Head" was configured between 424 dpi and 600 dpi with a print swath of up to 0.5 inches, including 299 nozzles for wide format printing and printed electronics. The China Head is 50 per cent faster in printing throughput than comparable commercial print heads.

具有綜合保健監測功能，如血氧飽和度、心率和體能狀態的光學與訊號處理模組，其工程樣品的設計、製造和校準已完成。此樣品也通過了可靠性和EMI／EMC測試，可以進一步整合到各種消費保健電子產品中。

團隊已成功開發了兩款全球最小的照相機模組，分別是體積為8.5x8.5x6.8mm^3的光學防震照相機模組和體積為5.1x5.6x4.8mm^3（1.3百萬像素）的自動對焦照相機模組。團隊就有關技術申請了十四項美國專利，其中四項已獲授證。

團隊已成功開發香港第一台微機電技術噴墨打印噴頭，取名為「中國頭」。其解析度規格由424DPI至600DPI，最大列印長度可達半吋，利用二百九十九顆噴頭可實現寬幅噴印及應用於印刷電子。此外「中國頭」的噴印速度比同等規格的噴頭速度快百分之五十。

ASTRI's Tyre Pressure Monitoring System contains a SiP solution integrating MCU, RF and MEMS sensor
應科院開發的胎壓監測系統，包含集成了微控制器、射頻和微機電傳感器的系統級構裝方案

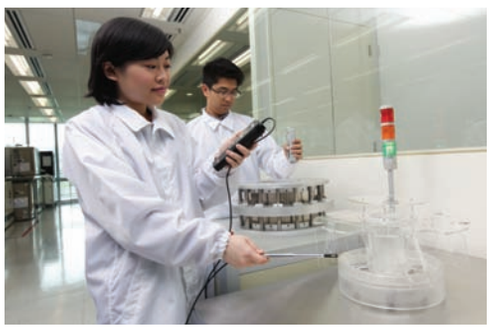
Green Energy Technologies

An optical design of 1,000 suns concentrator for concentrating photovoltaic (CPV) module was developed. The concentrator's optical efficiency and module efficiency can achieve up to 85 per cent and 25.4 per cent respectively. Two patent applications were filed in the U.S.

Advanced anode material developed by MPT's lithium-ion battery team passed the auto-fab-line battery fabrication process and reached the power density specification of 240 W-hr/kg.

A novel electro-magnetic generator using a unique "ferrofluid bearing" demonstrates quick-start capability. It is intended for use in gusty, lower wind speed environment in Hong Kong. Two patent applications were filed in the U.S.

Wind Energy Harvesting Capability Measurement and Analysis
風能採集性能測量與分析

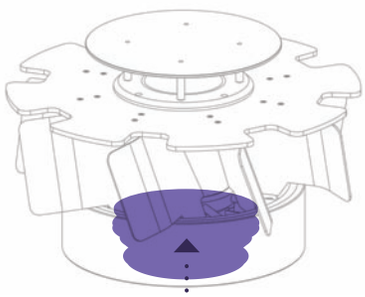


環保能源技術

團隊開發出用於一千倍聚光倍數CPV模組的聚光器光學設計。該聚光器的光能轉換效率可高達百分之八十五，而CPV模組的光伏轉換效率可達百分之二十五點四。團隊就該技術在美國申請了兩項專利。

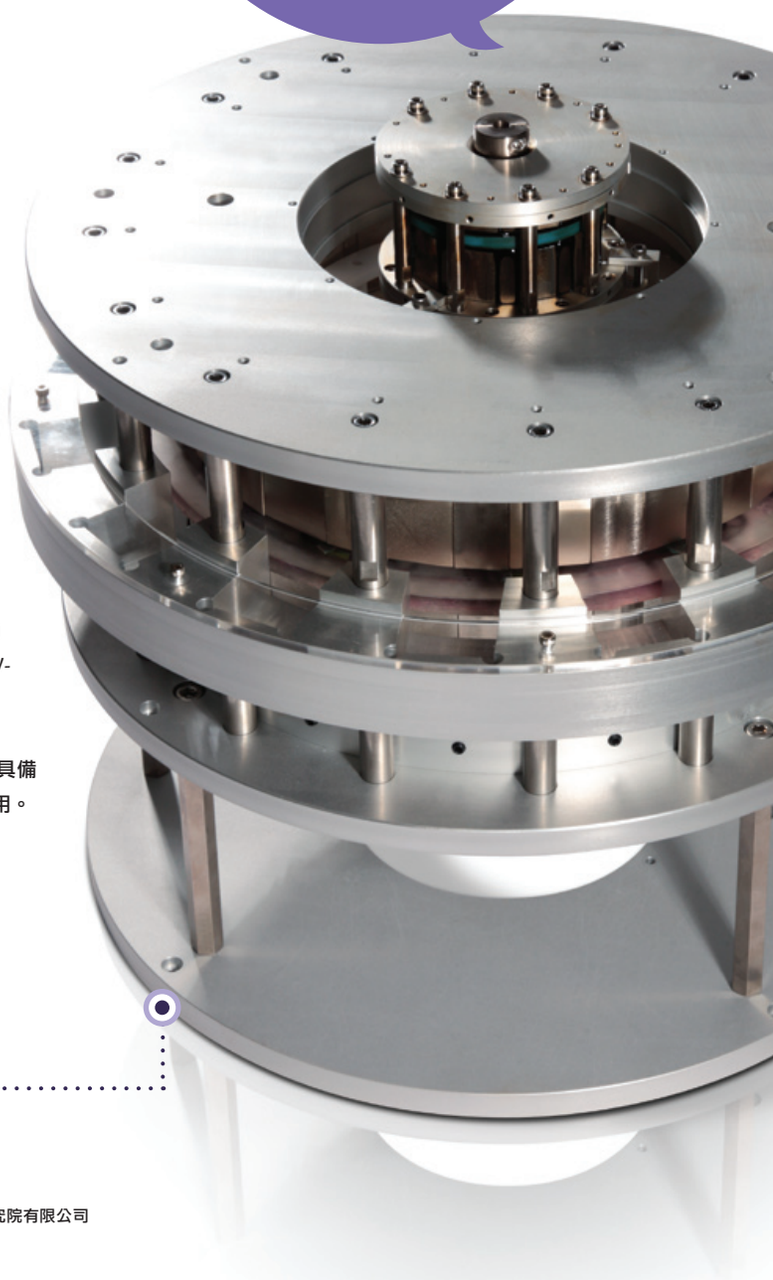
由團隊的鋰離子電池小組所開發的先進電池電極材料，已通過了自動化生產線的工藝評估，功率密度規格可達到240W-hr/kg。

團隊成功開發出採用磁流體軸承技術的電磁式發電機，它具備快速啟動能力。此發電機適合在香港這類低風速環境下使用。團隊已就該技術在美國申請了兩項專利。



Novel Concentrated Wind Charger
聚風式充電器

ASTRI's novel Concentrated Wind Charger embedded with patented design of Ferrofluid Bearings integrated electro-magnetic generator
由應科院創新研發，應用磁流體軸承專利設計的發電機組成的聚風式充電器



Commercialization
市場化

LED Technologies

Sixteen contracts for technology transfers were signed during the year, bringing the total number of transfers to 58 since 2005.

LED技術

團隊於本年度簽署了十六份技術轉移合約，由二零零五年起共簽訂五十八份技術轉移合約。

MR16 LED Lamps
MR16 LED 射燈

MR16 LED lamps developed by ASTRI bring greener living
應科院開發的MR16 LED 射燈帶來更環保的生活

LED street lamps were installed in Hong Kong and seven major cities on the Mainland, including Shenzhen, Guangzhou, Dalian, Xianyang, Changzhou, Changshu and Shouguang.

LED路燈已安裝於香港及內地七個主要城市，包括深圳、廣州、大連、咸陽、常州、常熟和壽光。

MPT's LED lighting team collaborated with various government departments and public utilities such as the Highways Department, Housing Department and Hong Kong Science Park on trial use of LED lighting, including LED street lamps, LED MR16 lamps and LED corridor lamps. The four U.S. patent protected LED spot lamps are being sold in more than 400 shops worldwide.

LED照明團隊與香港政府部門及公共機構如路政署、房屋署及香港科學園等合作，展開LED燈具的試用計劃，包括LED路燈、LED MR16射燈和LED走廊燈等。現時獲四項美國專利保護的LED射燈，已在全球超過四百家商店銷售。

MPT's wireless lighting control technology was licensed to four companies for developing digitally controlled LED-based indoor lighting for better lighting quality and further energy saving.

團隊開發的無線燈控技術已授權予四家公司，發展以數碼控制的LED室內照明，可提高照明質量及節省能源。

Three different versions of pico-projectors were licensed by three manufacturers in Hong Kong and the Mainland for mass production.

三種機型的微型投影機已經授權給香港和內地的三家廠商以進行量產。

Active dynamic LED backlight solution was licensed to nine Hong Kong and Mainland companies including several internationally known tier-1 LED packaging companies, Mainland TV companies and public information displays (PIDs) companies.

主動式動態LED背光控制方案已授權給九家香港和內地的公司，包括幾家國際知名的一線LED構裝廠、內地電視機品牌商和公共顯示系統公司。

LED MR16 Lamps
LED MR16 射燈

Packaging and Sensing Technologies

Twelve contracts for technology transfers were signed during the year, bringing the total number of technology transfers to 57 since 2005.

The via-filling and wafer-thinning simulation modules of MPT's new software tool were licensed to two companies in Hong Kong and the Mainland for commercialization.

Tyre Pressure Monitoring System (TPMS) including four sensors and one receiver module were licensed to a tier-1 semiconductor manufacturer on the Mainland for mass production.

The technology of optical and signal-processing sub-modules for pulse oximetry, heart rate and physical fitness monitoring was licensed to a tier-1 mobile phone manufacturer on the Mainland. Pilot run was completed by the manufacturer.

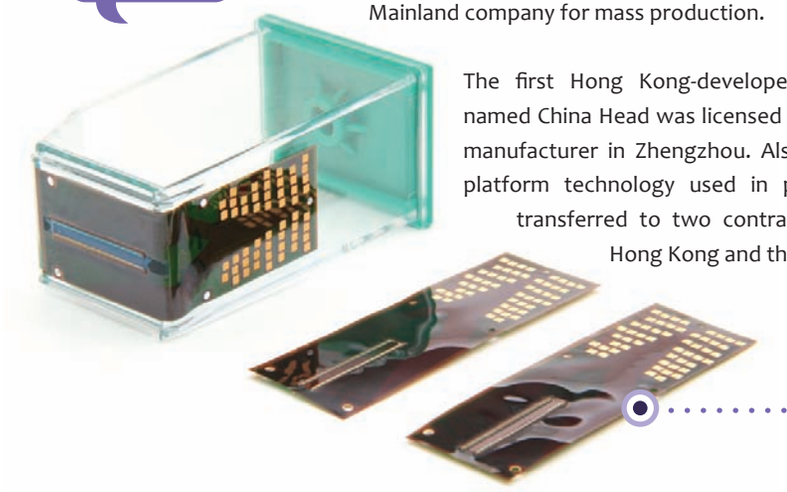
System-in-packaging technology developed by MPT earned the trust of a Mainland IC design company resulting in a five-year contract aimed at enhancing train safety from collision and improving mobile phone communication quality for China's high-speed train applications.

The membership increase of the Advanced Packaging Technologies Consortium (APTC) from 33 to 39 reflected that the exchange platform provided by APTC was very well received by supply chain companies in the advanced packaging industry.

In September 2010, the R&D team developing the anti-shaking camera module was spun off from MPT. A new company for manufacturing and marketing the novel module was formed in Hong Kong Science Park. Eight U.S. patents were licensed to the startup. VCM-based 3D anti-shaking camera module was also licensed to a Mainland company for mass production.

The first Hong Kong-developed MEMS ink jet head named China Head was licensed to a wide-format printer manufacturer in Zhengzhou. Also, the ASTRI-developed platform technology used in printed electronics was transferred to two contract service customers in Hong Kong and the Mainland.

China Head
中國頭



構裝與感測技術

團隊於本年度簽署了十二份技術轉移合約，由二零零五年起共簽訂五十七份技術轉移合約。

團隊所開發的軟件工具，包括矽通孔填充和晶圓減薄工藝過程模擬和優化模組，已成功授權予兩家在香港和內地的公司作商業應用。

包括四個傳感器及一個接收器模組的胎壓監測系統，已授權予一家內地知名的一線半導體生產商進行量產。

用於監測血氧飽和度、心率和體能狀態的光學和訊號處理技術，已授權予一間內地一線的手機生產商應用，並已完成了產品評估。

群組與內地一家集成電路設計公司就團隊開發的系統級構裝技術簽訂五年合約，共同開發列車防碰撞安全措施及提高高鐵車廂中手機通訊質量，目標是將這些技術應用在中國高鐵。

先進構裝技術聯盟的會員數目已由三十三增至三十九名，反映出該聯盟為先進構裝業供應鏈內的公司提供的技術交流平台受到業界歡迎。

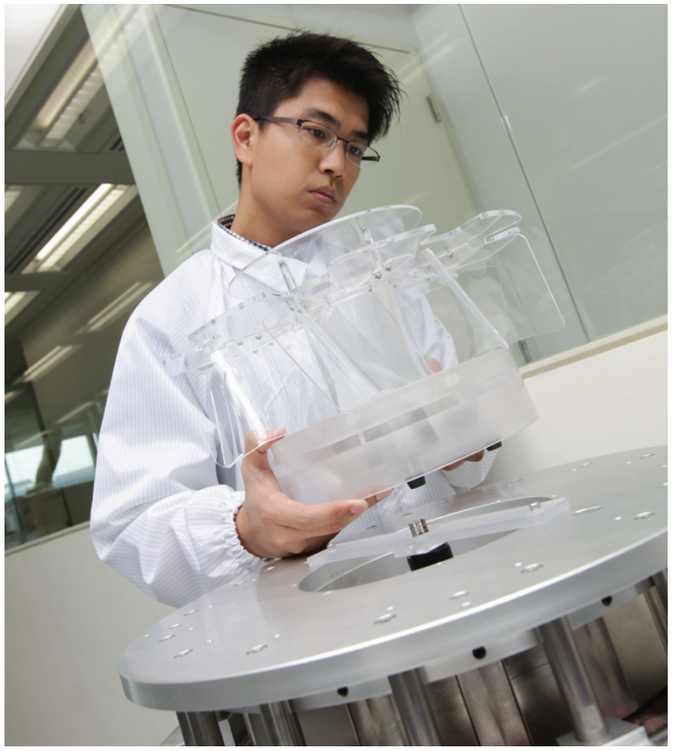
二零一零年九月，群組內負責研發防震照相機模組的團隊分拆成為獨立公司。該團隊於香港科學園成立了一家新公司，專門生產和銷售新型防震照相機模組。群組已將八項美國專利授權予該公司使用。此外以音圈馬達為基礎的三維防震照相機模組，已授權予一家內地公司以進行量產。

由本地開發的第一台微機電技術噴墨噴頭，名為「中國頭」的專利技術，已成功授權給中國鄭州的一家寬幅印表機製造商。另外，可用於噴印電子的平台技術以合約服務形式已成功轉移到兩家在香港和內地的客戶。

China Head
中國頭

"China Head" - the first ASTRI-developed MEMS inkjet print head
由應科院開發的第一部名為「中國頭」的微機電技術噴墨列印頭

Future Development
未來發展



Researchers measuring wind energy harvesting capability and analysis
研究員在進行風能採集性能測量與分析

In the coming year, MPT targets at developing and delivering innovative solutions with respect to the following applications:

- Panel-level LED packaging;
- Intelligent lighting control system for energy saving purpose;
- Phosphor printing for improved LED packaging process;
- 3D and mobile interactive pico-projectors;
- Intelligent and interactive displays;
- Multi-touch/gesture detection and recognition in display systems;
- Intelligent audience analysis in digital signages;
- Further development of TSV software;
- High optical efficiency CMOS image sensor module of novel structure;
- Modularized ubiquitous healthcare electronics units;
- Miniature optical zoom camera modules for mobile phones;
- Concentrated photovoltaic modules for portable power supply applications;
- Ferrofluid bearing design for ultra-slow wind turbine applications;
- Advanced lithium-ion battery electrode material architecture design; and
- Implementation of stationary Fuel Cell system solution.

在未來一年，材料與構裝技術群組的目標是開發和提供下列創新應用技術方案：

- 面板級LED構裝技術；
- 以節能為目標的智能照明控制系統；
- 用於提升LED構裝效率的螢光粉印刷技術；
- 三維及互動微型投影機；
- 智能及互動顯示器；
- 顯示系統中的多點觸控／手勢感測及識別技術；
- 應用於電子告示板的智能觀眾分析技術；
- 矽通孔軟件的進一步發展；
- 基於新穎架構的高光學效率CMOS圖像傳感器模組；
- 無處不在的模組化醫療保健電子裝置；
- 用於手機上的微型光學變焦相機模組；
- 適用於移動電源應用的聚光式光伏電池模組；
- 適用於低風速風電機的磁流體軸承設計；
- 先進鋰離子電池電極材料結構設計；及
- 固定式燃料電池系統方案的實施研究。

Project Highlights
研發項目

		Project 項目	Duration 時期
		LED Technologies LED技術	
1	P	Pico-projector 微型投影機	Mar 2009 – Jun 2010 二零零九年三月至二零一零年六月
2	P	Touch and Multi-touch Sensing System 觸控與多重觸控系統	Dec 2009 – May 2011 二零零九年十二月至二零一一年五月
3	P	Intelligent Audience Analysis 智能觀眾分析	Mar 2011 – Aug 2012 二零一一年三月至二零一二年八月
4	P	Wafer-level LED System-in-Package (SiP) 晶圓級 LED 系統級構裝	Nov 2009 – May 2011 二零零九年十一月至二零一一年五月
5	S	LED Street Lamp Deployment on Public Roads in Hong Kong 香港公共道路上的 LED 路燈部署	Jun – Dec 2010 二零一零年六月至十二月
6	S	LED Lamp for Corridor Lighting Application 應用於走廊照明的 LED 燈	Feb – Aug 2011 二零一一年二月至八月
7	S	Intelligent Sensing Lighting Control Module 智能感測照明控制模組	Feb – Aug 2011 二零一一年二月至八月
8	P	Integrated Vertical LED Technology 集成垂直 LED 技術	Feb 2010 – Aug 2011 二零一零年二月至二零一一年八月
		Packaging and Sensing Technologies 構裝與感測技術	
9	I	Tyre Pressure Monitoring System 胎壓監測系統	May 2008 – Jan 2011 二零零八年五月至二零一一年一月
10	P	Reliability Engineering for 3D-Packaging 三維構裝的可靠性工程	Sep 2008 – Jun 2010 二零零八年九月至二零一零年六月
11	P	Modularized Ubiquitous Healthcare Electronics 無處不在的模組化醫療保健電子	Nov 2010 – May 2012 二零一零年十一月至二零一二年五月
12	P	TSV-based CMOS Image Sensor 基於矽通孔的 CMOS 圖像傳感器	Dec 2010 – Nov 2012 二零一零年十二月至二零一二年十一月
13	P	Wafer-level Chip Scale Actuator 晶圓級相機驅動器	Mar 2010 – Aug 2011 二零一零年三月至二零一一年八月
14	P	MEMS Ink Jet Head for Wide-format Printing 用於寬幅印表機的噴墨印表頭	Aug 2010 – Jul 2012 二零一零年八月至二零一二年七月
		Green Energy Technologies 環保能源技術	
15	P	Concentrated Photovoltaic Modules 聚光式光伏電池模組	Nov 2010 – Nov 2012 二零一零年十一月至二零一二年十一月
16	P	Piezo-based Energy Harvester 壓電式能量採集	Jan 2010 – Oct 2011 二零一零年一月至二零一一年十月
17	S	Concentrated Wind Charger 聚風式充電器	Jul – Dec 2010 二零一零年七月至十二月
18	P	Next Generation Anode Material for Li-Ion Batteries 新一代鋰電池陽極材料	Nov 2008 – Oct 2010 二零零八年十一月至二零一零年十月

P Platform Project 平台項目

S Seed Project 種子項目

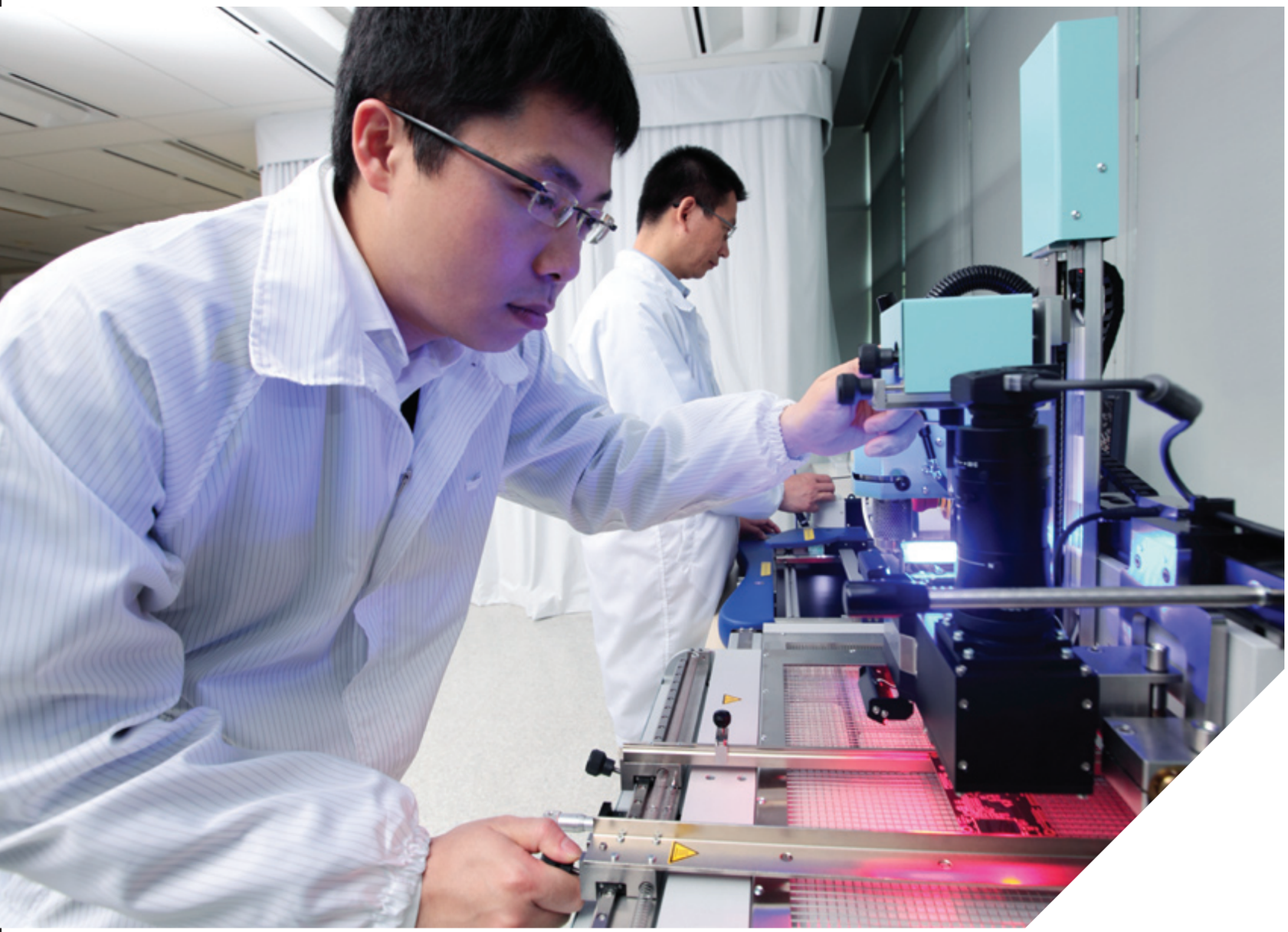
I Industry Collaborative Project 業界合作項目

Bio-Medical Electronics Team
生物醫學電子組

BME intends to be an effective bio-medical solution broker for Hong Kong, channelling new and off-field technologies tailoring for bio-medical requirements, as well as facilitating development of the industry by providing unique, compatible and total solutions of commercial value.

生物醫學電子組致力成為本港生物醫學界的中介者，把其他業界所研發的嶄新技術應用到生物醫療行業，同時提供獨特、具兼容性和全方位，並具商業價值的科研技術以促進生物醫學界的發展。

Dr. Francis Lee 李致淳博士
Acting R&D Director
Bio-Medical Electronics Team
生物醫學電子組 署理研發總監



In the past year, the Bio-Medical Electronics (BME) Team underwent a significant face lift. The Team completed several seed projects leading to the launching of three full projects funded by ITC. Two of these projects were related to Magnetic Resonance Imaging (MRI) while the third focused on brain training. It also started a seed project in high-speed digital pathology, which is favoured by the pathological microscopy industry and several local hospitals.

Despite a leadership change during the year, BME managed to reorganize and set up a more stable and self-sustaining organization structure focusing on clinical tests and statistics analysis, human factors plus medical user interfaces, and design for regulatory requirements.

生物醫學電子組（研發組）於過去一年經歷了重大的改變。繼成功完成了幾個種子項目後，研發組獲得創新及科技基金進一步資助，開始了共三個平台項目，包括兩個關於磁共振及一個關於腦部訓練的項目。研發組亦展開了一個關於高速病理切片數碼化系統的種子項目，獲得業界及香港幾間主要醫院的支持。

儘管於是年度經歷了管理層的變動，生物醫學電子組藉此機會重組，建立了一個更穩定和持久的架構，側重於臨床實驗及數據分析、人體工學及醫療用戶介面，和配合醫療規管制度作設計等幾方面。

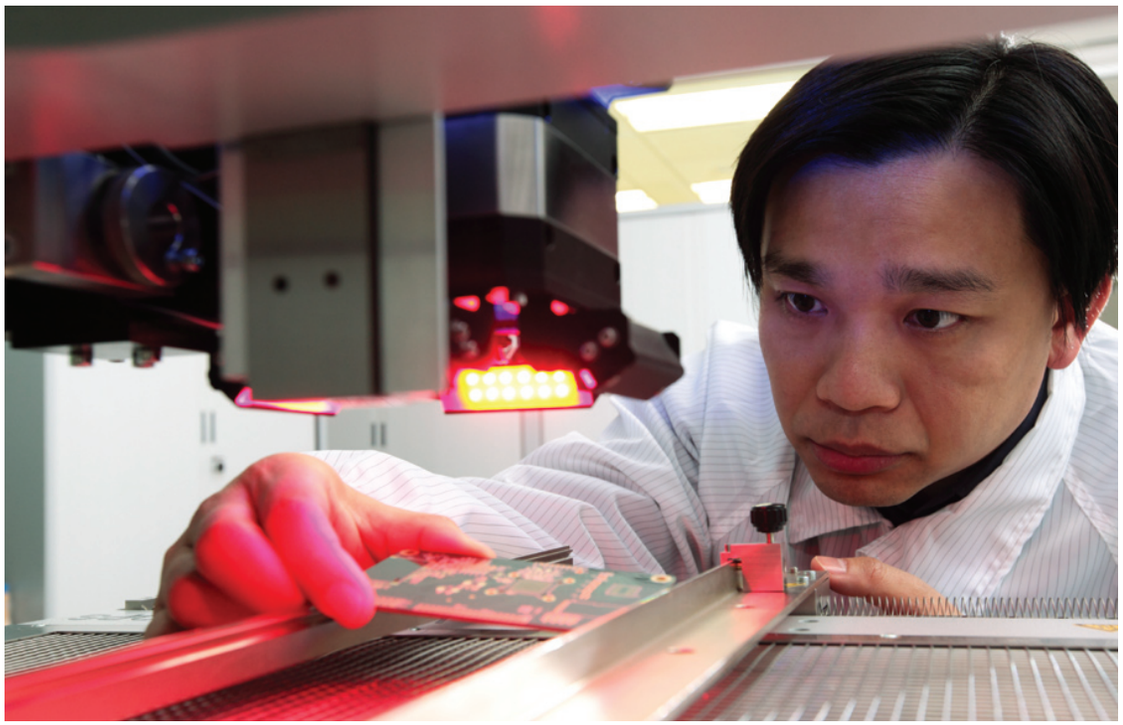
During the year, BME filed two patent applications in the U.S. for

- High Temperature Superconductor Tape Radio Frequency Phase Array and Receiver Coil and Cryostat for MRI Analysis of Infant Patients; and
- Binocular Vision Diagnostic and Training Goggle.

年內，生物醫學電子組在美國提交了兩項專利申請，包括

- 嬰兒專用高超導線磁共振接收線圈及低容器；及
- 雙眼立體視力檢查及訓練目鏡 。

Electronics assembly of prototype
原型電子裝配



Portable goggle for medical treatment
便攜式醫療電子目鏡

=1 number 數目

Patents Filed
專利申請數目 2

Medical Goggle System
醫療電子目鏡

Medical Goggle System for Amblyopia treatment in clinics
用於診所的弱視治療電子目鏡

Innovations
技術突破

Home use Amblyopia Treatment System for children
家用弱視治療兒童電子目鏡

A wearable MRE Driver is put on a patient
可穿戴的彈性成像診斷儀驅動器

The MRE Control System to check stiffness of human body tissues
檢查人體組織硬度的彈性成像診斷儀

MRI Incubator

BME completed 1.5T 8-channel phase array baby head coil prototype and 0.3T 4-channel phase array high temperature superconductor baby head coil prototype.

Magnetic Resonance Electrography (MRE)

BME completed MRE hardware prototype of controller system and Piezoelectric-based driver design for MRE application.

Brain Training Device for Amblyopia Treatment

Clinical trial implementation of an Amblyopia treatment software was conducted in three vision care hospitals on the Mainland. Optical design tailored for Amblyopia treatment using head-mount display platform was also developed.

Feasibility Study of High-speed Digital Pathology System

BME was engaged in designing and prototyping large field of view, high numerical aperture imaging lens. It also worked on real-time image stitching software development.

ASTRI Tele-care System

An ASTRI tele-care system was being developed. It includes an automatic data transmission system providing user-friendly tele-care platform for both patients and nurses, and a patients' personal tele-care system reminding them via mobile phone SMS to measure vital signs and take medication regularly.

磁共振成像培養箱

研發組成功完成嬰兒專用的1.5T八通道頭部線圈的原型及嬰兒專用的0.3T四通道高超導頭部線圈的原型。

彈性成像診斷儀 (觸診儀)

研發組成功完成彈性成像診斷儀控制器的原型及壓電陶瓷驅動器的設計。

弱視治療腦訓練儀

研發組於國內三間眼科醫院進行了弱視治療訓練程式的臨床試驗。研發組又以電子目鏡作為技術開發平台，製作了專為弱視治療訓練儀而設的光學設計。

高速病理切片數碼化系統

研發組設計並製作大視野、高數碼光圈成像鏡頭的原型，並研發實時影像縫合軟件。

應科院遠程照顧系統

研發組建立應科院遠程照顧系統，當中包括一個自動數據傳輸系統，以及方便病人及護士使用的系統平台。另外研發組又建立了一個病人自我健康管理系統，透過手機短訊提示，提醒病人按時量度生理數據及服用藥物。

Future Development and Project Highlights
未來發展及研發項目

As people become more health conscious, the use of advanced medical devices has also become increasingly common and popular. As a bio-medical electronics research team, BME aims at improving people's lifestyle and health by developing high efficiency medical devices and value-added applications at low cost for technology transfers to industry. In the coming year, BME will focus on four areas: MRI, Neuro-electronics (NET), Clinical Facilitation, and Home Care.

As MRI is recognized to be one of the best non-invasive medical imaging techniques with no ionizing radiation, with expertise in this area, BME intends to develop more advanced MRI-related imaging techniques with wider applications. BME will also explore neuro-electronics to relieve vision problems of different age groups.

Another BME objective is to develop various clinical devices to facilitate efficient surgical operations and medical diagnosis, as well as to reduce complications in specific medical procedures.

Lastly, BME will continue concentrating efforts on home care devices which allow patients, especially the elderly, to be monitored by remote control their health conditions.

隨著人們對健康越來越重視，先進醫療儀器的應用亦越見廣泛與普及。作為以醫療技術和儀器為研究目標的團隊，生物醫學電子組本著改善人類生活與健康的態度來進行研究，希望藉此給業界帶來高效率、高素質，但低成本的醫療技術。來年度，研發組的研究方向將集中於四方面：磁共振成像、神經通路電子、臨床醫療設備及家居保健。

磁共振無創而且不含輻射，是現今醫學中比較優越的成像系統。研發組憑著在這方面累積的經驗，計劃開發更先進、用途更廣泛的磁共振技術。另外研發組希望在神經通路電子這一領域上，為不同年齡患者改善視力。

研發組亦會致力研究應用於臨床的醫療儀器，希望藉此幫助醫護人員，更有效率地作出醫療診斷和進行相關手術，減少冗長而複雜的醫療步驟。

家居保健方面，本著「遠程照顧」這個概念，研發組會針對患者，尤其是長者的需要，研發一系列家居保健醫療用品，以遙控方式監察他們的健康狀況。

		Project 項目	Duration 時期
1	S	ASTRI Tele-care System 應科院遠程照顧系統	Jul 2010 – Jan 2011 二零一零年七月至二零一一年一月
2	S	Feasibility Study of High-speed Digital Pathology System 高速病理切片數碼化系統	Jan – Jul 2011 二零一一年一月至七月
3	P	Diagnostic MR Elastography Device (Palpategram) 彈性成像診斷儀（觸診儀）	Jul 2010 – Jan 2012 二零一零年七月至二零一二年一月
4	P	Multiple Function Brain Training Device for Amblyopia Treatment and Binocular Vision Training 弱視治療和雙眼立體視覺訓練之多功能腦訓練儀	Jul 2010 – Dec 2011 二零一零年七月至二零一一年十二月
5	P	Magnetic Resonance Imaging Incubator 磁共振成像培養箱	Jul 2010 – Jan 2012 二零一零年七月至二零一二年一月

P Platform Project
平台項目

S Seed Project
種子項目

Hong Kong Jockey Club Institute of Chinese Medicine
香港賽馬會中藥研究院

The Hong Kong Jockey Club Institute of Chinese Medicine (HKJCICM) was set up by the Hong Kong SAR Government in partnership with The Hong Kong Jockey Club as an ASTRI subsidiary. It is governed by a separate Board of Directors and receives a HK$500 million pledged donation from The Hong Kong Jockey Club Charities Trust for research and development of Chinese medicine (CM).

Led by the new Executive Director, HKJCICM adopts a revised development strategy focusing on:

- Supporting Government policies;
- Supporting the CM industry;
- Project funding and incubation;
- Information and exchange; and
- Promoting CM collaboration with the Mainland and other countries.

香港賽馬會中藥研究院（研究院）由香港特別行政區政府和香港賽馬會合作成立，為應科院的附屬機構。研究院的發展策略和業務由獨立董事局監督，並獲香港賽馬會慈善信託基金承諾捐款五億港元，支持中藥科研和發展計劃。

在新總裁的領導下，研究院重新規劃了發展策略，致力以下幾方面的工作：

- 支持政府中醫藥政策；
- 支持中藥業界發展；
- 資助科研項目；
- 建立資訊交流平台；及
- 促進與內地及其他地區在中藥方面的合作與交流。

Developments and Achievements
發展及成果

During the year, HKJCICM endeavoured to foster closer ties with strategic partners and actively participated in various activities including conferences, exhibitions and seminars. By coordinating local R&D efforts and enhancing collaboration among Government, businesses, academics and researchers, HKJCICM aimed at achieving synergy effect to promote and advance CM development in Hong Kong. With concerted efforts of its staff and contribution from collaborating partners, HKJCICM continued evolving to cope with the changing landscape of the CM sector and achieved the following:

- Obtained four patents: two were granted by the HKSAR Intellectual Property Department; one by the Mainland's State Intellectual Property Office for CM compositions and extraction and one by the U.S. Patent and Trademark Office for method of making antitussive medicine;

- R&D and production of chemical markers with 260 available for sale. Each chemical marker is supported by a certificate of analysis including purity (e.g. 95 per cent or 98 per cent). The markers are welcomed by the CM industry, academics and researchers for quality control, ingredient verification and natural product applied research;

- Provided funding support to: authentication studies of valuable Chinese Materia Medica; development of a screening platform for safe use of pyrrolizidine alkaloid-containing Chinese medicinal herbs; and drug development for irritable bowel syndrome;

- Launching of the English version of the Encyclopedia on Contemporary Medicinal Plants, a four-volume publication containing information on more than 800 medicinal plants. The reference value of the book is acknowledged by many local and international experts. Furthermore, in December 2010, the simplified Chinese version won the 2nd Chinese Government Award for Publishing as one of the 17 most outstanding publications in the science and technology category.

- Revamped the "Chinese Medicine Hong kong" information and exchange platform to provide extensive information on CM e-news, R&D and market development.

過去一年，研究院致力加強與各界的聯繫和合作，並積極參與各項活動，包括會議、展覽和座談會等。通過統籌和協調本地的科研力量，促進官、產、學、研合作，支援中藥研究，推動業界發展。在各方的支持和員工的努力下，研究院不斷自強，與時並進，以配合中藥的發展趨勢。研究院取得的主要成果包括：

- 獲得四項發明專利，包括兩項由香港特區政府知識產權署頒授的專利；一項由國家知識產權局就中藥成分和提取頒發的專利；還有一項由美國專利商標局就止咳藥頒授的專利。

- 研究及生產化學對照品，現時共有二百六十種可供銷售。每個產品均附有列明純度（如百分之九十五或百分之九十八）等資料的分析證書，廣受業界、學術界和科研人員的歡迎，用於控制產品質量、檢測中藥成份以及中藥天然產品的應用研究等工作。

- 資助中藥科研項目，包括名貴中藥材的鑒別研究；為含吡咯裏西啶生物鹼的中藥安全性建立篩選平台；及治療腸易激綜合症的中藥研究開發。

- 出版一套四冊的英文版《當代藥用植物典》，涵蓋八百多種常用的藥用植物，是一套極具價值的參考工具書，獲得海內外專家學者推介及好評。此書的中文簡體版更於二零一零年十二月榮獲第二屆中國出版政府獎，為科技類圖書中十七本最出色的刊物之一。

- 更新「中藥．香港」的資訊及交流平台，提供中藥新聞、科研和市場動態等資訊。

Financial Report
財務報告

Overview
概況

During FY2010/11, ASTRI continued to be prudent in its financial management. In brief, the income and expenditure for the year amounted to HK$431,770,087 and HK$446,761,078 respectively, resulting in a deficit of HK$14,990,991.

During the year, ASTRI received HK$106,106,000 from recurrent subvention (RS), of which HK$103,542,648 was recognized as income and the remaining balance was retained under accumulated reserve. During the same period, ASTRI also received HK$263,567,503 from ITF project funds, HK$380,725 from ITF General Support Programme and HK$5,140,869 from ITF internship fund. The industry contribution directly attributable to R&D projects increased from HK$25,674,121 in FY2009/10 to HK$29,339,305 in FY2010/11. Meanwhile, the other income received from the industries also increased from HK$16,383,548 in FY2009/10 to HK$23,318,158 in FY2010/11. The revenue recognition for industry contribution is based on the actual cash outflow of expenditures incurred during the year or upon the completion of contract services.

The total expenditure of RS amounted to HK$123,077,129. The full year RS expenditure comprised mainly:

- HK$69,306,627 in respect of salaries and related benefits;
- HK$21,724,563 in respect of office rental and related building management fees;
- HK$9,879,649 in respect of patent expenses and other professional fees;
- HK$4,679,623 in respect of commercialization and PR activities; and
- HK$17,486,667 in respect of ASTRI's other operating expenses.

The total expenditure of the R&D projects amounted to HK$292,906,808, which mainly represented the actual cash outflow incurred during the year for 75 full (platform and ICP) projects and 29 seed projects. Meanwhile, the internship expenditure amounted to HK$5,140,869, which represented the actual cash outflow of salary payments for interns engaged in 48 full projects.

The consolidated statements for the year ended 31 March 2011 of ASTRI and its subsidiaries, Hong Kong Jockey Club Institute of Chinese Medicine Limited and ASTRI Science and Technology Research (Shenzhen) Company Limited, have been audited by the external auditor with a clean audit opinion and extracts of the Consolidated Statement of Comprehensive Income and Consolidated Statement of Financial Position are set out on the following pages.

應科院在二零一零／一一年度，繼續以審慎的態度執行財務管理。本年度總計，收入和支出總額分別為港幣431,770,087元及港幣446,761,078元，虧損為港幣14,990,991元。

年度內，應科院收到經常性撥款港幣106,106,000元，其中港幣103,542,648元被列作收入，餘額則保留作累積儲備。同期，來自創新及科技基金的研發經費港幣263,567,503元，創新及科技基金的一般支援計劃資助港幣380,725元及創新及科技基金的實習研究員計劃資助港幣5,140,869元。業界直接投入研發項目的資金由二零零九／一零年港幣25,674,121元增加至二零一零／一一年港幣29,339,305元。同時，從業界所得的其他收入由二零零九／一零年港幣16,383,548元增加至二零一零／一一年港幣23,318,158元。被列作收入的業界投入資金只包括在年內或完成合約研究項目期間的實際開支。

經常性撥款的總支出達港幣123,077,129元，全年經常性撥款開支主要包括：

- 港幣69,306,627元薪酬及有關福利的支出；
- 港幣21,724,563元辦公室租金及有關辦公室管理費的支出；
- 港幣9,879,649元有關專利費及其他專業服務費的支出;
- 港幣4,679,623元有關商業化及推廣活動的支出；
- 港幣17,486,667元有關應科院其他營運方面的支出。

研發項目的總開支達港幣292,906,808元，主要代表七十五個正式項目（平台及業界合作項目）和二十九個種子項目的實際流出現金支出。同時，實習研究員計劃支出達港幣5,140,869元，相當於實習研究員參與四十八個正式項目的實際薪酬支出。

應科院及其附屬機構香港賽馬會中藥研究院有限公司及應科院科技研究〈深圳〉有限公司全年截至二零一一年三月三十一日止的綜合帳目經由外部核數師審計，並獲發無保留審計意見書。綜合全面收益表及綜合財務狀況表詳載於後頁。

Consolidated Statement of Comprehensive Income
綜合全面收益表

(For the year ended 31 March, 2011 截至二零一一年三月三十一日止年度)		2011 (HK$) 二零一一年(港幣)	2010 (HK$) 二零一零年(港幣)
Subvention	**資助**		
Income from Government subvention	政府資助收入	103,542,648	121,862,660
Administrative expenses	行政支出	(123,077,129)	(116,466,946)
(Deficit) surplus on subvention	資助（虧損）盈餘	(19,534,481)	5,395,714
Project Funding from Innovation and Technology Fund and Industry Contribution	**創新及科技基金及業界投入資金**		
Project fund income	項目收入		
» Innovation and Technology Fund	» 創新及科技基金	263,567,503	247,135,191
» Industry contribution	» 業界投入資金	29,339,305	25,674,121
Project expenditure	項目支出	(292,906,808)	(272,809,312)
Balance on project funding	項目資金餘額	-	-
Project Fund Income - General Support Programme	項目資金收入—一般支援計劃		
» Innovation and Technology Fund	» 創新及科技基金	380,725	-
» Industry contribution	» 業界投入資金	87,350	-
Project expenditure	項目支出	(468,075)	-
Balance on project funding	項目資金餘額	-	-
Internship Funding from Innovation and Technology Fund	**創新及科技基金的實習研究員計劃基金**		
Internship fund income	實習研究員計劃資助收入	5,140,869	4,129,155
Internship expenditure	實習研究員計劃支出	(5,140,869)	(4,129,155)
Balance on internship funding	實習研究員計劃資助餘額	-	-
Project Funding from the Hong Kong Jockey Club	**香港賽馬會項目基金**		
Project fund income	項目資助收入	6,393,529	8,992,073
Project expenditure	項目支出	(6,393,529)	(8,992,073)
Balance on project funding	項目資助餘額	-	-
Other Net Income	**其他淨收入**		
Other income	其他收入	23,318,158	16,383,548
Other expenses	其他支出	(9,156,472)	(10,525,036)
Other net income	其他淨收入	14,161,686	5,858,512
Amount Refund to the Government of the Hong Kong Special Administrative Region	**退還香港特別行政區政府款項**	(11,145,987)	(4,554,692)

		2011 (HK$) 二零一一年(港幣)	2010 (HK$) 二零一零年(港幣)
(Deficit) Surplus Before Taxation	**稅前（虧損）盈利**	(16,518,782)	6,699,534
Taxation Credit (Charge)	**稅收抵免(稅項支出)**	1,527,791	(1,090,169)
(Deficit) Surplus for the Year	**本年度（虧損）盈餘**	(14,990,991)	5,609,365
Other Comprehensive Income (Expense)	**其他全面收入(支出)**		
Exchange difference arising on translation	外幣報表換算差額	28,365	(355)
(Deficit) Surplus and Total Comprehensive (Expense) Income for the Year	**本年度（虧損）盈餘及全面總（支出）收入**	(14,962,626)	5,609,010
(Deficit) Surplus for the Year Attributable to	**本年度（虧損）盈餘分配於**		
Owners of the Company	公司擁有人	(14,974,423)	5,594,084
Non-controlling interests	非控股權益	16,568	15,281
		(14,990,991)	5,609,365
Total Comprehensive (Expense) Income for the Year Attributable to	**本年度全面總（支出）收入分配於**		
Owners of the Company	公司擁有人	(14,946,058)	5,593,729
Non-controlling interests	非控股權益	16,568	15,281
		(14,962,626)	5,609,010

Consolidated Statement of Financial Position
綜合財務狀況表

(At 31 March, 2011 於二零一一年三月三十一日)		2011 (HK$) 二零一一年(港幣)	2010 (HK$) 二零一零年(港幣)
Non-current asset	**非流動資產**		
Property, plant and equipment	物業，機器及設備	10,682,697	15,673,334
Current assets	**流動資產**		
Accounts and other receivables	賬戶及其他應收款項	14,196,324	10,374,421
Bank balances and cash	銀行結餘及現金	307,409,862	225,894,644
		321,606,186	236,269,065
Current liabilities	**流動負債**		
Accounts and other payables	賬戶及其他應付款項	37,344,180	33,681,524
Receipts in advance	預收款項	219,086,651	131,786,511
Amount due to the Government of the Hong Kong Special Administrative Region	香港特別行政區政府到期款項	11,173,496	4,655,721
Amount due to The Hong Kong Jockey Club	香港賽馬會到期款項	2,092,289	2,627,511
Taxation payable	應付稅項	131,090	-
		269,827,706	172,751,267
Net current assets	**流動資產淨值**	51,778,480	63,517,798
Total assets less current liabilities	**總資產減流動負債**	62,461,177	79,191,132
Non-current liabilities	**非流動負債**		
Deferred taxation	遞延稅項	(763,827)	(2,531,156)
Net assets	**資產淨值**	61,697,350	76,659,976
Capital and reserves	**股本及儲備**		
Share capital	股本	2	2
Accumulated surplus	累計盈餘	61,638,430	76,612,853
Translation reserve	折算儲備	27,990	(375)
Equity attributable to owners of the Company	**本公司擁有人應佔權益**	61,666,422	76,612,480
Non-controlling interests	**非控股權益**	30,928	47,496
		61,697,350	76,659,976

Our Way Forward
展望未來

New technologies are bringing revolutionary changes to people's lifestyle. ASTRI is determined to play a vital role in helping Hong Kong make history in this important technology-driven era. We will push to the limit our innovativeness, create economic impacts with our new technologies and make a name for ASTRI and Hong Kong. We will extend our network to other parts of the world, nurture future technology leaders and commercialize our applied technologies in the international markets to enrich the lives of millions. With the talents and commitment of our ASTRI members, we will make our innovative sparks fly for generations to come.

先進科技為人類生活帶來革命性的改變。應科院矢志肩負重任，在這個以科技驅動的新時代，為香港締造歷史。我們會盡情發揮創新能力，開拓應用科技新領域，創造經濟效益，為應科院和香港揚名。我們會不斷擴大聯繫網至世界各地，培育未來的科技領袖，將我們的應用科技在國際市場上商品化，造福廣大民眾。憑藉員工的才華和努力，我們繼續讓創意飛翔，薪火相傳，成為業界之光。

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