Building on

Applied R&D Excellence

創建，全賴優質應用科研

2008/09

Annual Report 年報

Hong Kong Applied Science and Technology Research Institute Company Limited

香港應用科技研究院有限公司

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公司概況

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

In April 2006, ASTRI was designated the Hong Kong Research and Development Centre for Information and Communications Technologies by the Innovation and Technology Commission with special goals to perform leading-edge R&D for technology transfer to industry, develop much needed technological human resources and act as a focal point bringing together industry and university R&D assets.

Since its inception, ASTRI has been delivering world-class technologies and customer-focused R&D catering to the needs of industry. Its R&D efforts traverse four interrelated areas, namely Communications Technologies, Enterprise & Consumer Electronics, IC Design and Material & Packaging Technologies. In March 2009, the Board of Directors also approved the establishment of a research team in Bio-medical Electronics to meet the changing needs of the international communities.

During the past years, the Institute has built teams of excellent researchers, produced a volume of intellectual properties (IP) and created real economic impact by transferring technologies to its clients in Hong Kong, the Mainland and the region. To extend its service to the Mainland market, ASTRI established a wholly owned subsidiary, the ASTRI Science and Technology Research (Shenzhen) Co. Ltd, in Shenzhen in 2008.

香港應用科技研究院（應科院）由香港特別行政區政府於二千年成立，其使命是要透過應用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。

二零零六年四月，應科院獲創新科技署委託，承辦「香港資訊及通訊技術研發中心」，肩負進行高質素研發工作，把科技成果轉移給業界；培育優秀科技人才；及整合業界和學術界的研發資源等任務。

應科院銳意創造世界級頂尖科技，實踐以顧客為導向的應用研究，以配合業界的真正需要。其研究範疇橫跨四個相關領域，包括通訊技術、企業與消費電子、集成電路設計及材料與構裝技術。董事局於二零零九年三月通過成立生物醫學電子組，以配合環球市場需要。

多年來，應科院培養了不少卓越的研究人員，註冊了多項知識產權，並透過將這些嶄新科技轉移給香港、中國內地及區內業界，創造經濟效益。為進一步服務內地市場，應科院於二零零八年在深圳設立了全資附屬公司「應科院科技研究（深圳）有限公司」。

Looking ahead, ASTRI will strive to become one of the best and most influential R&D centres in the region enabling Hong Kong and the Mainland to enhance value from competitive and continuous technological advances for years to come.

展望將來，應科院將致力發展成為區內最優秀和最具影響力的研發中心之一，為促進香港及全中國持續的科技發展和提升競爭力而作出貢獻。

Mission and Goals

ASTRI's mission is to perform applied research and development (R&D) to enhance Hong Kong's competitiveness in technology-based industries.

Its goals are:

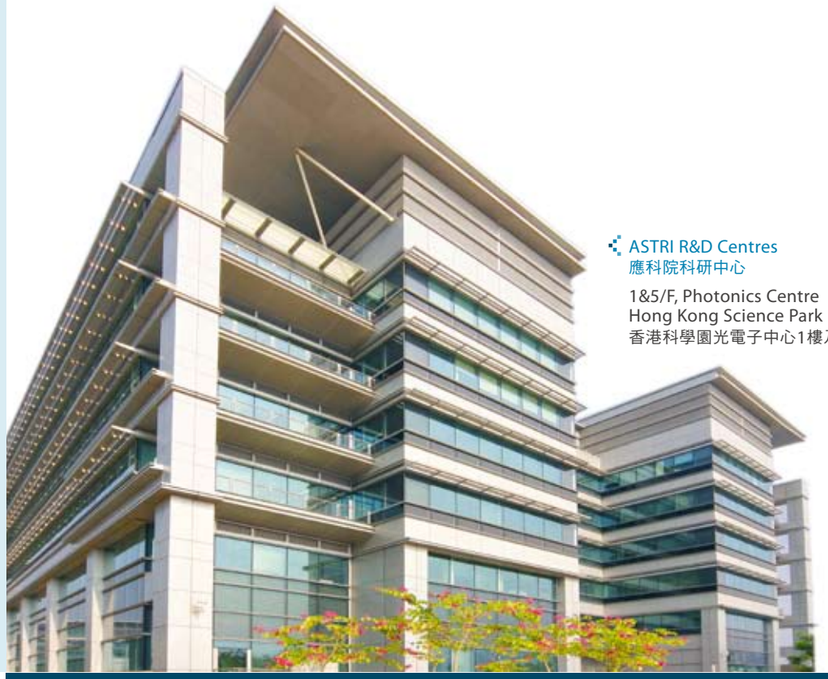
- performing relevant and high quality R&D for transfer to industry;
- enhancing Hong Kong's technological human resources development;
- acting as a magnet to attract international R&D talent to work in Hong Kong;
- acting as spawning ground for technology entrepreneurs;
- promoting greater application of technology in industry; and
- providing a focal point for industry-university collaboration.

使命與目標

應科院肩負的公眾使命，是實踐應用科技的研究和發展，藉此協助本港發展以科技為本的工業，從而提升本港的競爭力。

應科院要達到的目標包括：

- 進行相關及高質素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 R&D Centres
應科院科研中心

1&5/F, Photonics Centre
Hong Kong Science Park
香港科學園光電子中心1樓及5樓

Chairman's Foreword
主席序言

Having chaired the Board of this dynamic and conscientious institution for nearly two years, I am delighted to have witnessed once again ASTRI's many impressive achievements and progress during the year under review.

Let me begin my foreword for the 2008/09 Annual Report by welcoming five new Board members: Mr. Anthony Au, Prof. Philip Chan, Prof. Chew Wen-cho, Mr. Victor Ng and Mr. Luther Wong. I also warmly welcome our new Chief Executive Officer, Dr. Cheung Nim-kwan, who officially took up this most challenging position in December last year. I have no doubt the Board and the CEO will work closely together in guiding ASTRI to the next phase of successful development.

At the same time, I must gratefully, but sadly, bid farewell to four long serving Directors of the Board and the Interim CEO on their retirements. To the retired Directors — Dr. Roy Chung, Mr. Tom Tang, Mr. Henry Tsang, and Prof. Wong Wing-shing — and the Interim CEO, Prof. Edward Yang, I wish to record the Board's profound gratitude for their invaluable contributions over the years. I have no doubt that we at ASTRI could still count on their advice and support in the months ahead. I am also happy to report that Prof. Yang is remaining with ASTRI as Senior Advisor to the CEO.

During the 12 months from 1 April, 2008 to 31 March, 2009, every one of us has experienced and to a varying degree, suffered from the devastating and unprecedented global economic turbulence, in which our city has also been negatively impacted. As the financial tsunami swept mercilessly across all continents, I sensed again the unique "never say die" spirit of Hong Kong and its people's strong resilience and resourcefulness from all walks of life in gearing up and preparing to meet all challenges. One of the strategies shared by both the Government and the community at large is to attach stronger and more extensive support and investments to the technologically-savvy, knowledge-based sector of the economy, to which ASTRI, needless to say, will have a key role to play and much to contribute. As detailed in this report, ASTRI has again exceeded all its major business targets. We have become not only a dedicated partner to the local industries, but also a source of technological inventions as well as technology transfers that could be applied to further strengthen and enhance Hong Kong's competitiveness in most parts of the world.

本人出任應科院董事局主席已近兩年，對於這所充滿活力、處事嚴謹的機構在過去一年再次取得驕人成績和進展，深感欣慰。

首先，本人要歡迎區煒洪先生、陳正豪教授、周永祖教授、吳國豪先生及王樂得先生五位新董事；我也向去年十二月履任的行政總裁張念坤博士致以熱烈歡迎，由他來肩負這個充滿挑戰的職務，可謂深慶得人。深信董事局與新任行政總裁必會緊密合作，帶領應科院更上一層樓。

與此同時，我也懷着複雜的心情來向四位服務良久的董事局成員和卸任的行政總裁道別。謹代表董事局向鍾志平博士、唐慶年先生、曾玉煌先生及黃永成教授等卸任董事，以及暫代行政總裁楊雄哲教授，對他們多年來的卓越貢獻表示衷心感謝。深信在未來歲月，他們仍會繼續支持和指導應科院。事實上，楊教授應允留任應科院資深顧問，實在令人欣喜。

由二零零八年四月一日至二零零九年三月三十一日的十二個月間，破壞性極大、前所未見的環球金融風暴颳起，香港亦難免受到影響，每位香港人或多或少受到衝擊。令人安慰的是，當金融海嘯無情地席捲全球，香港再次發揮出獨一無二的「打不死」精神，各階層市民亦展示出強勁的適應能力和應變能力，為應付挑戰作好準備。政府與市民大眾應付挑戰的其中一項共識是把更有力和廣泛的支援與投資，投放在技術性強、知識為本的經濟領域上，不必多說，對此應科院必能擔當起重要角色，並且作出貢獻。一如本年報中詳述，應科院去年再度就多項主要運作目標創出新猷，不但成為本地業界忠誠的合作夥伴，更藉科技創新及技術轉移加強了香港在國際市場的競爭力。

應科院經過近十載的發展，除了累積了大量技術成果外，更培育了大批富創意的科研人才，他們不但是應科院賴以屢創高峰的寶貴資產，也是香港經濟由人力密集漸漸轉型至知識為本的過程中，得以不斷突破的其中一股重要力量。

我確信香港若要促進其創新科技的競爭力，培育人才是首要工作；應科院一向非常重視人力資源，希望能從世界各地吸引最優秀的

After nearly a decade of development, I am proud to point out that ASTRI, besides amassing a volume of technological outputs, has also nurtured numerous creative R&D talents. These talents are not only assets which could help ASTRI scale new heights, but also a source of strength that could help Hong Kong excel in its long journey of transformation from a labour intensive to a knowledge-based economy.

I therefore firmly believe that nurturing talents is the top priority of our Government if Hong Kong is to further enhance its competitiveness in innovation and technology. ASTRI always values highly its own people. We indeed wish to attract the best minds from different parts of the world. This year, through the highly successful Industry Collaborative Project scheme, we have attracted a group of young entrepreneurs from Silicon Valley in the United States to undertake a joint project with ASTRI. This most welcome joint venture not only induces economic benefits to our community as it will no doubt offer job opportunities to Hong Kong's university graduates, but also leads us to new R&D directions, generates technical breakthroughs and above all, strengthens and promotes the immensely important spirit of entrepreneurship for the young people of Hong Kong.

As far as its R&D direction is concerned, ASTRI seeks to strike a 70:30 balance between sustaining technology and disruptive technology. In addition to developing high-end innovative technologies, ASTRI also hopes to cultivate high quality but "inexpensive" technologies of an applied nature that have significant and far reaching impact on specific markets, including those on the Mainland. With the support of the Hong Kong SAR Government and guided by China's 11th Five-Year Development Plan, we are determined to respond primarily to the need of our motherland by undertaking an increased number of disruptive technology projects in the coming months with the hope that these projects, when completed, would effectively improve the quality of life for people all over the world.

In conclusion, I would like to take this opportunity to convey my heartfelt gratitude to all the staff members of ASTRI for their concerted efforts and selfless dedication during the past year. As we forge ahead amid tough challenges, I have every confidence to believe that ASTRI will overcome all obstacles and emerge as a stronger and more successful institution of applied research when we celebrate our 10th Anniversary in 2010.

Dr. Patrick Wang Shui-chung, JP
Chairman of the Board

Dr. Wang greeting Minister Wan Gang from the Chinese Ministry of Science and Technology during his visit to ASTRI.
中國科技部萬鋼部長來訪應科院，獲汪博士熱情接待。

人才來港發展。本年度我們透過「業界合作項目」（ICP）計劃，從美國矽谷邀請得數位青年企業家與應科院攜手合作進行一項合營項目，該項目不但為本港大學畢業生提供就業機會，誘發社會經濟效益，也引領我們釐訂研發新方向，尋求技術突破；最重要的是，它有助在本港青年人之間推動至為可貴的企業家精神。

在研發方向方面，應科院致力將持守性技術項目和突破性技術項目定為七三之比。除了發展尖端創新技術外，我們還希望發展優質而低成本的應用技術，在中國內地和世界各國的特定市場中，作出意義深遠的貢獻。在香港特區政府的支持和國家第十一個五年發展計劃的引導下，我們決心主力應對祖國所需，繼續增加突破性技術項目的研發，並期待利用研究成果進一步提升全球人類的生活質素。

最後本人藉此機會向全體員工致以衷心謝意，感謝他們過去一年團結努力，無私付出。在應科院上下齊心迎接挑戰，奮勇向前的情況下，我信心十足，深信應科院必能跨越一切障礙，在二零一零年慶祝成立十周年時發展成一所更強大、更成功的應用科研機構。

董事局主席
汪穗中博士

CEO's Review
行政總裁回顧

"Despite the less than favourable economic climate caused by the global financial turmoil, the customer-focused R&D undertaken by ASTRI was still overwhelmingly supported by industry."

「儘管環球金融震盪造成了不利的經濟環境，但應科院以顧客為導向的科技項目仍然得到業界的廣泛支持。」

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

It is indeed a great honour to have been entrusted by the Hong Kong SAR Government and the ASTRI Board of Directors with the important task of leading ASTRI as its Chief Executive Officer.

As many of you are aware, I have been away from Hong Kong for more than three decades, but my heart and soul have never left this exciting city where I was born, raised and educated. I am, therefore, most privileged to be able to contribute my knowledge and experience to ASTRI and the local community during this important transitional period when Hong Kong is moving steadily and smoothly towards becoming a knowledge and technology-based society.

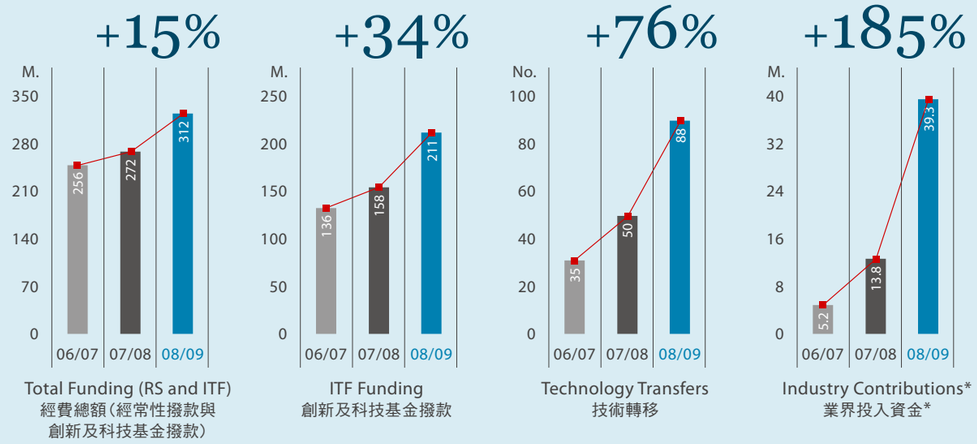
Since assuming my present position in December last year, I have been most impressed by the professionalism and commitment of my colleagues and the outstanding achievements of this institution. I believe ASTRI's success, to a very large extent, is attributed to the combined efforts and dedication of all its staff. I wish to express my sincere gratitude to my predecessor, Prof. Edward Yang, and his team for making ASTRI what it is today. I also wish to pledge my full commitment in taking ASTRI to a higher level of excellence during my term of office.

本人能夠獲得香港特區政府及應科院董事局的信任，出任應科院行政總裁這個重要職務，深感榮幸。

雖然本人在海外生活和工作已經超過三十年，但對於香港，這個我生於斯、長於斯和受教育於斯的繁華大都會，一直念念不忘，希望有朝一日能夠回饋社會。今天能有機會為應科院和社會貢獻自己的知識和經驗，在推動香港發展成為知識和科技型社會的重要過程中，略盡綿力，是本人的光榮，也是一項重要的使命。

自去年十二月上任以來，本人對於應科院員工的專業態度和工作熱誠，以及所取得的驕人成績，非常欣賞，相信成功背後有賴整個團隊的共同努力和全情投入。本人謹此向前任行政總裁楊雄哲教授及他的團隊，表示衷心感謝。本人承諾會竭盡所能，在任期內帶領應科院締造更輝煌的成就。

Year to Year Performance
年度業績



M. - Million (HK$) 百萬(港元)　No. - Number 數目　* including in-kind contribution 包括物資資助

I am pleased to report that 2008/09 was again another year of success and progress for ASTRI with all major targets met and even exceeded. The Innovation and Technology Fund (ITF) we received to support our R&D endeavours rose 34 per cent ($158 million to $211 million). The total funding including recurrent subvention (RS) went up by 15 per cent ($272 million to $312 million). This financial support has provided ASTRI with the much needed resources for embarking on further innovative R&D projects. During the year, 14 patents were granted by the U.S. and the Mainland and 114 patent applications were filed.

Despite the less than favourable economic climate caused by the global financial turmoil, the customer-focused R&D undertaken by ASTRI was still overwhelmingly supported by industry. The number of technology transfers went up from 50 to 88 during the past 12 months, representing a substantial increase of 76 per cent compared to the previous year. Industry contributions received by ASTRI increased by 185 per cent from $13.8 million to a record $39.3 million this year.

In support of Government strategies in developing Hong Kong into a technological centre, ASTRI continues to deliver world-class innovation while at the same time fosters industry collaboration with the view of enhancing their competitive edge to capture new business opportunities.

本人欣然向大家滙報，二零零八／零九財政年度是應科院成果豐碩的一年，我們再次達到或超越所有主要指標。來自創新及科技基金的研發經費增加百分之三十四（由一億五千八百萬元增加至二億一千一百萬元）；經費總額包括經常性撥款，增加了百分之十五（由二億七千二百萬元增加至三億一千二百萬元）。年度內，應科院在美國及中國獲得的發明專利共十四項，已提交專利申請的項目達一百一十四項。

儘管環球金融震盪造成了不利的經濟環境，但應科院以顧客為導向的科技項目仍然得到業界的廣泛支持。過去一年，應科院完成的技術轉移項目由五十項增加至八十八項，即大幅增加了百分之七十六；從業界所得的資金也創新高，由一千三百八十萬元增加至三千九百三十萬元，增幅高達百分之一百八十五。

為配合政府要將香港發展成為一個科技中心的策略，應科院一直致力開創世界一流科技，同時與業界緊密合作，藉此提升產業的競爭能力，協助他們把握新商機。

While ASTRI continues to focus on its core R&D technologies, the Institution has decided to break new ground by expanding its R&D initiative into the area of bio-medical electronics (BME) with the establishment of a BME research team. Starting with a couple of seed projects in medical imaging technology, the team in time will no doubt develop in both depth and breadth.

Meanwhile, the Industry Collaborative Project (ICP) scheme, which was launched last year to leverage the strengths and resources of ASTRI and its partners to develop new technologies catered to market needs, has been highly successful with the initiation of six ICP projects during the year.

It is particularly worth mentioning that in March this year, an ICP agreement was signed with Credo, a start-up company formed by three young Chinese entrepreneurs from Silicon Valley in the United States, to co-develop high speed data communication IC products. It is the first time for ASTRI to partner with a technology company from Silicon Valley. I am certain this collaborative project, in addition to bringing in state-of-the-art technology in IC design, will also uplift Hong Kong's technological capability in the semiconductor industry to world-class level by offering R&D opportunities to our young talent.

ASTRI is also confident this collaboration will demonstrate to potential investors that hi-tech business not only has a bright future, but can also create jobs and wealth. We are hopeful the venture with Credo will attract more overseas hi-tech companies to become our partners in the months ahead.

Fully aware that technical human resources is crucial for sustaining Hong Kong's competitiveness, ASTRI has never lost sight in nurturing talent. To meet the needs of our expanding R&D endeavours and respond to Government's call to create jobs for local university graduates in face of the economic downturn, ASTRI successfully launched a large scale campaign in March this year to recruit engineering and science graduates to fill Government sponsored intern positions as well as other R&D posts.

應科院一方面主力發展核心技術，另一方面繼續開拓新研發領域，例如在生物醫學電子方面便成立了一個新的研發組，專責這方面的工作。該組會先著手研究磁共振成像技術，日後將會往更深和更廣的研發層面邁進。

應科院去年推出的「業界合作項目」（ICP）計劃，結合本院和合作夥伴的優勢和資源，發展可配合市場需求的產品。計劃推行一年以來，已展開六個合作項目，業界反應令人鼓舞。

當中特別值得一提的是今年三月，應科院與科睿通簽署協議，合力研發高速數據傳訊集成電路產品。科睿通是一家總部設於美國矽谷的公司，由三位年青華裔企業家創辦。這是應科院首次與矽谷的科技公司合作。本人深信是次合作，不但將最先進的集成電路設計技術引進香港，提升香港在半導體方面的技術至世界級水平，本地年輕研發人才也可以有機會從參與中吸取寶貴經驗。

我們希望透過今次的成功例子，向有意與我們合作的投資者證明科技行業前途無限，既可創造財富，也可提供就業機會。我們期待在不久將來，有更多海外高科技公司成為我們的合作夥伴。

科技人才是維持香港競爭力的重要關鍵，故此應科院非常注重培養人才。為配合應科院科研項目的擴展，以及響應政府的呼籲，要在當前經濟不景的情況下，為本地大學畢業生提供就業機會，本院於今年三月成功舉辦了一項大型活動，招募理科畢業生參加由政府資助的實習研究員計劃及申請本院其他研究職位，反應非常理想。

To achieve greater access to the huge and booming Mainland market, a wholly-owned subsidiary of ASTRI, the ASTRI Science and Technology Research (Shenzhen) Company Ltd, was established in Shenzhen Hi-tech Industrial Park in December last year. With this new operation in place, ASTRI has established a strong foothold on the Mainland that can further facilitate and strengthen collaboration and business opportunities with academia and industry in Shenzhen and the Pearl River Delta.

As we are well aware ASTRI is supported by public funds, we have diligently reviewed our operations to achieve an even higher level of transparency, accountability and cost-effectiveness. In this regard, I am pleased to report that ASTRI was able to again contain its administrative staffing cost to a relatively low level.

The ratio of management and administrative manpower cost ($29.21 million) over the total manpower cost ($201.46 million) in 2008/09 was about 14.5 per cent. Of the total 475 staff employed by ASTRI as at 31 March, 2009, less than 15 per cent are non-R&D staff (70). This latest expenditure on administrative staffing compares favourably with other higher-education and research institutions in the region. The management is also monitoring closely all items of its expenditures and will continue to employ appropriate measures to further achieve a higher level of cost-effectiveness and value for money in the coming year.

In the wake of the global financial tsunami, the year 2008 has been a year full of challenges for all sectors of the Hong Kong community. However, we are optimistic that with support from both the Government and industry as well as the total commitment of all members at ASTRI, we will continue to excel in our customer-focused R&D endeavours and contribute significantly not only to the sustainable growth of customers, but also to the future well being of Hong Kong, the motherland and the region as a whole.

Dr. Cheung Nim-kwan
Chief Executive Officer

為了進一步在中國內地這個龐大而蓬勃的市場發展應科院的業務，去年十二月，應科院於深圳高新區成立了一所全資附屬公司—應科院科技研究（深圳）有限公司。有了這個據點，應科院將可以與深圳及珠江三角洲的學術界及業界加強合作，開創更多商機。

我們充份了解到應科院是由公帑支持，故此一直努力監察應科院的運作以進一步提高透明度、加強問責性及達至更佳成本效益。本人很高興向大家報告，應科院於年度內已再次成功把行政人員的薪酬控制在合理水平。

去年，管理及行政人力成本（二千九百二十一萬元）約佔總人力成本總額（二億零一百四十六萬元）百份之十四點五。截至二零零九年三月三十一日，應科院共有四百七十五名僱員，當中少於百分之十五（七十人）為非研發人員。本院行政員工薪酬開支的最新情況與區內其他教育及研究機構大致相若。管理層會繼續密切監控所有項目開支，並採取適當措施，務求令所有支出用得其所，在來年進一步增加成本效益。

隨著金融海嘯席捲全球，二零零八年對於香港各行各業而言，都是充滿挑戰的一年。然而我們對前景仍然感到樂觀，憑著政府、業界的支持，以及應科院全體成員的共同努力，我們將全力以赴，精益求精，繼續發展以顧客為導向的研發工作，不僅為客戶業務的持續增長而努力，同時也為香港、祖國，以至整個地區的福祉作出貢獻。

行政總裁
張念坤博士

Operation and Performance
營運與業績

Operation

As a publicly-funded applied research institution, ASTRI operates under the firm conviction that it exists for maximizing "public good", and this public good is measured by economic impact and other benefits it brings to the industry and the community at large.

To generate and sustain economic impact, ASTRI is vigorously focusing on the following:

(a) "Customers" -- the companies making use of the technologies and intellectual properties (IP) developed by ASTRI to achieve economic returns. In this regard, ASTRI's research projects are all market-driven catering for the needs of customers and the industry; and

(b) "Technology Transfer" -- the paid transfer of well-defined product technologies, service technologies or enabling technologies through a licensed contract, a service contract or other legal means from ASTRI to industry customers for commercialization. For ASTRI to link its researches to potential customers for successful commercialization, technology transfers are of paramount importance.

Based on the above considerations, ASTRI builds its operations under the theme "customer-focused R&D". It is a methodology aimed at maximizing R&D "customer impact" to make successful conversion of researches a systematic process. This process builds customer focus into every aspect of ASTRI's R&D programmes, from initiation to transfer of generated IPs to customers:

(a) Recruit R&D leaders who are not only outstanding technologists and seasoned professionals with extensive management track records, but also specialists possessing extensive "domain knowledge" of industries;

(b) Plan and substantiate compelling technology initiatives to engage potential customers before R&D projects are initiated. These visions are then broken down to become projects for implementation;

(c) Identify customers clearly before the project is approved for launching;

(d) Work with customers as early and closely as possible, treating them as partners rather than receivers of developed technologies;

(e) Build R&D teams that are not only capable of innovating IPs, but also possess the knowledge and skills to make them competitive, market-compatible and serviceable, so that they can be readily transferred to potential customers for manufacturability; and

(f) Identify, build and upgrade core technologies continuously to anticipate and satisfy the varying needs of its wide customer base.

營運

作為一家政府資助的應用研究機構，應科院秉持產生最大「公眾利益」這信念來經營，而此公眾利益是以應科院為業界及整體社會所產生的經濟效益和其他得益來衡量。

為創造及維持經濟效益，應科院啟力以下列為營運重點：

(a) 「顧客」—亦即利用應科院開發的技術和知識產權，以獲取經濟回報的公司。由此，應科院進行的研究項目必須遵循市場導向，以迎合顧客和產業的需要為原則；及

(b) 「技術轉移」—亦即以授權協議、服務合同或其他合約形式，將明確界定的產品技術、服務技術或應用技術，由應科院以收費方式轉移至業界顧客以作商品化。應科院要把研發項目與潛在顧客連結，繼而成功商業化，技術轉移至為重要。

應科院基於以上考慮，以「顧客導向研發」為主軸建立經營模式。這是一套目的為確保研發活動產生最大「顧客效益」的方法，使研究轉化為具體成果的過程系統化。這套系統化過程按以下步驟把「顧客導向」納入應科院研發項目每一環節—由研究計劃開始直至將知識產權轉移至顧客：

(a) 招聘的研發人才不單要是傑出的科技專才和富管理經驗的專家，更須對其專注的行業擁有豐富的「領域知識」；

(b) 於展開研發項目前，先構思和落實令人信服的技術意念，以吸引潛在客戶，再把這些創見分為各個項目，予以執行；

(c) 清楚確定顧客對象之後，研究項目才准予展開；

(d) 及早與顧客緊密合作，將顧客視為研發夥伴而非只是技術的接收者；

(e) 研發隊伍不但要有能力創造新的知識產權，亦須具備知識和技術，使該些創新發明保持競爭力，符合市場條件並可供使用，以便隨時轉移予潛在顧客，投入生產；及

(f) 不斷地識別、建立及提升核心技術，以預計和滿足廣大顧客群的各種不同需求。

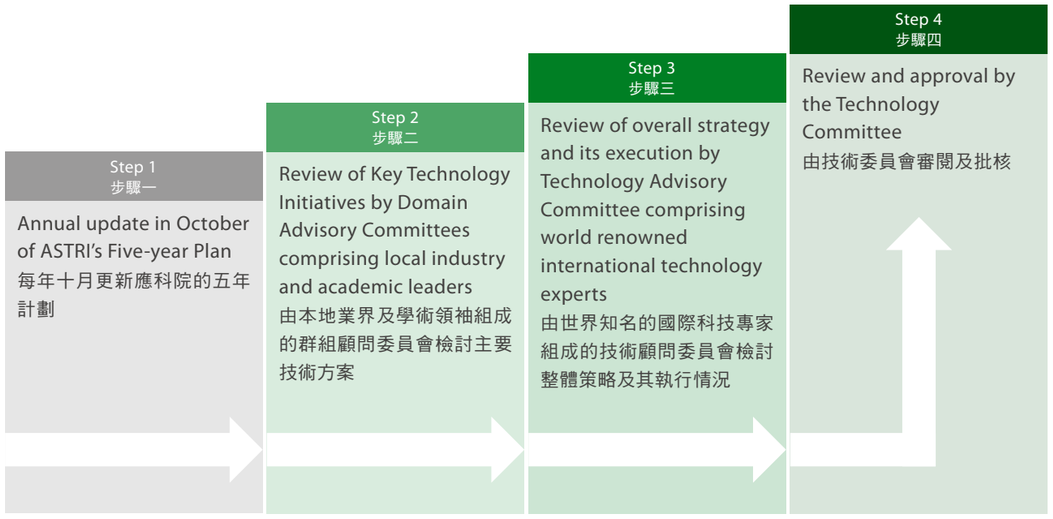
Management for Quality

In addition to developing world-class intellectual properties and transferring them to customers, ASTRI puts much emphasis on ensuring the quality of its researches and management processes.

R&D Quality Assurance

To ensure the quality of its R&D programmes, ASTRI implements a four-step process for its annual planning and vetting of individual projects, and continuously monitors all ongoing projects.

Every year, ASTRI conducts its Annual Planning Cycle comprising the following steps:



All R&D projects are continuously monitored by the Technology Committee to evaluate effectiveness of customer engagement. Half-yearly progress reports are submitted to the Innovation and Technology Commission to examine the project's progress against its stated milestones. Projects are also subject to quarterly reviews by the Technology Committee of the Board and each ongoing project is monitored monthly by the Chief Technology Officer.

Corporate Governance

To achieve good governance, a Corporate Governance Manual clearly stating ASTRI's policies and principles in governance was compiled to facilitate the Board of Directors and Management to operate and oversee ASTRI's business in a transparent and accountable manner.

優質管理

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，應科院還非常重視確保研發和管理過程的質素。

研發質素保證

為確保其研發項目的質素，應科院在年度規劃及個別項目審批的工作上，均經過四步程序，並持續監察所有正在進行之項目。

應科院每年均以年度週期作出規劃，當中包括以下步驟：

所有研發項目均由董事局轄下技術委員會持續監控，以審評其獲取顧客支持的成效。另外，應科院向創新科技署每半年提交進度報告，以便查核項目的進展以及達標程度。技術委員會亦會於每季審核各項目，而應科院首席科技總監會監察各項目每月的進度。

企業管治

為有效進行良好的企業管治，應科院的《企業管治手冊》清楚列明應科院的管治政策和原則，以協助董事局及管理層以具透明度的方式和負責任的態度管理和監督應科院。

The contents of this Manual are based mainly on the existing Memorandum and Articles of Association of Hong Kong Applied Science and Technology Research Institute Company Limited, the Memorandum of Administrative Arrangements on the Administration of Government Subvention, the Memorandum of Administrative Arrangements on the Administration of the Funding from the Innovation and Technology Fund signed between the HKSAR Government and ASTRI in 2002, the prevailing policies and procedures approved by the Board of Directors, and the existing ASTRI's practice and guidelines.

ASTRI is one of the very few R&D institutions in the world with management processes certified with ISO 9001:2000 standards. The four essential objectives for ASTRI's ISO-based management system are Transparency, Speed, User-friendliness and Governance.

To efficiently exercise good corporate governance, an internal audit team reporting to the Audit Committee of the Board of Directors (Board) was established in 2007 to assist the Board by providing it with information and assurance on internal management controls and observations on major control inadequacies.

The Internal Audit Department carries out annual audits to meet coverage requirements specified by the Audit Committee in accordance with the determined priorities. The Internal Audit Department also reviews the internal control system and reports the efficiency and effectiveness of such system to the Board via the Audit Committee. Semi-annual Internal Audit Progress Reports are presented to the Audit Committee.

The Board appointed the Head of Internal Audit as the Compliance Officer in April 2007 to assist its governance function 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 continued compliance with the Guide to Information and Technology Support Programme (ITSP), corporate governance policy, ISO procedures and other relevant guidelines, the Compliance Officer is required to submit quarterly reports to the Audit Committee.

At the time of reporting, the Management was in the process of updating and revising the Corporate Governance Manual to take into account necessary changes and developments required for improving ASTRI's operation modes.

手冊內容主要建基於香港應用科技研究院有限公司的組織章程大綱及章程細則、政府及應科院就資助金管理事宜而簽訂的行政安排備忘錄、政府及應科院於二零零二年就創新及科技基金撥款的管理事宜而簽訂的行政安排備忘錄、獲董事局通過的主要政策和程序，及應科院現行的常規和守則。

應科院是世界上少數獲ISO 9001:2000管理程序標準認證的科研機構。應科院以國際標準化組織（ISO）為基礎的管理系統的四大目標為透明度、效率、簡易程度和管治。

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組，該組向審計委員會報告，協助董事局，向其提供有關內部管理控制的資訊和保證，以及對於主要控制不足的觀察結果。

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。內部審計部門並會審核內部控制制度，並透過審計委員會向董事局報告該制度的效率和有效性。內部審計部門每半年便向審計委員會提交內部審計進度報告。

此外董事局於二零零七年四月委任內部審計主管擔任合規主任，協助其進行企業管治，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。

撰寫此報告期間，管理層考慮到要改進應科院運作模式，必需作出改變和發展，正更新和修改《企業管治手冊》。

Performance

Targets

A very critical part of customer-focused R&D practices is the rigorous setting and monitoring of quantitative performance targets. These targets are used as the essential basis for appraising performances of R&D groups and their ASTRI leaders. They are set at the beginning of the financial year and monitored continuously for attainment. ASTRI adopts three main types of quantitative performance targets, which are:

(a) The 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;
(b) The number of patents filed per year as well as number of patents granted and their success ratio. This is important because patents indicate the worthiness of innovations and are used to increase the value of technology transfer activities. Patents also enhance ASTRI's capability in attracting commercial partners or customers as they are assurances that ASTRI's technologies are well protected; and
(c) The contributions ASTRI received from industry per year. As an R&D institution begins to engage customers and starts building a valuable brand name to its customer base, the revenue from this base through services such as licensing and sales of technologies, design and product development services will increase. Industry contributions are perhaps the most challenging of the three targets.

During the period under review, the administration achieved impressive progress in implementing customer-focused R&D methodologies described above.

Technology Transfers

The number of technology transfers to industry has grown impressively. From a mere two in 2003/04 to 10 in 2004/05 and a total of 173 transfers (35 in 2006/07, 50 in 2007/08 and 88 in 2008/09) were completed from 2006/07 to 2008/09. The breakdown number of technology transfers by R&D Groups is tabulated below:

業績

目標

「顧客導向研發」的做法非常重要的一環是要嚴格地設立及監察可量化的業績目標。這些目標是對應科院的研發群組及其負責人進行年度工作評審的主要基準。這些目標在財政年度初訂立，繼而持續受到監察，以決定是否達標。應科院採納的三大可量化工作目標如下：

(a) 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；
(b) 每年申請和取得的專利數目及其成功率：專利是評估研發項目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；由於專利是應科院技術獲得妥善保護的保證，因此它也增加應科院對商業夥伴或客戶的吸引力；及
(c) 業界每年投入資金：隨著研發機構發展至對外找尋顧客，及在顧客心目中建立有價值的品牌，研發機構透過各種服務，如授權協議、技術轉售、設計及產品開發等服務，從顧客賺取的收入會有所增加。業界投入資金也許是三個目標中最富挑戰性的一個。

在過去財政年度，應科院行政管理層在實施上述「顧客導向研發」的經營模式方面取得令人矚目的進展。

技術轉移

應科院向業界轉移的技術數量顯著增長，由二零零三／零四年度僅兩項，增至二零零四／零五年度共十項，而二零零六／零七至二零零八／零九年度則共完成一百七十三項技術轉移（二零零六／零七年度三十五項，二零零七／零八年度五十項，及二零零八／零九年度八十八項）。各研發群組向業界轉移技術的數量表列於後：

R&D Group	群組	2006/07	2007/08	2008/09
Communications Technologies (CT)	通訊技術	6	14	41
Enterprise & Consumer Electronics (ECE)	企業與消費電子	15	16	15
IC Design (ICD)	集成電路設計	5	7	12.5
Material & Packaging Technologies (MPT)	材料與構裝技術	9	13	19.5
Total no. of technology transfers	技術轉移總數	35	50	88

The following table compares ASTRI's performance in R&D activities in the last three financial years.

下表比較過去三個財政年度應科院在研發工作方面的成績：

Performance of the R&D Programme	研發成績	2006/07	2007/08	2008/09
No. of ITF-funded platform projects undertaken	創新及科技基金資助的平台項目數量	26	33	42
No. of ITF-funded seed projects undertaken	創新及科技基金資助的種子項目數量	16	27	32
No. of technology transfers to industry in the form of:	以下列方式向業界轉移技術的數量：			
(1) ITF-funded collaborative projects undertaken	(1) 創新及科技基金資助的「業界合作項目」	0	0	6
(2) contract research projects undertaken	(2) 合約研究項目	20	33	56
(3) licensing agreements signed	(3) 簽訂授權協議	15	17	24
(4) IPs sold	(4) 出售知識產權	0	0	2
Total no. of technology transfers to industry	向業界轉移技術的總數	35	50	88

With ITC's guidance and support, we plan to further increase the number of transfers in 2009/10, which will include agreements related to technology licences and contract services, and Industry Collaborative Projects.

在創新科技署的指導和支持下，應科院計劃在二零零九／一零年度進一步增加技術轉移數量，當中包括技術授權與合約服務，以及「業界合作項目」。

Patents

Intellectual Properties, which include mainly patents and also hardware plus software reference designs and copyrights, are the most important asset for a publicly-funded R&D institution like ASTRI. On the one hand, they reflect innovation and inventiveness and serve as the foundation for ASTRI's most important business – transferring innovative technologies. On the other hand, legalized IP rights protect taxpayers' investments in ASTRI's R&D programmes. For these reasons, ASTRI sets up procedures for rigorous documentation and management of processes involved and establishes Patent Committees comprising technical and IP management specialists to review and screen each pending application for originality, feasibility and marketability to ensure filing of these patents are indeed necessary and advantageous.

專利

知識產權—包括硬件和軟件參考設計、版權及專利，是政府資助研發機構如應科院的最重要資產。一方面，這些知識產權反映創意及創造力，因此是應科院最重要業務—「創新技術轉移」的基石。另一方面，將知識產權作法定註冊可保障納稅人在應科院研發工作上的投資。基於這些理由，我們為所涉及的知識產權工作程序訂立了嚴謹的存檔及管理程序，並設立了由技術專家及知識產權專責同事組成的專利委員會，負責在原創性、可行性及市場性各方面，審核及篩選各項待辦申請，以確保申請有關專利是有具體效益及確實需要。

The number of patent applications filed by ASTRI has been growing rapidly. During the period 2006/07 to 2008/09, ASTRI filed 325 patents (112 in 2006/07, 99 in 2007/08 and 114 in 2008/09). The following table shows the number of patent applications and the breakdown by R&D Groups:

應科院申請的專利數目快速增加：於二零零六／零七至二零零八／零九年度期間，已申請三百二十五項專利（二零零六／零七年度一百一十二項，二零零七／零八年度九十九項，及二零零八／零九年度一百一十四項）。下表詳列各研發群組申請的專利數目：

R&D Group	群組	2006/07	2007/08	2008/09
Communications Technologies (CT)	通訊技術	31	21	23
Enterprise & Consumer Electronics (ECE)	企業與消費電子	18	10	20
IC Design (ICD)	集成電路設計	4	12	8
Material & Packaging Technologies (MPT)	材料與構裝技術	59	56	63
Total no. of patent applications filed in China, the U.S. and other countries	於中國、美國及其他國家申請的專利總數	112	99	114

Up till 31 March, 2009, 19 U.S. patents and two China patents have been granted to ASTRI. Generally, it may take up to four years for a patent to be granted. A list of ASTRI's patents is as follows:

直至二零零九年三月三十一日，應科院共獲授十九項美國專利及兩項中國專利。一般而言，要取得一項專利或需時四年。以下是應科院專利一覽：

	Patent Title 專利名稱	Patent Granting Date 取得專利日期	R&D Group 群組
1	Wideband Shorted Tapered Strip Antenna 寬帶錐形帶狀短天線	5 Apr 05 (U.S.) 二零零五年四月五日（美國）	CT 通訊技術
2	Multiband Branch Radiator Antenna Element 多頻帶分支輻射天線元件	31 Dec 05 (U.S.) 二零零五年十二月三十一日（美國）	CT 通訊技術
3	Low Cost, Multi-beam, Multi-band and Multi-diversity Antenna Systems and Methods for Wireless Communications 低成本、多波束、多頻帶及多重分集的無線通訊天線系統和方法	11 Jun 06 (U.S.) 二零零六年六月十一日（美國）	CT 通訊技術
4	Meander Feed Structure Antenna Systems and Methods 彎曲饋源結構的天線系統和方法	23 Oct 07 (U.S.) 二零零七年十月二十三日（美國）	CT 通訊技術
5	Efficient Lighting 節能照明	13 Nov 07 (U.S.) 二零零七年十一月十三日（美國）	MPT 材料與構裝技術
6	Photo-detectors and Optical Devices Incorporating Same 光電探測器及裝有光電探測器的光學設備	18 Dec 07 (U.S.) 二零零七年十二月十八日（美國）	MPT 材料與構裝技術
7	Location Positioning in Wireless Networks 在無線網絡中定位	25 Dec 07 (U.S.) 二零零七年十二月二十五日（美國）	CT 通訊技術

	Patent Title 專利名稱	Patent Granting Date 取得專利日期	R&D Group 群組
8	Location Determination and Location Tracking in Wireless Networks 在無線網絡中定位及跟蹤	15 Apr 08 (U.S.) 二零零八年四月十五日（美國）	CT 通訊技術
9	Systems and Methods for Managing Wireless Communications Using Link Space Information 利用鏈路空間資訊來管理無線通訊的系統和方法	29 Apr 08 (U.S.) 二零零八年四月二十九日（美國）	CT 通訊技術
10	Systems and Methods for Wireless Network Range Extension 擴大無線網絡範圍的系統和方法	23 Jul 08 (U.S.) 二零零八年七月二十三日（美國）	CT 通訊技術
11	Opto-Electronic Device for Optical Fibre Applications 用於光纖領域的光電設備	12 Aug 08 (U.S.) 二零零八年八月十二日（美國）	MPT 材料與構裝技術
12	Monitoring Devices and Intrusion Surveillance Devices 監控設備及入侵監視設備	19 Aug 08 (U.S.) 二零零八年八月十九日（美國）	MPT 材料與構裝技術
13	Configurable SIMD Processor Instruction Specifying Index to LUT Storing Information for Different Operation and Memory Location for Each Processing Unit 可配置SIMD處理器說明，指定LUT指數，就各處理器的不同操作及記憶位置儲存資訊	21 Oct 08 (U.S.) 二零零八年十月二十一日（美國）	ICD 集成電路設計
14	Heat Exchange Enhancement 增強熱交換	21 Oct 08 (U.S.) 二零零八年十月二十一日（美國）	MPT 材料與構裝技術
15	High Speed Context Memory Implementation for H.264 H.264高速環境記憶的實現	28 Oct 08 (U.S.) 二零零八年十月二十八日（美國）	ECE 企業與消費電子
16	Dynamic Allocation of Channels in a Wireless Network 動態分配無線網絡中的訊道	18 Nov 08 (U.S.) 二零零八年十一月十八日（美國）	ECE 企業與消費電子
17	Miniature Balanced Antenna with Differential Feed 帶不同饋源的微型平衡天線	18 Nov 08 (U.S.) 二零零八年十一月十八日（美國）	CT 通訊技術
18	Systems and Methods for Managing Wireless Communications Using Link Space Information 利用鏈路空間資訊來管理無線通訊的系統和方法	17 Dec 08 (China) 二零零八年十二月十七日（中國）	CT 通訊技術
19	System and Method for Providing Multimedia Wireless Message across a Broad Range and Diversity of Networks and User Terminal Display Equipment 在多個不同的網絡及用戶終端顯示設備之間提供多媒體無線訊息的系統和方法	17 Dec 08 (China) 二零零八年十二月十七日（中國）	ECE 企業與消費電子
20	Light Emitting Device 發光裝置	06 Jan 09 (U.S.) 二零零九年一月六日（美國）	MPT 材料與構裝技術
21	LED Assembly and use thereof LED裝配及相關用途	27 Jan 09 (U.S.) 二零零九年一月二十七日（美國）	MPT 材料與構裝技術

Industry Contributions

Industry contributions are perhaps the most challenging of ASTRI's three targets. Contributions are strongly linked and related to technology transfers. They require considerable maturity of R&D organisations and teams, as well as proven records of reliable services, before they can grow and expand substantially. To become proficient in this, ITC has set a target to generate industry contributions for platform projects to cover at least 10 per cent of the total project cost as per ITSP Guidelines.

During the year under review, industry contributions received for all projects amounted to $39.3 million, comprising 15.7 per cent of the total project cost. The following table shows that the contribution amount and percentage have been increasing over the last three financial years.

業界投入資金

業界投入資金可說是應科院每年設定的三項目標中最具挑戰性的一項。業界投入資金與技術轉移活動息息相關。要業界投入資金達至可觀數額，研發機構及其團隊需要有相當的經驗以及有提供可靠服務的往績。為了最終能有效達到此目標，創新科技署已訂下目標，按照《資訊及科技支援計劃指引》，平台項目帶來的業界投資金額至少須佔總項目成本的百分之十。

是年度所有項目從業界收到的投資總額為三千九百三十萬元，佔項目總成本百分之十五點七。下表顯示過去三年業界投入資金和佔總項目成本百分比持續攀升：

Fiscal Year 財政年度	Industry Contributions Received(HK$M)* 已收取的業界投入資金（百萬港元）*	Percentage of Total Project Cost 佔總項目成本百分比
2006/07	5.2	3.7%
2007/08	13.8	8%
2008/09	39.3	15.7%

*Including contract services income and in-kind contribution 包括合約服務收入及物資資助

The table below compares the industry contributions received by the four R&D Groups in the last two financial years.

下表列出四個研發群組過去兩個財政年度取得的業界投入資金：

R&D Group 群組	2007/08 (HK$M) （百萬港元）	2008/09 (HK$M) （百萬港元）
Communications Technologies (CT) 通訊技術	6.7	15.7
Enterprise & Consumer Electronics (ECE) 企業與消費電子	3.1	12.2
IC Design (ICD) 集成電路設計	1.3	2.6
Material & Packaging Technologies (MPT) 材料與構裝技術	2.7	8.6
Others 其他	-	0.2
Total industry contributions received* 已收取的業界投資總額*	13.8	39.3

*Including contract services income and in-kind contribution 包括合約服務收入及物資資助

Taking into consideration its latest track record, ASTRI should be able to continue generating significant contributions from industry for its R&D programmes in the future.

基於本年取得的成績，應科院在未來應能繼續以其研發項目，取得更可觀的業界投入資金。

People
人才匯聚

ASTRI firmly believes that it takes the combined efforts and dedication of each and every person, not only its R&D and administrative staff, but also the directors, advisors and supporters, to lead it to further success. ASTRI sees its people as the most precious asset and takes immense pride in their achievements and contributions.

應科院確信要取得進一步的成就，有賴於每位成員的共同努力和奉獻，不僅是研發和行政人員，也包括董事、顧問及支持者。應科院認為員工是最寶貴的資產，他們的成就與貢獻也是應科院最大的驕傲。

The New Chief Executive Officer

The new CEO, Dr. Cheung Nim-kwan, officially assumed office on 1 December, 2008.

Before joining ASTRI, Dr. Cheung was the Executive Consultant of Telcordia Technologies in the U.S. and the President of the international IEEE Communications Society in 2006 and 2007.

After receiving his B.Sc. (General) and B.Sc. (Special) degrees, both with First Class Honours, from the University of Hong Kong in 1969 and 1970 respectively, Dr. Cheung pursued further studies at the California Institute of Technology in the U.S, where he received his Ph.D. degree in Physics in 1976. He is Fellow of IEEE and Telcordia Technologies.

He joined Bell Laboratories upon graduation to conduct pioneering research in innovative single-mode fibre optic systems. In 1984, he became District Manager of Advanced Lightwave Technology in Bell Communications Research, where he created three world-class research programmes in high-speed, coherent and subcarrier-multiplex lightwave systems. In 1999, Dr. Cheung became Vice-President of Applied Research Government Programme in Telcordia Technologies. Under his leadership, the government-funded research programme portfolio grew at double-digit rate per year.

Since 2004, Dr. Cheung has been serving as a Consulting Professor in Electrical Engineering at Stanford University. He has also served on the Electrical Engineering Advisory Boards of Columbia University, Polytechnic University of New York and New Jersey Institute of Technology.

In 2006, Dr. Cheung was elected the 18th President of the IEEE Communications Society, an international professional organisation with 45,000 members in 180 chapters around the world. After completing his term, he served as Immediate Past President of the society providing assistance to the president.

Dr. Cheung has published more than 150 journals and has served in various editorial positions, including Editor-in-Chief of the renowned IEEE Communications Magazine.

新任行政總裁

新任行政總裁張念坤博士於二零零八年十二月一日正式上任。

加入應科院前，張博士是美國卓訊科技的行政顧問，並於二零零六至零七年出任國際電機及電子工程師學會（IEEE）通訊協會會長。

張博士於一九六九年及一九七零年在香港大學以一級榮譽取得理學士（全科）及理學士（專科）學位後，便前往美國加州理工學院深造，於1976年獲頒授物理學博士學位。張博士也是IEEE及卓訊科技的院士。

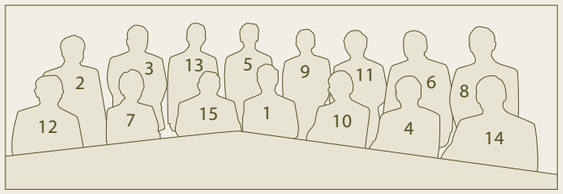
畢業後，張博士加入貝爾實驗室從事單模光纖系統的創新研究。於一九八四年出任貝爾通訊研究先進光波技術的區域經理，並拓展了三個世界級的研究項目，分別是高速、協調及多路通訊光波系統。一九九九年，張博士成為卓訊科技的政府應用研究項目副總裁。在他的領導下，政府資助的研究項目規模每年以雙位數字增長。

張博士自二零零四年起擔任史丹福大學電機工程系的顧問教授，他也曾應邀出任哥倫比亞大學、紐約理工大學、新澤西州理工學院的電機工程系顧問委員會成員。

二零零六年，張博士當選IEEE通訊協會第十八任會長。IEEE通訊協會是一個國際性的專業機構，共有四萬五千名會員分佈於全球一百八十個分部。他在完成任期之後，以卸任會長的身份繼續協助現任會長拓展會務。

張博士曾發表超過一百五十篇學術論文，並曾為多個專業期刊擔任編輯工作，包括曾為著名的IEEE通訊雜誌擔任總編輯。

Board of Directors
董事局成員



Effective 21 October, 2008, the Board of Directors is:

Chairman
Dr. Patrick Wang Shui-chung, JP [1]

Members (In alphabetical order)
Mr. Anthony Au Wai-hung, BBS [2]
Mr. Sunny Chai Ngai-chiu [3]
Prof. Philip Chan Ching-ho [4]
Prof. Chew Weng-cho [5]
Dr. Patrick Lam See-pong [6]
Mr. Henry Leung Kwong-han
Mr. Humphrey Leung Kwong-wai
Dr. Jacqueline Lui Chiu-tong [7]
Mr. Roger Luk Koon-hoo, BBS, JP
Mr. Victor Ng Kwok-ho [8]
Prof. Vincent Y. Shen [9]
Mr. Richard Sun Po-yuen [10]
Mr. Ben Wong Chung-mat, MH [11]
Mr. Peter Wong King-fai [12]
Mr. Luther Wong Lok-tak [13]

Official Members
Mr. Eddy Chan Yuk-tak, JP, Commissioner for Innovation and Technology [14]
Mr. Duncan W. Pescod, JP, Permanent Secretary for Commerce and Economic Development (Communications and Technology) [15]

由二零零八年十月二十一日起，應科院董事局全體成員名單如下：

主席
汪穗中博士，JP [1]

董事（以英文姓氏次序排列）
區煒洪先生，BBS [2]
查毅超先生 [3]
陳正豪教授 [4]
周永祖教授 [5]
林師龐博士 [6]
梁廣恆先生
梁廣偉先生
呂許昭棠博士 [7]
陸觀豪先生，BBS，JP
吳國豪先生 [8]
沈運申教授 [9]
孫寶源先生 [10]
王忠秣先生，MH [11]
黃景輝先生 [12]
王樂得先生 [13]

官守董事
陳育德先生，JP，創新科技署署長 [14]
柏志高先生，JP，商務及經濟發展局常任秘書長（通訊及科技）[15]

In October 2008, ASTRI welcomed five new members to the Board. They are Mr. Anthony Au Wai-hung, Prof. Philip Chan Ching-ho, Prof. Chew Weng-cho, Mr. Victor Ng Kwok-ho and Mr. Luther Wong Lok-tak.

Mr. Anthony Au Wai-hung is Managing Director of Futuresuccess Consultants Ltd. He was a member of ITF's SERAP Project Assessment Panel, a representative/member of the Small and Medium Enterprises Committee and a member of the Small and Medium Enterprises Development Fund Vetting Committee.

Prof. Philip Chan Ching-ho is the Dean of Engineering and a Chair Professor of the Department of Electronic and Computer Engineering, the Hong Kong University of Science and Technology. He is a member of the Technology Review Panels and the Domain Advisory Committees of IC Design Group and the Material & Packaging Technologies Group.

Prof. Chew Weng-cho is Dean of the Faculty of Engineering and Chair of Electromagnetics of the Department of Electrical and Electronic Engineering, the University of Hong Kong.

Mr. Victor Ng Kwok-ho, the founder and Managing Director of Micom Tech Ltd, is a member of the Technology Review Panels and the Domain Advisory Committees of Enterprise & Consumer Electronics Group and IC Design Group. Mr Ng is also a member of ITC's DesignSmart Initiative Assessment Panel and ITF's SERAP Project Assessment Panel.

Mr. Luther Wong Lok-tak is Managing Director of C&G Environmental Technology Ltd. He is currently one of the Vice Presidents of the Hong Kong Small and Medium Enterprises General Association. He is also a member of ITF's SERAP Project Assessment Panel, a General Committee Member of the Chinese Manufacturers' Association of Hong Kong and Chairman of its Environmental Technology Subcommittee.

"We are happy to welcome these five accomplished individuals to the Board," said Board Chairman Dr. Patrick Wang Shui-chung. "Their appointments will strengthen relationship between ASTRI, industry and academia, and help enhance the development of R&D efforts relating to information and communications technologies," Dr. Wang added.

Retiring from the Board are Dr. Roy Chung Chi-ping, Mr. Tom Tang Chung-yen, Mr. Henry Tsang Yuk-wong and Prof. Wong Wing-shing. Dr. Wang thanked the departing members for their tremendous contributions while serving on the Board.

二零零八年十月，應科院迎來五名新董事局成員，他們分別是區煒洪先生、陳正豪教授、周永祖教授、吳國豪先生及王樂得先生。

區煒洪先生是Futuresuccess Consultants Ltd的董事總經理。他也是創新及科技基金小型企業研究資助計劃評審委員會成員、中小企委員會代表以及中小企發展基金評審委員會會員。

陳正豪教授是香港科技大學工程學院院長及電子及計算機工程學系講座教授。陳教授也是現任集成電路設計群組及材料與構裝技術群組的科技評審委員會及群組顧問委員會成員。

周永祖教授是香港大學工程學院院長及電機電子工程學系之電磁學講座教授。

吳國豪先生是捷訊電腦科技有限公司的創辦人及董事總經理。他是現任企業與消費電子群組及集成電路設計群組的科技評審委員會及群組顧問委員會成員。吳先生也是創新科技署設計智優計劃、創新及科技基金小型企業研究資助計劃的評審委員。

王樂得先生現任香港思捷環境科技有限公司董事總經理。他也是香港中小型企業聯合會其中一位副會長、創新及科技基金小型企業研究資助計劃評審委員會成員及香港中華廠商聯合會會董及其環保業小組主席。

應科院董事局主席汪穗中博士表示：「本人謹代表應科院董事局歡迎五位在社會上取得卓越成就的人士加入。我深信是次委任將加強應科院與業界及學術界的聯繫，有助推進應科院於資訊及通訊科技上的研發工作。」

離任的應科院董事局成員分別為鍾志平博士、唐慶年先生、曾玉煌先生及黃永成教授。汪博士對他們過去作出的貢獻表示感謝。

Movements of Directors
董事局成員變動

New Directors 新委任董事	Appointed Date 委任日期
Mr. Anthony Au Wai-hung, BBS 區煒洪先生，BBS	21 October, 2008 二零零八年十月二十一日
Prof. Philip Chan Ching-ho 陳正豪教授	21 October, 2008 二零零八年十月二十一日
Prof. Chew Weng-cho 周永祖教授	21 October, 2008 二零零八年十月二十一日
Mr. Victor Ng Kwok-ho 吳國豪先生	21 October, 2008 二零零八年十月二十一日
Mr. Duncan W. Pescod, JP (Official) 柏志高先生，JP（官守）	19 August, 2008 二零零八年八月十九日
Mr. Luther Wong Lok-tak 王樂得先生	21 October, 2008 二零零八年十月二十一日
Retired Directors 退任董事	**Retiring Date 退任日期**
Dr. Roy Chung Chi-ping, JP 鍾志平博士，JP	21 October, 2008 二零零八年十月二十一日
Mrs. Rita Lau Ng Wai-lan, JP (Official) 劉吳惠蘭女士，JP（官守）	12 July, 2008 二零零八年七月十二日
Mr. Tom Tang Chung-yen, JP 唐慶年先生，JP	21 October, 2008 二零零八年十月二十一日
Mr. Henry Tsang Yuk-wong 曾玉煌先生	21 October, 2008 二零零八年十月二十一日
Prof. Wong Wing-shing 黃永成教授	21 October, 2008 二零零八年十月二十一日
Alternate Directors 替代董事	**Appointed Period 任期**
Mr. Eddy Chan Yuk-tak, JP 陳育德先生，JP	Appointed on 19 August, 2008 as alternate to Mr. Duncan W. Pescod 二零零八年八月十九日委任替代柏志高先生
Mr. Andrew Lai Chi-wah 黎志華先生	Appointed on 5 February, 2009 as alternate to Mr. Eddy Chan Yuk-tak 二零零九年二月五日委任替代陳育德先生
Mr. Gordon Leung Chung-tai 梁松泰先生	Appointed on 30 November, 2007 and retired on 5 February, 2009 as alternate to Mr. Eddy Chan Yuk-tak 二零零七年十一月三十日委任替代陳育德先生 二零零九年二月五日退任
Mr. Alan Siu Yu-bun (Acting Official) 蕭如彬先生（署理官守）	Appointed on 29 July, 2008 and retired on 18 August, 2008 as alternate to Mrs. Rita Lau Ng Wai-lan 二零零八年七月二十九日委任替代劉吳惠蘭女士 二零零八年八月十八日退任

A Growing Workforce

In the year under review, the Human Resources Department continued to support ASTRI in recruiting staff from different parts of the world. As at 31 March, 2009, the total ASTRI workforce stood at 475. The number of R&D staff increased by 60 (17 per cent) to 405 while the Headquarters added nine new staff.

茁壯的人力資源

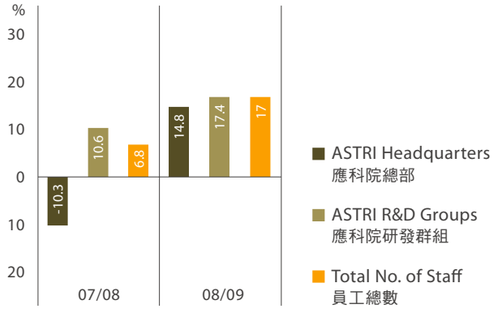
過去一年，人力資源部繼續為公司從世界各地招聘人才。截至二零零九年三月三十一日，應科院員工總數為四百七十五人。研發人員增加了六十人（增幅達百分之十七）至四百零五人，同時總部新增了九名員工。

ASTRI R&D Groups 應科院研發群組 +17.4%		
Level 職級	As at 31 March, 2008 截至二零零八年三月三十一日	As at 31 March, 2009 截至二零零九年三月三十一日
1	3	3
2	17	20
3	68	77
4	165	183
5	89	114
6	3	3
Intern 實習研究員	-	5
Total 總數	345	405

ASTRI Headquarters 應科院總部 +14.8%		
Level 職級	As at 31 March, 2008 截至二零零八年三月三十一日	As at 31 March, 2009 截至二零零九年三月三十一日
1	2	2
2	1	3
3	10	11
4	21	23
5	21	25
6	5	6
Intern 實習研究員	1	-
Total 總數	61	70

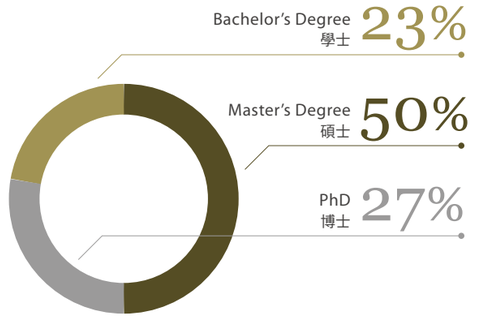
Percentage Growth of ASTRI Staff
應科院員工增長百分比

(As at 31 March, 2009 截至二零零九年三月三十一日)



Academic Qualification of R&D Staff
研究人員學歷

(As at 31 March, 2009 截至二零零九年三月三十一日)



ASTRI Career Day 2008

In October 2008, the Government introduced the Internship Programme providing opportunities for local university graduates to acquire research and industrial experience by participating in R&D projects funded by the Innovation and Technology Fund.

Responding to this programme, ASTRI held its first ever Career Day at the Hong Kong Science Park on 28 March, 2009, offering the latest information regarding employment opportunities at ASTRI for engineering and science graduates. The event was highly successful, attracting more than 200 participants and over 150 job applications. At the time of reporting, five interns have joined the ASTRI workforce and more are expected to start work in the coming months.

Dr. Cheung answering questions from participants.
張念坤博士細心解答參與者的提問。

應科院就業諮詢日

二零零八年十月，政府推出實習研究員計劃，為本地大學畢業生提供就業機會，讓他們透過參與創新及科技基金資助的研發項目，累積研究及產業經驗。

A big turnout for the Career Day organised for the first time.
「就業諮詢日」首次舉行，與會者甚為踴躍。

應科院積極回應此項計劃，並於二零零九年三月二十八日假香港科學園舉辦首次就業諮詢日，為本地大學的工程及理科畢業生提供應科院最新的就業資訊。是次活動圓滿成功，吸引超過二百人參與，同時收到逾一百五十多份職位申請。在撰寫報告的時候，應科院已聘用了五位實習研究員，並期待未來數月將有更多實習研究員參與工作。

Words of ASTRI Ambassadors 應科院青年大使心聲

[Left 左]

It's all about doing high quality research with brilliant people and excellent facilities.
「總括在應科院的工作，就是利用最先進的設施，與最優秀的人才合作，來進行高水平研究。」

Irene Cheung, Senior Engineer (Joined in 2006)
PhD Physics and Materials Science, CityU (HK)
張燕冰 高級工程師 (二零零六年入職)
香港城市大學物理及材料科學哲學博士

[Right 右]

ASTRI is an ideal place for young engineers to learn, grow and get well-equipped for career development.
「應科院是讓年輕工程師學習、成長、為事業打造良好基礎的理想地方。」

Billy Chan, Senior Engineer (Joined in 2006)
Postdoctoral Fellow, Electronic Engineering, University of Washington
PhD Electrical and Electronic Engineering, HKUST
陳少平 高級工程師 (二零零六年入職)
華盛頓大學電子工程博士後
香港科技大學電機及電子工程哲學博士

Honours for Staff

Anti-counterfeit goods and quality assurance system won Best Life Style Bronze Award

In the Hong Kong ICT Award 2008, the "Anti-counterfeit Goods and Quality Assurance System" developed by ASTRI was selected winner of Best Life Style Bronze Award due to its value in addressing the specific problem of counterfeit prevention for goods sold in market.

The System focuses on Near Field Communications (NFC) technology. It is fully functional with Antenna, NFC Tag, NFC Reader, Firmware, Network Management and Application Software and is used to determine if a product is counterfeit or authentic.

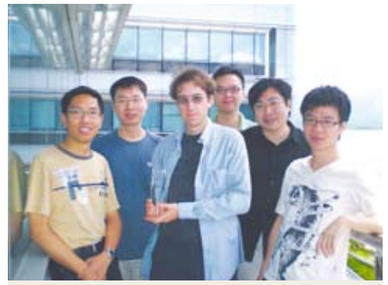
The Communications Technologies Group was in charge of the project. Led by Mr. Corbett Rowell, R&D Director of Antenna and RF, members from three teams contributed efforts to make the project a success. They include Mr. Alex Mui Ka-ho from Customizable Wireless Management team, Mr. Xu Lei, Mr. Thomas Guo Xuefeng, Mr. Liu Shujun and Mr. Peng Mingjie from Practical MIMO team, and Mr. Andrew Hon Man-ming and Dr. Terry Lai Hau-wah from Antenna and RF team.

Mr. Corbett Rowell (right) receiving the award from the organiser.
柳江平先生（右）從主辦機構代表手中接過獎項。

員工的卓越成就

無線防偽及品質保證平台榮獲最佳生活時尚獎銅獎

在二零零八年舉行的「香港資訊及通訊科技獎」中，應科院開發的無線防偽及品質保證平台榮獲「最佳生活時尚獎」銅獎，其防止偽造商品在市場上販售的卓越創意與技術成就受到表揚。



The award-winning team (from left to right): Mr. Xu Lei, Dr. Terry Lai, Mr. Corbett Rowell, Mr. Andrew Hon, Mr. Alex Mui and Mr. Peng Mingjie.
獲獎團隊（由左至右）：徐雷先生、黎孝華博士、柳江平先生、韓文明先生、苗家豪先生及彭明杰先生。

該平台是建基於近場通訊技術(NFC)，由先進的天線設計、NFC標籤、NFC讀取器、韌體、網管軟體以及應用軟體組成。用戶可以透過NFC讀取器以判斷所欲購買的商品是否偽造。

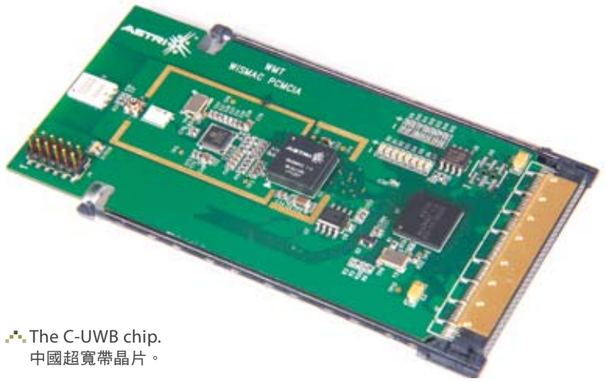
此研發項目由通訊技術群組負責，在研發總監柳江平領導下，合三個技術組的努力而研發成功。成員包括來自定制無線網絡管理系統組的苗家豪先生；實用多天線組的徐雷先生、郭學峰先生、劉樹軍先生、彭明杰先生；及天線與射頻技術組的韓文明先生及黎孝華博士。

Best Innovation Award from NITS for recognition of ASTRI's contribution to C-UWB technology development in China

ASTRI received the Best Innovation Award from WPAN Working Group of China National Information Technology Standardization Technical Committee (NITS). NITS is the largest standardization technical committee on the Mainland primarily responsible for standard development in the field of information technology.

The award was presented to ASTRI due to its significant contributions to the development of C-UWB technology and standards. The acknowledgement from NITS demonstrates ASTRI's competitive position in China WPAN technology and standard development.

This is the second time that ASTRI received the award after winning the honour in 2007 with CWPAN technology. Mr. Bill Zhang Weimin from the Communications & Technologies Group (CT) is the leader and key person in CWPAN technology and standard development. Dr. Ding Quanlong is the representative of CT in C-UWB.



The C-UWB chip.
中國超寬帶晶片。

Mr. Bill Zhang (right) and his team won the Award in 2007.
張為民先生(右)及其團隊於二零零七年獲獎。

Dr. Ding Quanlong (middle) and teammates pose with trophy in hand.
丁泉龍博士(中)與組員手持獎座合照。

應科院獲信標委頒發優秀開拓獎，表揚為發展中國超寬帶技術作出貢獻

應科院獲得全國信息技術標準化技術委員會（信標委）之無線個人區域網路（WPAN）工作小組頒發「優秀開拓獎」。信標委是全中國最大的標準化技術委員會，負責通訊技術標準化的發展。

此獎項表揚應科院在中國超寬帶（C-UWB）技術發展及標準化上所作之貢獻。今次能夠得到信標委的認同亦表明了應科院在發展中國WPAN標準化方面的優勢。

這次是應科院繼中國低速無線個人區域網路（CWPAN）榮獲二零零七年信標委「優秀開拓獎」之後，第二次獲得該獎項。來自通訊技術群組的張為民先生是CWPAN技術及標準化的領導及主要負責人。丁泉龍博士則是應科院參與C-UWB工作組的代表。

MPT successfully develops the smallest projection module in the world.
材料與構裝技術群組成功開發全球最小投影模組。

LED Pico-Projector won Innovative Product Award

During 2008, Material & Packaging Technologies Group developed a personal portable LED Pico-Projector, which won the "Innovative Product Award" of China's Second National Solid State Lighting Innovation Contest at the fifth China International Solid State Lighting Symposium in Shenzhen.

The 3cm x 3cm projector when connected to a computer or mobile phone can project an image of seven to 15 inches. This device can be used in conference rooms without requiring any projection facilities.

微型LED光源投影機榮獲產品創新獎

材料與構裝技術群組研發的個人可攜式LED光源投影機，在深圳舉行的第五屆中國國際半導體照明論壇暨展覽會之「第二屆國家半導體照明產品及應用創新大賽（2008）」中，榮獲「產品創新獎」。

此三厘米乘三厘米的微型投影機可接駁至電腦或手提電話投射出七至十五吋的影像，可在無投影設備之會議室內使用。

The award-winning team (from the right): Dr. Wu Enboa, Mr. Cheung Hon-lung, Ms. Anna Liu Ying, Ms. Amy Au Yeung Mei-sze, Dr. Tsai Chenjung and Mr. Scott Chen Shoulung.
獲獎團隊（右起）：吳恩柏博士、張瀚龍先生、劉穎小姐、歐陽美思小姐、蔡振榮博士及陳守龍先生。

Words of ASTRI Ambassadors 應科院青年大使心聲

[Left 左]

I am optimistic about the prospect of my career with the knowledge and experience I gained at ASTRI.
「從應科院得到的知識和經驗，令我對事業前途充滿信心。」

Trevor Ng , Senior Engineer (Joined in 2003)
MSc Telecommunications, HKUST
吳俊彥 高級工程師 (二零零三年入職)
香港科技大學電訊理學碩士

[Right 右]

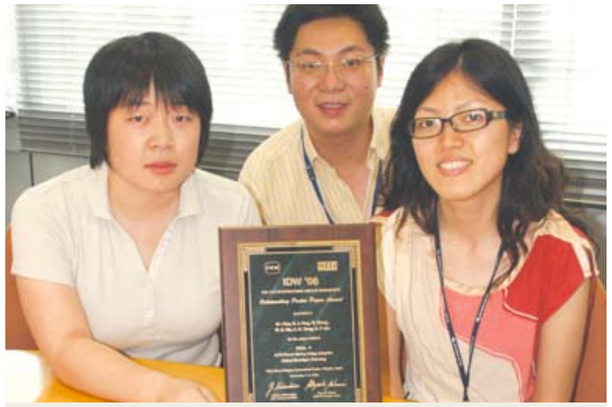
Working at ASTRI is like going back to the university. We all enjoy the good work relationship that we share.
「與同事合作無間，群策群力，令我感覺好像回到了大學校園。」

Samantha Chan , Engineer (Joined in 2006)
MPhil Electronic Engineering, HKUST
陳筱敏 工程師 (二零零六年入職)
香港科技大學電子工程哲學碩士

IDW Outstanding Poster Paper Award

Another research team of the Material & Packaging Technologies Group won the "IDW Outstanding Poster Paper Award" at the 15th International Display Workshop (IDW) held in Niigata, Japan for its innovative power-saving liquid crystal display (LCD) with the research paper entitled "LCD Power Saving Using Adaptive Global Backlight Dimming".

Under the supervision of Vice President and Group Director Dr. Wu Enboa, and Director Dr. Tsai Chenjung, the research team, including engineers Dr. Chen Min, Ms. Wendy Zhang Wei and Ms. Michelle Niu Wei-hong, have devoted more than two years of consolidated efforts in developing the innovation from theory to algorithm design to implementation. ASTRI has filed more than seven U.S. patents regarding the novel technique.



(From the left) Ms. Wendy Zhang, Dr. Chen Min and Ms. Michelle Niu are pleased in winning the award after two years of hard work.
（左起）張瑋女士、陳珉博士及牛偉紅女士經兩年努力而獲得獎項喜上眉稍。

IDW傑出展示論文獎

材料與構裝技術群組轄下另一隊研究小組，在日本新潟縣舉行的第十五屆國際顯示器會議中奪得「IDW傑出展示論文獎」。該篇論文題為「基於自適應性全屏動態背光的液晶顯示節能技術」。

該研究小組在副總裁及研發群組總監吳恩柏博士和總監蔡振榮博士的指導下，工程師陳珉博士、張瑋女士及牛偉紅女士等人花了兩年多時間合力把該創新意念由理論發展成演算系統，繼而付諸實行。應科院已為是項新技術提交了逾七項美國發明專利申請。

Words of ASTRI Ambassadors 應科院青年大使心聲

[Left 左]

ASTRI has a very strong team of professionals with high education and international experience.
「應科院擁有一支非常出色，具備良好教育背景和國際經驗的優秀團隊。」

Peter Cheng, Engineer (Joined in 2005)
Bachelor Engineering Science,
University of Toronto
鄭嘉駿 工程師 (二零零五年入職)
多倫多大學工程科學學士

[Right 右]

I think ASTRI provides a perfect environment for nurturing talents which is not usually found in other companies.
「應科院是本港少數為孕育科技人才提供理想環境的公司。」

Gigi Chan, Engineer (Joined in 2007)
MSc Electronic Engineering, HKUST
陳桂枝 工程師 (二零零七年入職)
香港科技大學電子工程理學碩士

External Appointments

External appointments held by executives / engineers for the period 1 April, 2008 to 31 March, 2009

外界任命

下列為部分行政職員/工程師在二零零八年四月一日至二零零九年三月三十一日期間獲外界委任的職務。

Dr. Cheung Nim-kwan
Chief Executive Officer

- Member of Judging Panel, 2009 Bauhinia Cup Outstanding Entrepreneur Awards, The Hong Kong Polytechnic University
- Member of Judging Panel, CityU Research Excellence Award 2009
- Member of Hong Kong Trade Development Council Innovation and Technology Advisory Committee
- Member of HKTDC Electronics/ Electrical Appliances Industries Advisory Committee
- Programme Committee Member, Hong Kong International Computer Conference 2009

張念坤博士
行政總裁

- 香港理工大學
  二零零九年紫荊花杯傑出企業家獎
  審定委員
- 香港城市大學
  二零零九年傑出研究獎
  評審委員會成員
- 香港貿易發展局
  創新及科技諮詢委員會成員
- 香港貿易發展局
  電子及電器產品業諮詢委員會成員
- 二零零九年香港國際電腦會議
  程序委員會成員

Prof. Edward Yang
Senior Advisor to CEO

- Director of Semiconductor Manufacturing International Corporation
- Adjunct Professor, Faculty of Engineering, Chinese University of Hong Kong
- Honorary Professor, Department of Electrical and Electronic Engineering, Hong Kong University

楊雄哲教授
資深顧問

- 中芯國際集成電路製造有限公司
  獨立非執行董事
- 香港中文大學
  工程學院客席教授
- 香港大學
  電機電子工程學系榮譽教授

Dr. I Chih-lin
Vice President and Group Director

- Member of HKSAR Digital 21 Strategy Advisory Committee, Commerce and Economic Development Bureau, Hong Kong
- Member of Task Force on Facilitating the Adoption of Wireless and Mobile Services and Technology, Office of the Government Chief Information Officer, Hong Kong
- Assessment Panel for Entrepreneur Research Assistance Programme, Innovation and Technology Commission, Hong Kong
- Co-Chair, Steering Committee, Hong Kong Digital Terrestrial Television Local Testing Group
- Co-Chair, Steering Committee, Hong Kong WiMax (BWA) /DTV Industry Consortium

易芝玲博士
副總裁及研發群組總監

- 香港商務及經濟發展局
  香港特區數碼21資訊科技策略
  諮詢委員會成員
- 香港政府資訊科技總監辦公室
  促進無線和移動服務和技術採用
  工作隊成員
- 香港創新科技署
  評估企業研究資助計劃小組成員
- 香港數碼地面電視廣播測試組織
  督導委員會聯席主席
- 香港WiMax（寬頻無線接入）／數碼電視產業聯盟
  督導委員會聯席主席

Dr. I Chih-lin
Vice President and Group Director (con't)

- Member of Advisory Committee, Wireless Communications Test Lab, Hong Kong Science and Technology Parks
- Member of Ubiquitous City Steering Committee, Hong Kong Wireless Technology Industry Association
- Member of TD-SCDMA Program Steering Committee, Hong Kong Wireless Technology Industry Association
- Council Member, Internet Professional Association, Hong Kong
- Chief Judge, Best Innovation and Research, Hong Kong ICT Award
- Chair, Advisory Committee, Electronic and Computer Engineering, Hong Kong University of Science and Technology
- Member of Advisory Committee, Electrical and Electronics Engineer, University of Hong Kong
- Member of Advisory Committee, Information Engineering, Chinese University of Hong Kong
- Chair, Steering Committee, ASTRI-Tsinghua University Multimedia Broadcast Communication Joint Lab
- Visiting Researcher/ Professor, Chinese Academy of Science, China
- Member of Steering Committee, Research Institute of Information Technology, Tsinghua University

易芝玲博士
副總裁及研發群組總監（接前頁）

- 香港科技園無線通訊測試實驗室
  諮詢委員會成員
- 香港無線科技商會
  無處不在城市項目督導委員會成員
- 香港無線科技商會
  TD-SCDMA項目督導委員會成員
- 香港互聯網專業協會
  理事會成員
- 香港信息和通訊技術獎
  最佳創新及研究評審組
  首席評判
- 香港科技大學
  電子和計算機工程諮詢委員會主席
- 香港大學
  電機電子工程學系諮詢委員會成員
- 香港中文大學
  信息工程諮詢委員會成員
- 應科院–清華大學多媒體廣播與通訊聯合實驗室
  督導委員會主席
- 中國科學院
  客席研究員/教授
- 清華大學信息技術研究院
  督導委員會成員

Dr. Wu Enboa
Vice President and Group Director

- Expert of Department of Science and Technology, Fujian Province, China
- External Expert of Solid State Lighting Technology Development, China's 12th Five Year Plan
- Expert of Economic Development, Yuqing in Guizhou Province, China
- Member of China Solid State Lighting Alliance and Expert for Greater China Region Development

吳恩柏博士
副總裁及研發群組總監

- 中國福建省科技廳專家
- 中國十二五計劃
  半導體照明應用
  外部專家
- 中國貴州省餘慶縣
  經濟發展顧問
- 中國半導體照明研發及產業聯盟
  理事及兩岸三地協調策進專家

Dr. Tom Chung Chang-hwa
Vice President and R&D Director

- Expert of Guangdong Advanced Microelectronics Packaging and Testing Engineering Technology Centre, China
- Vice President, China Electronics Packaging Society

仲鎮華博士
副總裁及研發總監

- 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
- 中國電子學會
  生產技術學分會
  副理事長

Dr. Tom Chung Chang-hwa
Vice President and R&D Director (con't)

- Vice Chair and Technical Chair of International Conference on Electronic Packaging Technology & High Density Packaging 2008
- DAC Member of Manufacturing Engineering and Engineering Management Department, City University of Hong Kong

仲鎮華博士
副總裁及研發總監（接前頁）

- 二零零八年中國電子封裝技術和高密度封裝國際會議
  副主席及技術委員會主席
- 香港城市大學
  製造工程及工程管理學系
  學系顧問委員會成員

Dr. Ding Quanlong
Director

- Chair of work group, IGRS-UWB, Intelligent Grouping and Resource Sharing Alliance, China
- Group Leader of C-UWB PHY standard, WPAN Working Group, NITS, China
- Technical Chair, Wimedia China, Wimedia Alliance

丁泉龍博士
總監

- 中國閃聯聯盟
  IGRS-超寬帶工作組
  召集人
- 全國信息技術標準化
  無線個域網工作組
  C-UWB物理層標準工作組組長
- WiMedia聯盟
  WiMedia中國分會
  技術組主席

Mr. Li Yiu-kei
Director

- Fellow, Hong Kong Association for the Advancement of Science and Technology

李耀基先生
總監

- 香港科技協進會
  資深會員

Words of ASTRI Ambassadors 應科院青年大使心聲

[Left 左]

If you have a passion for innovation and enjoy taking challenges, ASTRI is definitely the place for you.
「如果您熱愛創新科技，勇於接受挑戰，歡迎您加入我們的行列。」

Iris Sit , Engineer (Joined in 2007)
MPhil Applied Physics & Material Science, City U (HK)
薛萍 工程師 (二零零七年入職)
香港城市大學物理及材料科學哲學碩士

[Right 右]

My job at ASTRI has enriched my profile and widened my horizon.
「從工作中累積寶貴經驗，擴闊視野，使我獲益良多。」

Lydia Leung, Manager (Joined in 2005)
PhD Electrical and Electronic Engineering, HKUST
梁立慧 經理 (二零零五年入職)
香港科技大學電機及電子工程哲學博士

Dr. Daniel Shi Xunqing
Director
- Co-Chair, Technical Program Committee, International Conference of Electronics Packaging Technology 2009, China
- Adjunct Professor, Peking University, China

史訓清博士
總監
- 中國二零零九年電子封裝技術國際會議技術委員會副主席
- 北京大學客席教授

Mr. Li Yangang
Senior Manager
- Co-director, ASTRI-Tsinghua University Multimedia Broadcast Communication Joint Lab
- Steering Committee Member, ASTRI-Tsinghua University Multimedia Broadcast Communication Joint Lab

李彥剛先生
高級經理
- 應科院–清華大學多媒體廣播與通訊聯合實驗室副總監
- 應科院–清華大學多媒體廣播與通訊聯合實驗室督導委員會成員

Dr. Liu Xinyi
Senior Manager
- External Patent Reviewer, City University of Hong Kong

劉辛怡博士
高級經理
- 香港城市大學外部專利評審成員

Mr. Edwin Cheung Wai-ming
Manager
- Chapter Secretary, Components, Packaging and Manufacturing Technology, Hong Kong Chapter Executive Committee, IEEE
- Technologies Committee Member, Hong Kong Electronics & Technologies Association

張偉明先生
經理
- 電機及電子工程師學會電子元件封裝製造技術香港分會執行委員會成員分會祕書
- 香港電子科技商會科技委員會成員

Dr. Pan Zhengang
Manager
- Founder and Chair, Broadband Wireless Multimedia MIMO Study Group, Chinese National Information Technology Standardization, China
- Visiting Associate Professor, Chinese Academy of Science, China
- Member of Technical Program Committee of GlobalCom2009, IEEE
- Member of Technical Program Committee of ICC2009, IEEE

潘振崗博士
經理
- 全國信息技術標準化技術委員會寬帶無線多媒體MIMO技術研究組創始人及主席
- 中國科學院客席副教授
- 電機及電子工程師學會二零零九年世界通訊技術計劃委員會成員
- 電機及電子工程師學會二零零九年ICC技術計劃委員會成員

Dr. Ivan Sham Man-lung
Manager
- Chairman, Components, Packaging and Manufacturing Technology, Hong Kong Chapter, IEEE
- Visiting Lecturer, Hong Kong University of Science and Technology for the period February to December 2008

沈文龍博士
經理
- 電機及電子工程師學會電子元件封裝製造技術香港分會會長
- 香港科技大學客席講師（二零零八年二月至十二月）

Mr. Frank Fang Zuyuan
Principal Engineer
- Co-chair of Membership Committee, Hong Kong Chapter, Association for Computing Machinery

方祖元先生
主任工程師
- 美國計算機協會香港分會會員委員會副主席

Dr. Zhou Yiqing
Principal Engineer
- Visiting Associate Professor, Chinese Academy of Science, China
- Visiting Assistant Professor, University of Hong Kong
- Co-Chair of International Workshop on Advanced Wireless Access Technology for IMT-A of ACCESSNETS 2009, Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering

周一青博士
主任工程師
- 中國科學院客席副教授
- 香港大學客席助理教授
- 計算機科學社會信息學和電信工程學院二零零九年接入網IMT-A先進無線接入技術國際研討會聯席主席

Mr. Charles Kuan Shui-lung
Senior Engineer
- Technologies Committee Member, Hong Kong Electronics & Technologies Association

關瑞龍先生
高級工程師
- 香港電子科技商會科技委員會成員

Dr. Danny Ong Chungyen
Consultant
- Steering Committee Member, ASTRI-Tsinghua University Multimedia Broadcast Communication Joint Lab

翁中淹博士
顧問
- 應科院–清華大學多媒體廣播與通訊聯合實驗室督導委員會成員

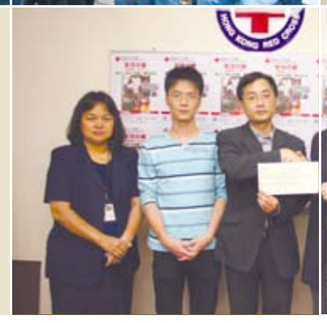
Staff meeting held to strengthen internal communications between staff and management.
舉行職員大會，增強員工及管理層之間的溝通。

Christmas party organised for staff to celebrate the festive season.
舉行聖誕派對，慶祝佳節來臨，全體員工共渡歡樂時刻。

Offering career opportunities in R&D for graduates.
為有志從事科研的畢業生提供就業機會。

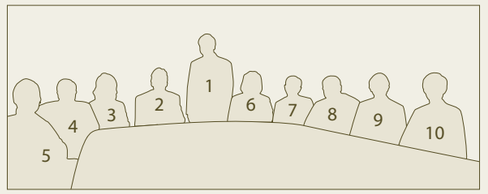
Friendship building through participation in outdoor activities.
齊來參與戶外活動，增進友誼。

Company-wide donation drive for Sichuan earthquake victims.
員工為四川地震災民慷慨解囊。



ASTRI's Senior Executives
應科院高級行政人員

(As at 31 March, 2009 截至二零零九年三月三十一日)



1 Dr. Cheung Nim-kwan, Chief Executive Officer
行政總裁 張念坤博士

2 Dr. Manuel F. Costa, Chief Technology Officer
首席科技總監 郭文偉博士

3 Ms. Betty Law, Chief Finance Officer
首席財務總監 羅翠萍女士

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

5 Ms. Anita Ho, Human Resources Director
人力資源部總監 何寶瑛女士

6 Dr. I Chih-lin, Vice President and Group Director, Communications Technologies Group
通訊技術群組 副總裁及研發群組總監 易芝玲博士

7 Mr. David Kwong, Vice President and R&D Director, IC Design Group
集成電路設計群組 副總裁及研發總監 鄺國權先生

8 Mr. Li Yiu-kei, Director, IC Design Group
集成電路設計群組 總監 李耀基先生

9 Dr. Chao Shen-chang , 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 趙盛章博士

10 Dr. Wu Enboa , 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 吳恩柏博士

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

(For the year ended 31 March, 2009 全年截至二零零九年三月三十一日止)

Post 職級	Annual Remuneration 1 Apr 2008 - 31 Mar 2009 (HK$) 由二零零八年四月一日至 二零零九年三月三十一日全年薪酬（港元）
Interim Chief Executive Officer (1 Apr 2008 - 8 Jan 2009) 暫代行政總裁（二零零八年四月一日至二零零九年一月八日）	2,765,259
Chief Executive Officer (1 Dec 2008 - 31 Mar 2009) 行政總裁（二零零八年十二月一日至二零零九年三月三十一日）	1,013,332
4 level one executives 四名一級員工	9,096,783
23 level two executives 二十三名二級員工	22,538,669

Annual Remuneration 1 Apr 2008 - 31 Mar 2009 (HK$) 全年薪酬 由二零零八年四月一日至二零零九年三月三十一日（港元）	Number of Senior Executives 高級行政人員數目
0 to 1,000,000	7
1,000,001 to 1,500,000	11
1,500,001 to 2,000,000	5
2,000,001 to 2,500,000	4
2,500,001 to 3,000,000	1

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

ASTRI's research work is mainly carried out by the following four major technology groups:

- Communications Technologies;
- Enterprise & Consumer Electronics;
- IC Design; and
- Material & Packaging Technologies.

These four groups also form the cornerstones of the Information and Communications Technologies R&D Centre (ICT RDC) initiated by the Innovation and Technology Commission (ITC) and housed at ASTRI to jointly pursue research topics for substantive industrial impact with research institutions, industry and academia in Hong Kong. In the coming years, most of ASTRI's research work will be conducted under the ICT RDC.

ICT R&D programmes are formulated not only to bring strategic "applications" that are transferable to industry enhancing their competitiveness, but also to build and strengthen "technical competencies" or "platform technologies" that continuously spawn a multitude of future applications.

The progress and development of ASTRI's four R&D groups and its subsidiary — The Hong Kong Jockey Club Institute of Chinese Medicine (HKJCICM) during the year under review are reported in the following pages.

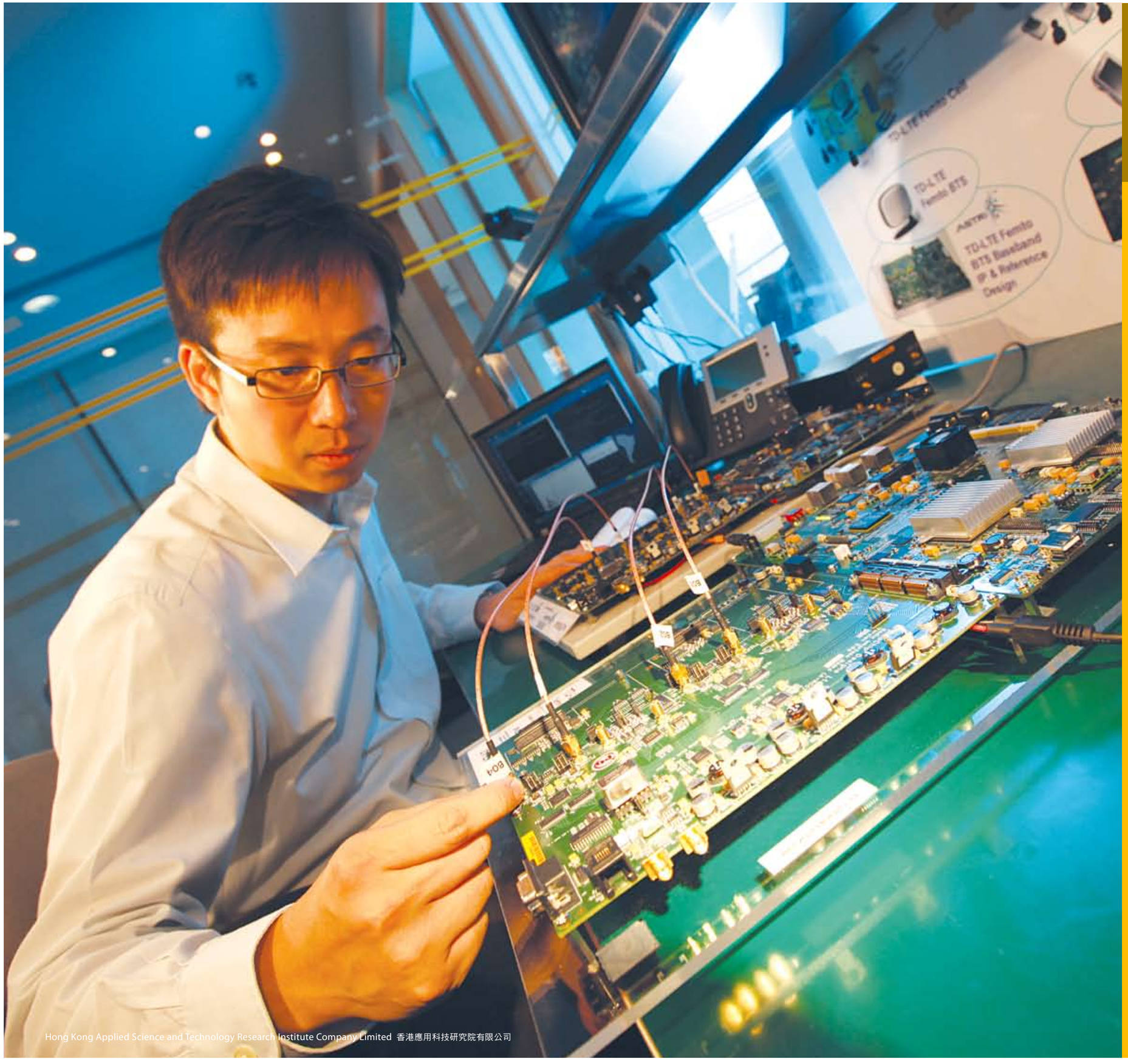
應科院的研究工作大部份由下列四個主要技術群組執行：

- 通訊技術；
- 企業與消費電子；
- 集成電路設計；及
- 材料與構裝技術。

此四個群組亦構成「香港資訊及通訊技術研發中心」的基石。該中心由創新科技署成立，應科院承辦，與本港研究機構、業界和學術界協力進行研究，創造實質的產業效益。未來數年間，應科院大部份研究工作將以香港資訊及通訊技術研發中心的名義進行。

中心的研發方向一方面強調策略性「應用」，務求將技術轉移予業界以促進其競爭力，另一方面不斷建立和加強「技術能力」或「平台科技」，持續地孕育多方面的應用，以應社會未來發展。

後頁是應科院四個研發群組及其附屬機構香港賽馬會中藥研究院的年度進展報告。



Communications Technologies Group
通訊技術群組

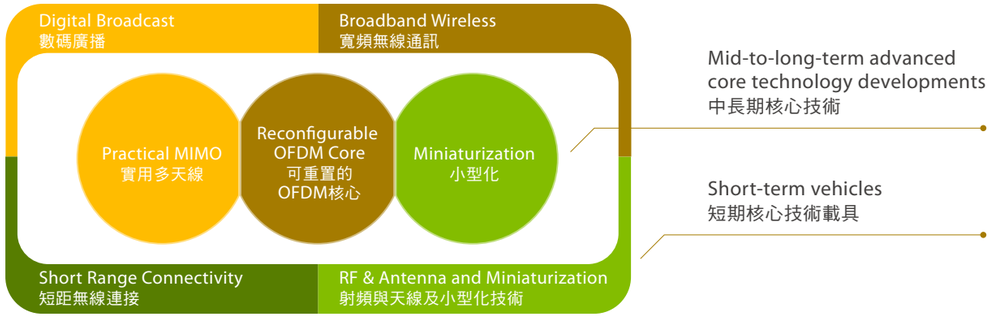
Review
回顧

Dr. I Chih-lin
易芝玲博士

Vice President and Group Director
Communications Technologies Group
副總裁及研發群組總監
通訊技術群組

Dr. I Chih-lin joined ASTRI in June 2005 and is responsible for the roadmap and technology R&D in the communications domain. Her team has planned and initiated four key technology initiatives for the Communications Technologies Group and these programmes target to develop world-class technologies that deliver differentiating industrial impacts, both for the long and near terms.

易芝玲博士於二零零五年六月加入應科院，負責通訊技術領域研發的規劃。她的團隊為通訊技術群組的整體技術研發建立了四個核心主軸，這些項目旨在發展可帶來短期及長遠獨特產業效益的世界級技術。



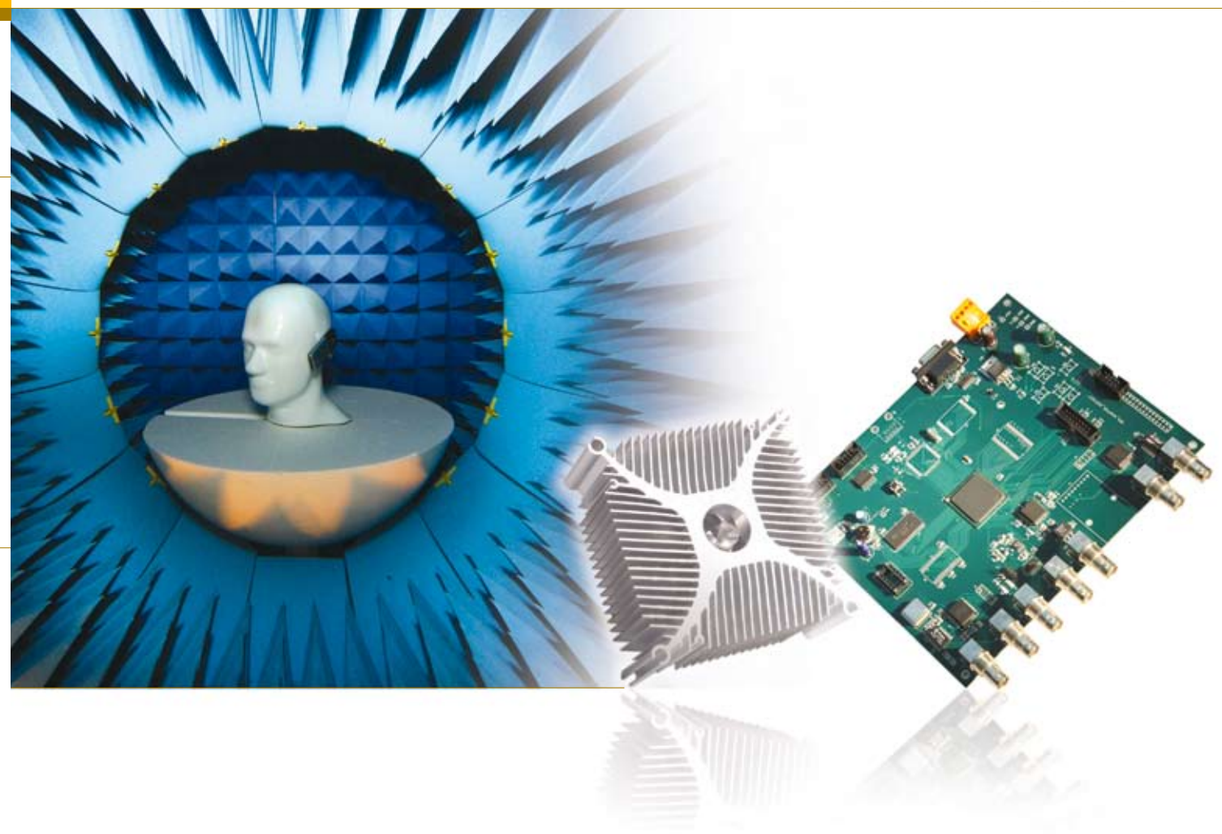
Major technology initiatives
主要技術發展領域

The Communications Technologies (CT) Group, established at the end of 2005, is themed WM7F (Wireless/Mobile Miniaturized Multi-Mode Multi-Media Multi-Function). It aims at addressing key trends and opportunities in wireless communications, such as high data rate high spectral efficiency transmission/reception for broadband wireless communications, ubiquitous radio access and small form-factors for both sustaining and disruptive innovations.

During the year under review, CT signed industry contribution agreements totalling $28.87 million ($22.14 million cash and $6.73 million in-kind) through more than 40 technology transfer contracts and in-kind contribution proofs – a significant increase compared to $8.49 million through more than 20 contracts and proofs in 2007/08. The total industry contributions signed in the past three years was HK$59.2 million through 71 contracts and proofs. This sound achievement in industry contributions demonstrates that CT technologies are in strong demand by industry.

通訊技術群組自二零零五年年底成立以來，一直以多制式多媒體多功能的無線移動通訊與微型化的發展主軸為基礎，力求在無線通訊持續性和突破性的創新發明兩方面，例如高速率高傳輸效率的寬頻無線通訊、無所不在的無線存取，以及微小化設計等，捕捉主要趨勢，為產業創造新機會。

在二零零八/零九財政年度，通訊技術群組與業界成功簽訂超過四十項技術轉移及物資資助合同，金額高達二千八百八十七萬元（包括二千二百一十四萬元現金和等值六百七十三萬元物資資助）。簽署總金額與合同數目相比上一財政年度的八百四十九萬元及超過二十份合同有大幅度增長。過去三個財政年度合計簽訂技術轉移及物資資助合同七十一項，業界投入資金高達五千九百二十萬元，充分顯示通訊技術群組開發的技術確為業界之所需。



On industry contributions, CT received around $16 million (more than $11 million cash and close to $5 million in-kind). It was 21 per cent of total ITF expenditure ($74.6 million) and close to 18 per cent of total project expenditure ($87.7 million). All the above figures show that CT has far exceeded the annual targets.

Having identified the three key directions of mid-to-long-term advanced core technology developments in Practical MIMO, Reconfigurable OFDM Core and Miniaturization, CT addressed market needs and selected vehicles for short-term industrial impacts and differentiations.

The four categories of vehicles picked to convey core technology development or respond to immediate demands are:

- Broadband Wireless: Mobile WiMAX and LTE with Practical MIMO core technology;
- Digital Broadcast: Multimode mobile TV and DTMB with Reconfigurable OFDM Core technology;
- Short Range Connectivity: CWPAN/Zigbee and UWB for vertical markets; and
- RF & Antenna and Miniaturization, which are indispensable in all wireless devices and equipment.

群組在年度內收到的業界投入資金總額為一千六百萬元（包括超過一千一百萬元現金和等值接近五百萬元的物資資助）。此金額分別佔創新及科技基金總支出（七千四百六十萬元）百份之二十一，及總支出（八千七百七十萬元）約百份之十八。這些數字顯示群組業績超越了年度所定目標。

群組著重發展的中長期核心技術有三方面，包括實用多天線、可重置的OFDM核心及小型化，以加強本地與內地產業的無線科技競爭能力。同時也考慮市場發展，慎選載具，以滿足近程的需求。

短期核心技術載具包括四方面：

- 寬頻無線通訊：選擇移動WiMAX及長期演進等載具以發展實用多天線核心技術；
- 數碼廣播：選擇多制式數碼移動電視及中國的數碼地面廣播制式DTMB等載具，以發展可重置的OFDM核心技術；
- 短距無線連接：支援內地與國際標準的多制式CWPAN/Zigbee及超寬帶；及
- 一切無線器件及儀器不可或缺的射頻與天線及小型化技術。

Hardware engineer testing DTMB demo system.
硬件工程師正在調試DTMB演示板。

CT also leverages core communications technologies and applies them in value-added applications such as medical equipment, eHealthcare and telemetry.

CT has achieved significant progress in technology innovation/dissemination, as well as in recruiting prominent leaders with extensive management track records from Hong Kong, the Mainland and United States. Most of the R&D leaders come from world-leading companies and thus bring in seasoned technologies and valuable experience.

On technical innovation, 17 patents, 16 by United States and one by the Mainland, have been granted to ASTRI owing to technologies developed by CT. They included three by the USPTO only within 18 months because of their high quality.

CT achieved much progress in mobile WiMAX, Customizable WMS, Practical MIMO and TD-LTE, DTMB, Multimode Mobile TV, Antenna & RF, RFIC, Material & Miniaturization, MRI and MRE, impacting industry substantially.

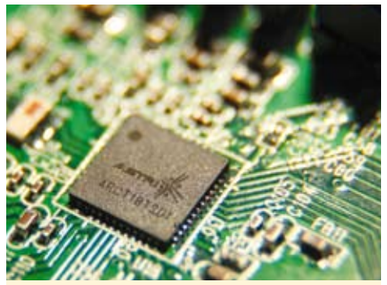
The technical breakthroughs and their applications enabled ASTRI and its licensees to receive three important awards: Best Life Style Bronze Award of Hong Kong ICT Award 2008; Best Innovation Award of Chinese National Information Technology Standardization (NITS) Award 2008; and Red Herring's Top 100 Asia Awards 2008.

此外，群組也將其開發的核心技術應用在具有高附加價值的各種產品與服務上，如醫療儀器、電子保健，以及遙測等。

通訊技術群組在專業人才招募、技術創新，以及技術轉移等各方面，都表現卓越。目前我們擁有來自香港、中國內地以及美國等地優秀的領導人才，許多負責研發的領導人員都曾經在國際一流公司服務，具備先進技術實務設計能力與管理經驗。

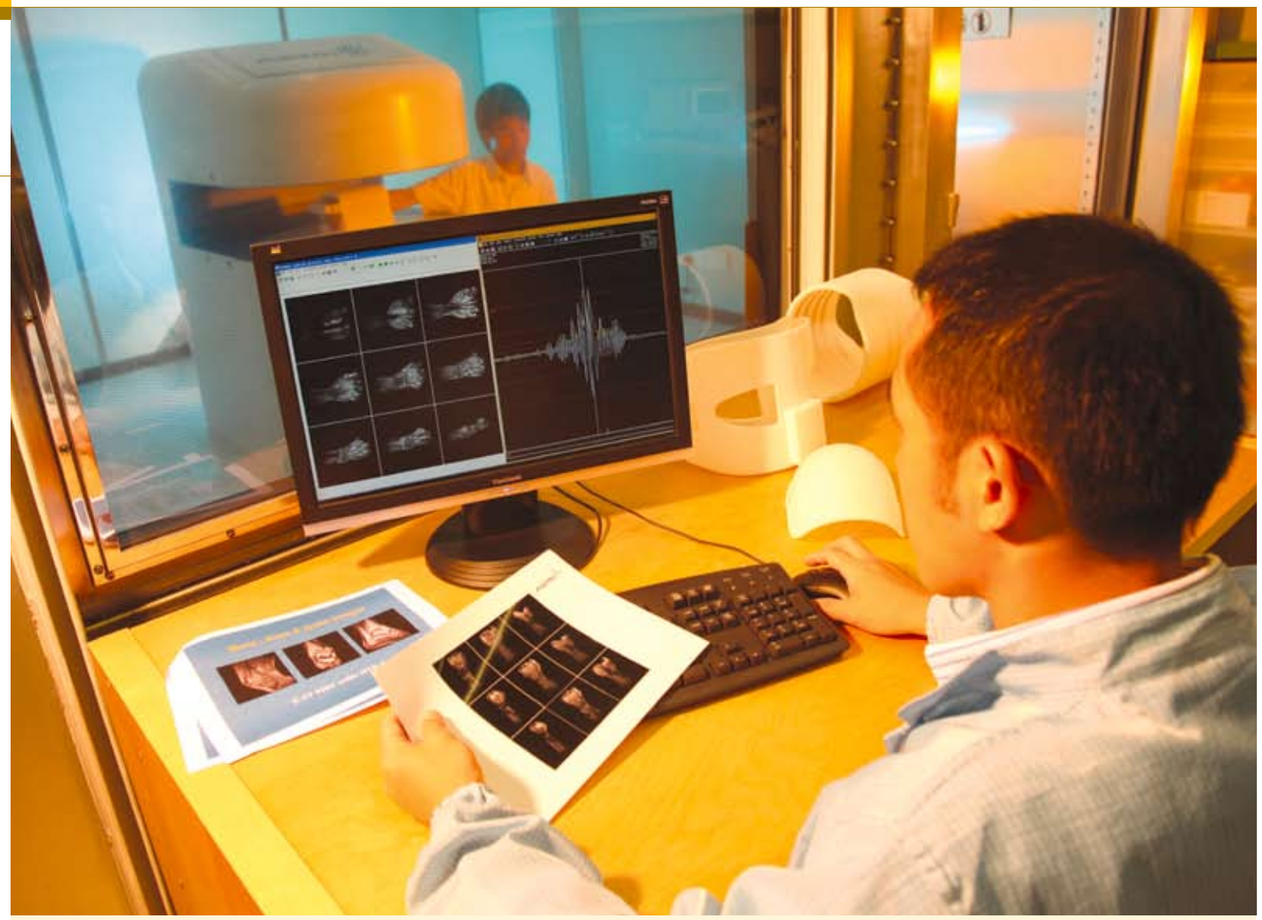
在技術創新方面，由通訊技術群組研發的技術共取得十七項專利，包括十六項在美國取得及一項在中國取得的專利。其中三項發明，由於水準極高，在提交專利申請後短短一年半內已獲得美國專利商標局頒發專利。

群組在許多技術發展上也取得長足的進步，例如移動WiMAX、可定制無線網絡管理系統、實用多天線及TD-LTE、DTMB、多制式移動電視、天線及射頻、射頻晶片、材料及小型化、磁共振成像及磁彈力成像等，為業界帶來很多有用的新技術。



CWPAN/Zigbee chip.
CWPAN/Zigbee晶片。

群組在技術創新與突破上的優異成績，令應科院與其特許授權公司在過去一年獲得三個重要獎項，包括二零零八年香港資訊及通訊科技獎最佳生活時尚獎銅獎、二零零八年中國信標委優秀開拓獎，以及二零零八年Red Herring亞洲頂尖一百大獎。



Testing of RF coil performance in magnetic resonance imaging machine.
在磁共振成像儀中進行射頻綫圈功能測試。

Collaboration has been an important CT development strategy. In addition to making active contributions to the advisory committees for Digital 21 Strategy, Hong Kong Science and Technology Parks, WTIA and universities, CT co-founded with these partners the Hong Kong WiMAX-DTV (renamed BWA-DTV to embrace LTE) Industry Consortium and the Hong Kong Digital Terrestial Television Local Testing Group (DTTG), benefiting local industry and ICT development in Hong Kong.

Besides active and close partnerships with local universities, CT established ASTRI-Tsinghua University Multimedia Broadcast and Communication (MBC) Joint Lab to serve local and the Mainland's digital TV industry. The Chinese Academy of Science, one of the largest R&D organisations on the Mainland, and CT are forming the "Advanced Wireless Technology Joint Research Centre" to develop LTE and IMT-Advanced wireless technologies. Furthermore, collaborations in TD-LTE with leading Mainland firms on China's Science and Technology Key Programme, and with leading international companies have promoted ASTRI and Hong Kong to Mainland and global wireless communication communities.

通訊技術群組的重要發展策略是與其他機構合作。故此，群組一直積極參與數碼21策略、香港科技園、香港無線科技商會及各大學的諮詢委員會工作，並且與這些合作夥伴共同創立香港WiMAX數碼電視產業聯盟（後更名為寬頻無線接入數碼電視產業聯盟，以包括LTE）和香港數碼地面電視廣播測試組織（DTTG），使本地業界和香港資訊通訊的發展受益。

除了與本地大學緊密合作，群組還成立了應科院–清華大學多媒體廣播與通訊聯合實驗室，協助香港和內地數碼電視產業的發展。群組又與國內最大的研發單位之一，中國科學院規劃成立「先進無線通訊聯合研發中心」，發展LTE技術和IMT-Advanced無綫技術。此外，在TD-LTE技術方面，與內地領先企業合作發展中國科技重大專項，以及與國際領先企業的技術合作，均有效提升應科院及香港在內地與全球無線通訊產業的地位。

Developments
發展

Broadband wireless, digital broadcast and short range connectivity are picked as the current main application vehicles to develop mid-to-long term core technologies: Reconfigurable OFDM, Practical MIMO and Miniaturization.

On broadband wireless, CT has successfully developed the Mobile WiMAX BTS Platform to support Wave 2 MIMO capability. This scalable single board design is cost-effective and customizable to suit various product configurations such as macro, micro, pico and femto. This initiative has led to multiple technology transfers to a Hong Kong-based leading telecom equipment company to establish their technical foundation of WiMAX system.

The Customizable WMS can be easily customized to manage various equipment in small to medium-sized WiFi and WiMAX networks. So far, it has been customized to support more than 20 models of base stations from 10 vendors, licensed to telecom equipment vendors and system integrators, and widely deployed in different locations such as schools, cargo terminals and airports in Hong Kong, the Mainland and overseas. Leveraging the customization technology, CT is developing the WiMAX ASN-GW to support multi-model/vendor base stations. It has passed interoperability tests conducted by III in Taiwan.

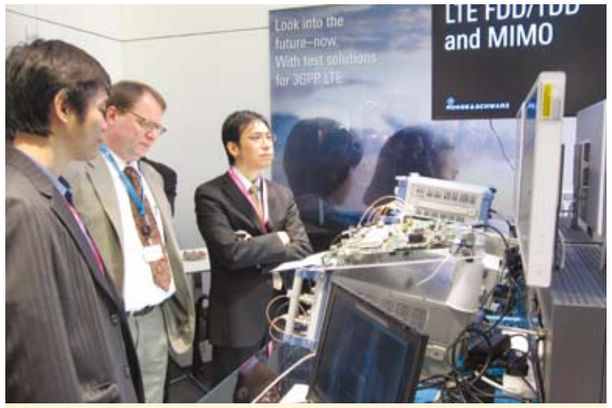
寬頻無線接入、數碼廣播和近程連接被選為開發中期至長期核心技術如可重置的OFDM核心、實用多天線及小型化技術的主要應用載具。

在寬頻無線接入領域，群組成功開發了移動WiMAX基站平台，支援Wave 2 MIMO技術能力。它合乎經濟效益，可以很容易地調整成為各種基站容量和性能的配置（macro、micro、pico及femto）。該技術已經轉讓給香港一家領先的無線通訊設備廠商，用來建立WiMAX系統技術基礎。

群組開發的可定制無線網絡管理系統適用於中小型WiFi和WiMAX的網路設備管理系統。目前該系統已透過客制化來支援來自十個不同廠商的二十多種型號的WiFi和WiMAX基站設備。該系統也被授權予系統集成和電訊設備供應商，並廣泛部署應用於香港、內地及海外的學校、貨運站及機場。借助客制化技術，通訊技術群組正在發展WiMAX接入網網關支援多模式/廠商基站。該接入網網關已在台灣資策會成功通過互操作性測試（IOT）。

群組開發的TD-LTE技術已被公認為全球領先技術。在二零零九年世界移動通訊大會上，群組與四家國際領先企業：picoChip（英國），Innofidei（中國），安捷倫（美國）和羅德與施瓦茨（德國）公司聯合展示了世界上第一個高清視頻流傳輸，利用TD-LTE的MIMO技術連接四個展位，同時同步進行視頻直播。

此外，通訊技術群組還獲邀與幾家中國內地頂級公司/組織，包括大唐（最大的電訊設備公司之一）、Innofidei（業界領先的無線集成電路公司）、中移動（最大的無線運營商）及中科院（最大的研發組織）共同申請中國中央政府的科學和技術重大專項的三個關於TD-LTE基帶晶片研發項目。基於其技術領先優勢，群組又獲中國移動邀請加入其TD-LTE的現場試驗。這些進展能有效地提升應科院以至香港在內地及全球無線行業的認受性。



ASTRI's TD-LTE demonstration at 2009 Mobile World Congress.
應科院在二零零九年世界移動通訊大會上作TD-LTE演示。

At the 2009 Mobile World Congress, CT was joined by four world leading companies, namely picoChip (United Kingdom), Innofidei (China), Agilent (United States) and Rhode & Schwarz (Germany), to stage a display of the world's first HD video streaming transmission and simultaneous live videos using TD-LTE with MIMO, demonstrating its globally leading competence in TD-LTE technology.

CT was also invited by several top Mainland organisations — Datang (one of the largest telecom equipment companies), Innofidei (a leading wireless IC company), China Mobile (the largest wireless operator) and CAS (the largest R&D organisation) to be co-applicant in three projects on TD-LTE baseband chip development in China Central Government's Science and Technology Key Programme. Owing to its technical leadership, CT is invited by China Mobile to join its TD-LTE field trial. The above developments effectively promoted not only ASTRI but also Hong Kong to the global and Mainland wireless industry communities.

On digital broadcast, the ASTRI-Tsinghua University MBC Joint Lab facilitated development and enhancement of DTMB (Chinese compulsory terrestrial digital TV standard) in Hong Kong and the Mainland when the industrial value chain was immature. Offering DTMB technologies to leading test equipment companies in Hong Kong and the Mainland and providing technical consultations to broadcasters and government agencies contributed to the success of DTMB deployment in Hong Kong and the Mainland. Currently, the DTMB market is taking off on the Mainland and expanding to the rest of the world., The MBC Joint Lab will continue to be a key leader and contributor in this field.

CT's focus in the field of mobile TV is to provide core chip designs for multimode devices, especially CMMB (Mainland), DVB-H (Europe), and T-DMB (Korea, Europe). The multimode baseband chip, using in-house reconfigurable OFDM Core, requires only a small increase, approximately 10 per cent, in size and power consumption when compared to a single mode chip. A multimode mobile TV RFIC tuner has been developed and licensed to a top semiconductor company on the Mainland.

On short range connectivity, the world's first dualmode CWPAN/Zigbee RFIC Transceiver and SoC, supporting both Mainland and international standards, have been developed and transferred to industry. This establishes a record in wireless IC industry on the Mainland. CT expanded into near-field technology and MRI applications. CT's near-field antenna arrays reduce the size, decrease the scanning time, increase the scanning resolution, and lower the MRI cost to 20 per cent. Besides, an ICP was formed with a local medical equipment company to develop an operational MRI machine.

On value-added applications, the feasibility of using piezoelectric driver array for better MRE imaging was investigated and a NFC anti-counterfeiting platform has been established.

SFN adapter used for DTMB system.
用於DTMB系統中的單頻網調試器。

在數碼廣播方面，應科院–清華大學多媒體廣播與通訊聯合實驗室的成立，促進了DTMB（中國數碼地面多媒體廣播標準/技術）在香港和內地的發展，縱使產業價值鏈還未成熟。群組為香港及內地領先的測試設備供應商提供DTMB技術，以及為廣播公司和政府機構提供技術諮詢服務。上述幾點都有助於DTMB在香港及內地的成功推行和發展。目前DTMB在中國內地正處於起飛階段，並且續步擴展到全世界。聯合實驗室將繼續在這一領域扮演領導角色，為產業作出貢獻。

在移動電視方面，群組提供多制式基帶核心技術，支援三個不同區域的標準：CMMB（內地）、DVB-H（歐洲）及T-DMB（韓國和歐洲）。與一個單一模式的晶片比較，由自行開發的可重置OFDM核驅動晶片，可以在體積和功耗輕度增加約百份之十的程度下完成。群組開發的多模移動電視射頻調諧器已授權予內地一家頂尖半導體生產商。

在近距離無線連接方面，通訊技術群組成功研發出世界首個可同時支援內地和國際制式的雙模CWPAN/Zigbee射頻收發器，並將技術向業界轉移，為內地無線晶片產業開創了新一頁。天線設計及射頻技術已擴展到近場技術及磁共振成像方面的應用。通訊技術群組的近場天線陣列能縮小儀器尺寸、減少掃描時間、提高掃描解析度，並降低MRI至成本的百份之二十。此外，群組與本地一家醫療設備公司建立了一個「業界合作項目」，以開發外科用的磁共振成像儀。

在高增值應用方面，應科院對使用陣列壓電驅動器以取得更好的磁彈力成像進行了可行性研發，並且開發了近場通訊技術的基礎防偽平台。

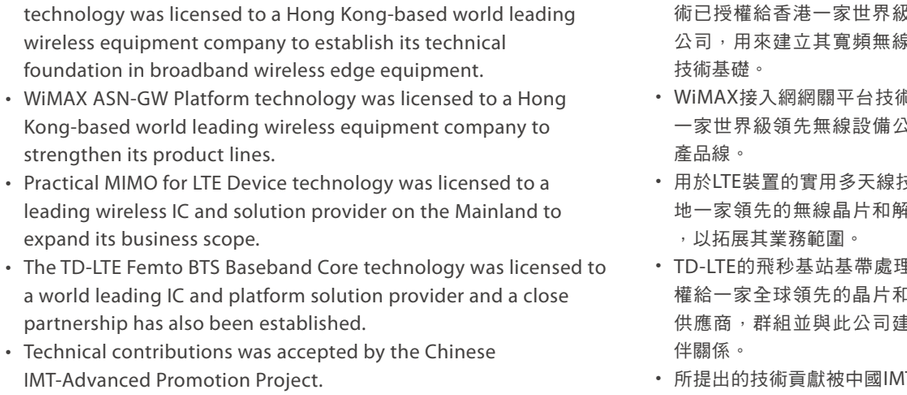
Achievements
成果

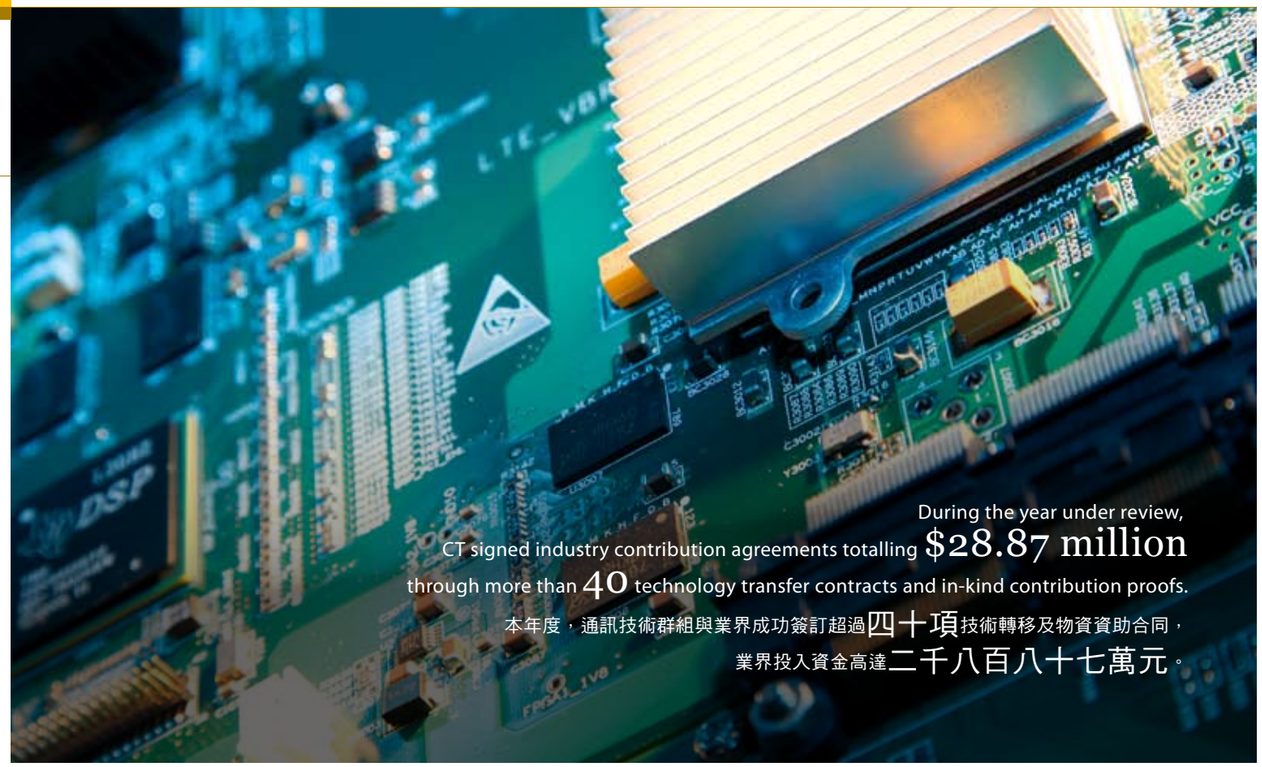
During the year, CT conducted many industry transfers. The following is a list of examples.

- On broadband wireless, the Mobile WiMAX base station platform technology was licensed to a Hong Kong-based world leading wireless equipment company to establish its technical foundation in broadband wireless edge equipment.
- WiMAX ASN-GW Platform technology was licensed to a Hong Kong-based world leading wireless equipment company to strengthen its product lines.
- Practical MIMO for LTE Device technology was licensed to a leading wireless IC and solution provider on the Mainland to expand its business scope.
- The TD-LTE Femto BTS Baseband Core technology was licensed to a world leading IC and platform solution provider and a close partnership has also been established.
- Technical contributions was accepted by the Chinese IMT-Advanced Promotion Project.
- Practical MIMO for WiFi technology was adopted in a joint project with a telecom company in Shenzhen in the SZ-HK Innovation Circle programme.
- On digital broadcast, the MBC Joint Lab has been effectively supporting DTMB deployment in Hong Kong. The Joint Lab transferred DTMB receiver testing software & environment to a world-leading test equipment company, and installed it in Hong Kong Science and Technology Park's Wireless Communication Test Laboratory to deliver DTMB receiver testing service to local industry. The Lab also transferred DTMB transmission technology to two broadcast equipment companies, one in Hong Kong and another on the Mainland, to expand respective product lines.
- The Reconfigurable Multimode Digital TV RFIC Tuner technology was licensed to a top semiconductor company on the Mainland to expand its business scope.

過去一年，通訊技術群組把許多研發成功的技術轉移給產業，下列為其中一些例子。

- 在寬頻無線方面，移動WiMAX基站平台技術已授權給香港一家世界級領先無線設備公司，用來建立其寬頻無線接入網設備的技術基礎。
- WiMAX接入網網關平台技術已授權給香港一家世界級領先無線設備公司，以加強其產品線。
- 用於LTE裝置的實用多天線技術已授權予內地一家領先的無線晶片和解決方案供應商，以拓展其業務範圍。
- TD-LTE的飛秒基站基帶處理核心技術已授權給一家全球領先的晶片和平台解決方案供應商，群組並與此公司建立了密切的夥伴關係。
- 所提出的技術貢獻被中國IMT-Advanced推廣項目採納。
- 用於WiFi技術的實用多天線技術，已被深港創新圈項目下一間深圳電訊公司負責的聯合項目所採納。
- 在數碼廣播方面，應科院–清華大學多媒體廣播與通訊聯合實驗室在本港有效地推行了DTMB中國數碼地面電視廣播標準。聯合實驗室將DTMB接收機測試技術和軟體解決方案授權給一家全球領先的測試設備供應商，並在香港科技園的無線通訊測試中心為本地業界安裝及提供DTMB接收機測試服務。聯合實驗室還將DTMB傳輸技術轉移給兩間分別在香港和內地的電訊設備公司，以擴大他們的產品線。
- 可重置多模數碼電視射頻調諧器技術，已授權給內地一家頂級半導體公司，以拓展其業務範圍。





- On short range connectivity, Dualmode CWPAN/Zigbee RFIC transceiver technology was licensed to a CWPAN leading company on the Mainland. The world's first Dualmode CWPAN/Zigbee RFIC transceiver was successfully delivered and the SoC will be completed shortly.
- The UWB technology is being applied to provide contract service to a standard organisation for new application development.
- On miniaturization technology, Antenna Centre of Excellence has offered more than 20 high performance and cost-effective antenna designs of single/multimode mobile devices (cellular, mobile TV, WiFi/WiMAX, UWB) to Hong Kong and Mainland companies.
- RF Jamming for road toll was developed and transferred to avoid mischarging.
- Thermal management technology was licensed to two LED companies for mass-production of high power LED lamps and instalment on the Mainland. One LED lamp has been displayed in Hong Kong Science Park for more than six months. A larger scale demonstration is under planning.
- The high-density data storage technology was licensed to two Hong Kong-based companies and an ICP has been established to conduct further joint R&D.
- Near Field Antenna Sub-assembly technology was licensed to a Hong Kong-based medical equipment provider and an ICP has been established to jointly develop the advanced and affordable MRI machine.

- 在短距離無線連接方面，雙模式CWPAN/Zigbee的射頻收發器技術，已授權給國內一家領先的CWPAN公司。世界第一個CWPAN/Zigbee雙模射頻收發器已成功交付，其系統晶片將於短期內完成。
- UWB技術被標準制定組織採納，來提供合同式服務。
- 在微型化技術方面，通訊技術群組在其領先業界的天線研發中心內，向香港和內地企業提供了二十多個高性能和具成本效益的單/多模移動終端（手機、移動電視、WiFi/WiMax、UWB）天線設計。
- 成功開發道路自動收費系統射頻通道技術並轉移給業界以避免錯誤收費。
- 散熱管理技術已授權給兩家LED公司，用作在內地大量生產和安裝高功率LED照明燈。群組曾經在香港科學園展出一支LED燈超過半年，日後將會安排更大規模的產品展示。
- 高密度數據存儲技術已授權給兩家香港公司，並已建立「業界合作項目」，以便進一步合作研發該技術。
- 近場天線子裝配技術已授權給香港一家醫療設備供應商，雙方並建立了一個「業界合作項目」，共同開發先進和經濟型的磁共振成像儀。

Project Highlights
重點研發項目

★ Industry Collaborative Project 業界合作項目 ● Full Project 正式項目 ● Seed Project 種子項目

	Project 項目	Description 內容	Date 日期
● 1	Mobile WiMAX Base Station Technology Platform 移動WiMAX基站技術平台	This project develops a mobile WiMAX BTS platform compliant with IEEE 802.16e standard for commercial applications. This cost-effective single board solution supports mobile WiMAX Wave 2 MIMO and features a scalable design. 本項目開發符合IEEE 802.16e標準的商用移動WiMAX基站平台。支援實現WiMAX Wave 2 MIMO技術能力的單板解決方案，具成本效益及可伸縮設計。	Jun 2008 ~ Nov 2009 二零零八年六月至二零零九年十一月
● 2	Access Service Network Gateway (ASN-GW) Platform 接入網網關平台	This project evaluates various options and methodologies to develop the ASN-GW platform in the coming full project. Three main areas are identified: (1) hardware platform and OS; (2) software architecture design; and (3) multi-vendor/model rapid customization. 本項目對開發ASN-GW平台的各種方案和方法進行評估，為未來正式項目作準備。三個主要研究領域包括(1)硬體平台和操作系統；(2)軟件架構設計；(3)多廠商/模式快速定制。	Feb ~ Jul 2008 二零零八年二月至七月
● 3	WiMAX Access Service Network Gateway (ASN-GW) Platform 接入網網關平台	This project develops WiMAX ASN-Gateway, including basic data, control and management modules to coordinate the mobility handover, data path, paging, QoS authorization, and user authentications among WiMAX base stations. The developed ASN-GW platform has two unique characteristics: Rapid Customization to support multi-vendor/model BTSs and Hybrid Radio Resource Control (RRC) architecture for enhancing RRC performance. 本項目開發WiMAX接入網網關，包括基本數據，負責控制和協調移動交接的管理模塊、數據路徑、傳呼、QoS的授權和WiMAX基站間的用戶認證。先進的接入網網關平台有兩個特點：(1)快速客制化，支援多廠商/模式基站和(2)混合無線資源控制(RRC)架構以加強區域參考中心的性能。	Jul 2008 ~ Jan 2010 二零零八年七月至二零一零年一月
● 4	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實驗室基礎平台技術	This project develops a strategic technology platform, including (1) DTMB receiver test and verification specification, methodology, software and environment; (2) DTMB transmit spatial diversity scheme, a system equipped with spatial diversity capability will be designed and implemented and (3) BWM spectrum management and deployment strategy. 本項目開發聯合實驗室的戰略技術平台，主要關注以下幾方面的技術：(1)產品認證：發展相關標準和認證方法、軟件及環境；(2)空間分集：開發創新的發射端空間分集技術，建立具有空間分集設計的實驗系統；(3)研究中國寬頻無線多媒體(BWM)網路的部署方法及頻譜資源管理。	Jan 2008 ~ Dec 2010 二零零八年一月至二零一零年十二月
● 5	ASTRI-Tsinghua University MBC Joint Lab -- DTMB Instrumentation and Testing Platform 應科院－清華大學多媒體廣播與通訊聯合實驗室DTMB測試技術	This project designs and develops DTMB measurement and analysis tools necessary for building test equipment, software tools for measuring and displaying DTMB signals in field, post processing and analysis software package. 本項目設計和開發供建立測試設備所用的DTMB測量分析工具。其中包括測量及演示DTMB訊號的軟件工具；數碼電視訊號場地測試採集系統；後處理分析軟件包。	Jun 2008 ~ May 2009 二零零八年六月至二零零九年五月
● 6	ASTRI-Tsinghua University MBC Joint Lab -- DTMB SFN Technology Adaptors and Systems 應科院－清華大學多媒體廣播與通訊聯合實驗室DTMB單頻網技術	This project designs and builds a prototype adaptor required for DTMB SFN synchronization. The core technologies include synchronization signal generation and transmitter synchronization. SFN deployment methodology for DTMB network has been developed. 本項目設計和開發為單頻網同步所用的適配器模型，核心技術包含訊號產生以及發射機同步。用於DTMB網路的單頻網調度演算法也將被開發。	Jan 2008 ~ Jan 2009 二零零八年一月至二零零九年一月
● 7	OFDM Core for Digital TV Applications OFDM核數碼電視應用	This project develops a DTMB receiver baseband chip design, including architecture, algorithms, functional blocks, test bench, hardware realization, test chip, etc. Such development establishes the core technology foundation, which leads to chip development. 本項目開發DTMB接收器基帶晶片，包括系統架構、演算法、功能模組、測試平台、硬體實現和測試晶片等。目的是建立核心技術基礎，從而開發晶片。	Oct 2007 ~ Apr 2009 二零零七年十月至二零零九年四月

	Project 項目	Description 內容	Date 日期
8	T-DMB Digital TV/Audio Baseband Demodulator	As the starting point of establishing the reconfigurable OFDM core for multimode mobile TV device, this project explores the architecture and realization methods for a T-DMB baseband demodulator. More importantly, the project explores the reusable building blocks, control mechanisms for the design of a low power, low silicon area and cost-effective reconfigurable multimode mobile TV baseband demodulator.	Nov 2007 ~ Apr 2008
	T-DMB數碼電視/音訊基帶解調器	目標是實現一個低功耗、小矽面積及價格低廉的T-DMB基帶解調器設計。另外，出於可重複配置方面的考慮，本項目將研發出在實現多模數碼廣播標準時能被重用的模組。	二零零七年十一月至二零零八年四月
9	DVB-H Core for Multimode Mobile TV	As the starting point of establishing the reconfigurable OFDM core for multimode mobile TV device, this project explores the architecture and realization methods for a DVB-H baseband demodulator. More importantly, the project explores the reusable building blocks, control mechanisms for the design of a low power, low silicon area and cost-effective re-configurable multimode mobile TV baseband demodulator.	Nov 2007 ~ Apr 2008
	多模移動電視DVB-H核心技術	目標是實現一個低功耗、小矽面積及價格低廉的DVB-H基帶解調器設計。另外，出於可重複配置方面的考慮，本項目將研發出在實現多模數碼廣播標準時能被重用的模組。	二零零七年十一月至二零零八年四月
10	Multimode Mobile TV Baseband Demodulator	This project develops a multimode mobile TV baseband demodulator supporting CMMB (Mainland), DVB-H (Korea, Europe) and T-DMB (Europe). It fully utilizes the common building blocks of the three OFDM-based standards/technologies to deliver a low power, low silicon area and cost-effective solution for multimode mobile TV devices and applications.	Jul 2008 ~ Jan 2010
	多模式移動電視基帶解調器	本項目開發適用於多模式移動電視的基帶解調器晶片技術和積體電路解決方案，支援CMMB（中國）、DVB-H（韓國、歐洲）及T-DMB（歐洲）等多項標準。並且充分利用這些均以OFDM為基礎的標準／技術中的可共用模塊的特性，來發展低功耗、小面積及價格低廉的多模式移動電視解決方案與應用。	二零零八年七月至二零一零年一月
11	Advanced Indoor MIMO Platform	This project develops core technologies of Practical MIMO design, incorporating baseband, RF chain and antenna, and integrating them into a terminal device, e.g. PDA and sub notebook. The IEEE 802.11g/n indoor platform is used as the baseline system to evaluate the performance, and the enhanced 802.11g/n platform is applied to a high-end home AV distribution system to demonstrate the significance of the innovations. Reference designs and core IP modules are the main deliverables of the project.	Dec 2006 ~ May 2008
	先進室內多輸入多輸出平台	本項目開發能夠在小型化手持終端上，如個人數碼助理和手提電腦，實現多輸入多輸出系統的核心技術，包括數碼基帶訊號處理、射頻鏈路及天線設計。以基於IEEE 802.11g/n標準的系統為基本平台，開發和實現相應的核心技術，並以此為基礎搭建了一個家庭無線音視頻分配系統，展示相應技術的優越性。	二零零六年十二月至二零零八年五月
12	Practical MIMO for WiMAX/LTE Device	On top of the technologies built for Practical MIMO for indoor WiFi terminal device, this project focuses on the design and implementation of Practical MIMO and baseband core technologies for 3GPP TD-LTE terminal device, which is at an early stage globally and on which ASTRI has great opportunities to play important roles.	Jun 2008 ~ Dec 2009
	WiMAX/LTE裝置上的實用多輸入多輸出技術	基於室內多天線無線終端設備實用多天線技術，這個項目的重點是設計和實施用於3GPP的TD - LTE的終端設備的實用MIMO和基帶核心技術。該技術在全球仍處於早期階段，應科院有很大機會發揮其主導角色。	二零零八年六月至二零零九年十二月
13	Wireless PAN and Streaming Media Access Control	This project develops a MAC (Medium Access Control) design solution that is compatible with UWB related standards (WiMedia, IGRS and DLNA). The solution supports both WPAN (Wireless Personal Area Networking) stand-alone systems and embedded modules for high speed wireless multimedia consumer devices and products.	Nov 2006 ~ Apr 2008
	無線個域網及無線流媒體接入控制	本項目開發與WiMedia、IGRS、DLNA等相關標準及介面相容的MAC設計方案。最終的設計方案將為無線個域網中獨立系統以及嵌入式應用提供平台，並支援本地電子製造商創造新的高速無線多媒體消費電子產品。	二零零六年十一月至二零零八年四月

	Project 項目	Description 內容	Date 日期
14	RF Design for WPAN Core Technology Platform 基於無線個域網核心技術平台的超寬頻射頻設計	This project develops WiMedia MB-OFDM based UWB RFIC design, IP and solutions. Research efforts focus on the creation of reusable architecture, hardware IP blocks, test software and product development kits. 本項目基於WiMedia MB-OFDM無線超寬頻標準，同時考慮中國未來的UWB規範，開發先進的射頻積體電路設計、智識產權和解決方案。主要是設計可複用的系統結構、硬體IP塊、測試軟體以及產品開發包等。	Nov 2007 ~ May 2009 二零零七年十一月至二零零九年五月
15	Next Generation Antenna Sub-assemblies 新一代天線組裝配件	This project develops a new intelligent antenna sub-assemblies platform technology, which can be applied across: (1) Multi-band/mode and Miniature antenna sub-assemblies for future wireless devices; (2) Beam-forming antenna sub-assemblies at low cost while increasing the system's range; and (3) MIMO antenna sub-assemblies for high data rate applications. 本項目研究開發新型的天線整合組裝設計技術平台。該技術平台應用於(1)無源天線與周邊元器件整合的設計技術；(2)波束天線整合組裝設計，具備低成本、增加系統傳輸距離等優點；(3)多天線整合組裝設計技術及其在高數據率中的應用。	Feb 2008 ~ Jul 2009 二零零八年二月至二零零九年七月
16	Advanced & Affordable MRI 先進及經濟的磁共振成像系統	Making use of ASTRI's RF, antenna, array and signal processing technologies, the project constructs a prototype of 0.3T affordable low-field MRI system. Specific antenna coil arrays for different parts of the body including wrist, hip, shoulder, head, ankle, knee, foot and hands for greater resolution are being developed. Meanwhile, the project is also setting up the High-Temperature Super-conducting equipment (HTS) for advanced image resolution. With the addition of the HTS and advanced antenna coil design, ASTRI's affordable low-field MRI system will have equivalent resolution to the much more expensive high-field MRI system. 利用應科院對射頻、天線、陣列和訊號處理專有的技術知識，此項目構建了一個經濟型0.3T低場MRI系統的原型。研究著力對身體不同部份，包括腕關節、髖部、肩部、頭部、踝關節、膝蓋、手和腳的感測器，進行工業設計和增強天線線圈陣列的解析度。本項目還同時為先進圖像解析度設立高溫超導電設備。加上高溫超導和先進的天線線圈設計，應科院開發的經濟型低場強磁共振成像系統的圖像解析度可媲美昂貴高場強磁共振成像系統。	Nov 2008 ~ Apr 2010 二零零八年十一月至二零一零年四月

	Project 項目	Description 內容	Date 日期
17	Near-field Antenna Sub-assemblies 近場天線組裝配件	This project develops low-cost, high-performance antenna coil arrays and multi-band antenna coils, as well as beam-forming and isolation technologies for high value-added applications. One of the key applications is medical imaging, particularly in providing high resolution MRI machine with low cost. 本項目開發低成本、高性能、高附加值應用的天線線圈陣列和多波段天線線圈，以及波束和隔離技術。其中一個主要應用是醫學成像，特別是經濟而且圖像解析度高的磁共振成像儀。	Sep 2008 ~ Mar 2010 二零零八年九月至二零一零年三月
18	Dualmode CWPAN/Zigbee RFIC Transceiver CWPAN/Zigbee雙模射頻收發器晶片	This project develops dualmode RFIC transceiver to support low-rate Chinese WPAN standard at 780 MHz and international Zigbee standard at 868/915 MHz. The development includes module design (LNA, PA, mixer, VCO, PLL, VGA and ADC/DAC) and transceiver integration. The transceiver adopts direct conversion architecture to save power and reduce size with advanced DC offset cancellation techniques. The 0.18µm RF CMOS technology is used to implement the transceiver. 本項目開發雙模射頻收發器晶片，支援低速率780MHz的中國無線個域網(CWPAN)標準和868/915MHz的國際Zigbee標準。項目重點包含多個獨立模組的設計和整個收發器的集成。主要模組包括LNA、PA、mixer、VCO、PLL、VGA及ADC/DAC。射頻收發器採用零中頻的架構以節省功耗和面積，並採用了先進的直流偏移取消技術。製造工藝採用0.18µm RF CMOS。	Jan 2008 ~ May 2009 二零零八年一月至二零零九年五月
19	Reconfigurable Multimode Digital TV RF Tuner 多模數碼電視射頻調諧器	This project develops multimode RFIC tuner to support CMMB, DVB-H, DMB-H and T-DMB standards for mobile applications. ASTRI is one of the leading companies developing tuner for China mobile TV standard CMMB. This tuner covers three bands: VHF, UHF and S-band. Advanced direct conversion architecture is adopted to save power and reduce size. I2C is used as serial interface with baseband. Dedicated gain control and time-slicing control are included. The tuner is fabricated in 0.13µm RF CMOS technology. 本項目開發多模數碼電視射頻調諧器，可支援CMMB、DVB-H、DMB-H和T-DMB等四個標準。應科院是開發中國移動電視標準CMMB的領先廠商之一。該調諧器覆蓋VHF、UHF和S波段三個頻段。採用零中頻直接轉換架構來節省功耗和縮小尺寸。該射頻調諧器採用0.13µm RF CMOS製程技術製造。與基帶之間的串行接口為I2C，增益控制及時隙控制也包含其中。	Mar 2009 ~ Sep 2010 二零零九年三月至二零一零年九月

	Project 項目	Description 內容	Date 日期
20	Thermal Energy Management with Advanced Materials and Structures (TEMA) 先進材料和結構的散熱管理	This project using advanced structural design and integration with material technology is to develop and implement an excellent heat dissipation module for commercial products, which critically need high performance dissipation module, such as wireless base station, lighting and CPU. 本項目利用先進的結構設計並與材料技術結合，來開發和實現一個優異的散熱模組，提供給需要高效散熱模組的商品使用，例如無線基站、照明產品及中央處理器。	Dec 2007 ~ Aug 2009 二零零七年十二月至二零零九年八月
21	Recordable Electrical Memory (REME) 可錄式電子記憶器	This project designs and implements CMOS and TFT gated program storage device with the characteristics of high resistance contrast, multiple stable recording states, good data retention, easy fabrication and ultra low cost (using depreciated equipment). 本項目設計及開發NOR-type CMOS及TFT gated的高密度可錄式程式記憶元件。它具有可以達到多重、可區別、可重複、及穩定的記憶狀態等特性，同時具備易生產和低成本等優點。	Nov 2008 ~ Oct 2010 二零零八年十一月至二零一零年十月
22	Next Generation Anode Material for Lithium Ion Batteries (NALI) 新一代鋰電池陽極材料	This project develops low-cost anode material which meets the high energy capacity range (350~450mAmphr/g), and high C-rate with long cycle-life for the next-generation Li-ion-battery. The nano-structure anode-material (patent pending) can enter the market easily and fulfil the requirement of industrial packaging process for batteries. 本項目研發低成本負極材料，符合新世代鋰電池所需高電容量密度需求（350~450mAmphr/g），並具有安全與長壽命之快速充放電效果。此新研發之納米結構負極材料（專利申請中）相容於鋰電池組裝制程與所需工業規格，為一種非常容易進入現今高附加價值儲能市場之負極材料。	Nov 2008 ~ Oct 2010 二零零八年十一月至二零一零年十月
23	NFC Anti-Counterfeiting Wireless Platform 近場通訊防偽無線平台	This project integrates various in-house technologies to create an NFC anti-counterfeiting prototype platform including Antenna, NFC Tag, NFC Reader, Firmware, Customizable Network Management and Application Software. This platform can be adapted to prevent sale of counterfeit goods, e.g. baby formula, drugs and foods. 本項目整合通訊技術群組的各種技術，來創造一個NFC防偽造原型平台，包括：天線、NFC標籤、NFC閱讀器、固件、網絡管理、應用層及機械工業設計。該示範平台能夠加以調整而應用於如嬰兒用品、藥物和食品等，以提防假冒。	Apr ~ Oct 2008 二零零八年四月至十月
24	Feasibility of Piezoelectric MRE Driver Array 用壓電驅動器陣列的磁共振彈性成像之可行性研究	This project explores the feasibility of developing a new piezoelectric driver array featuring light weight, small size and user-friendliness to facilitate early detection of diseases in brain, liver and other portions of the body. It leverages many core CT technologies such as signal process, antenna array, near-field electromagnetic, materials, transmitter and receiver designs. 本項目探索發展一個新的壓電陶瓷磁共振彈力成像驅動器系統的可行性，它具有重量輕、體積小、易於使用等特性，可用於及早發現腦、肝和其他人體內的疾病。研發過程大量借助群組的通訊核心技術，例如訊號處理、天線陣列、近場通訊、材料、訊號傳輸與接收等。	Feb ~ Aug 2008 二零零八年二月至八月
25	Thermal Therapy Apparatus & Devices (TTAD) for Surgical Applications 外科手術用熱療儀器設備	This project designs and develops economical, practical and high performance thermal therapy apparatus and devices (TTAD) to maintain patients' core body temperature at 36±0.5ºC range in surgical rooms. They are essential to prevent surgical wound infections caused by low temperature. 本項目研發經濟實用和高性能的外科手術熱療儀器，以有效維持人體體溫在36±0.5ºC範圍內，防止外科手術因低溫而導致傷口感染。	Sep 2008 ~ Dec 2009 二零零八年九月至二零零九年十二月
26	Feasibility Study of Amblyopia Treatment System (ATS): Training Equipment and Procedure 弱視治療系統：訓練儀器及程式的可行性研究	This project develops a high fidelity visual display system for effective Amblyopia (Lazy Eyes) training procedures at home or elsewhere. High resolution monochromatic video system and LCD goggle display are designed. Bluetooth or wired interfaces are provided to upload training programmes onto ATS. Test results can be transferred to computer for analysis. 本項目開發高傳真的視訊系統，並與訓練程式整合，供弱視患者在家中或其他場所進行矯正訓練。視訊系統為高傳真的單色顯示螢幕或護目鏡，可透過藍芽或有線界面上傳訓練程式，測試結果也能回傳電腦以進行分析。	Feb ~ Aug 2009 二零零九年二月至八月

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

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

Review
回顧

Dr. Chao Shen-chang
趙盛章博士

Vice President and Group Director
Enterprise & Consumer Electronics Group
副總裁及研發群組總監
企業與消費電子群組

Dr. Chao Shen-chang joined ASTRI in September 2002 and founded the Enterprise and Consumer Electronics Group. He is responsible for the development and commercialization of technologies and applications in the areas of digital home, mobile multimedia communications, multimedia IP and SoC.

趙盛章博士於二零零二年九月加入應科院並創立企業與消費電子群組。他負責開發數碼家庭技術、移動多媒體通訊技術、多媒體IP及SoC技術，以及相關的應用產品平台，並將其商業化。

Three key technology initiatives
三個主要技術發展領域

The mission of the Enterprise & Consumer Electronics (ECE) Group is to create and expand Hong Kong's core intellectual property for multimedia and to develop 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.

ECE was established in 2004. Since then it has filed more than 60 patents regarding its core technologies and signed over 60 industrial contracts for technology dissemination, amounting to more than $35 million in contract value. More than 15 ECE products are being mass produced by customers in Hong Kong, the Mainland, Taiwan, Korea and Australia.

企業與消費電子群組的使命是要為香港創造和擴展自身擁有的核心知識產權（IP），包括基於IP的多媒體技術和互聯消費電子產品及應用等，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。

企業與消費電子群組於二零零四年成立。迄今已申請發明專利的核心技術超過六十項；與業界簽署的技術轉移合同超過六十份，總合同金額超過三千五百萬元；超過十五項研發成果成功被客戶採納並量產；獲技術授權的公司來自香港、中國內地、台灣、韓國和澳洲等地。

With the maturity of the wireless and broadband network infrastructures, the trend to use and share digital contents via networks, together with the convergence of computers, communication and consumer electronics, are growing at a fast pace. This has also brought about considerable business opportunities for developing new generations of wireless and multimedia consumer electronic devices, applications and services.

ASTRI is developing key technologies and building strong partnerships and strategic alliances with local, Mainland and overseas high-tech companies to obtain significant intellectual property and technology assets to position Hong Kong and the Pearl River Delta as a leading innovation and design centre for next-generation digital consumer electronics and applications.

ECE has three major ongoing programmes. They are Digital Home Technology, Mobile Multimedia Communications Technology and Multimedia Technology IP. Each programme offers a suite of licensable products and platforms. ECE has also established a Digital Living Platform which hosts the Digital Living Lab and supports the Digital Living Consortium with active participation from industry.

隨著無線及寬頻網絡的基礎建設日趨完善，透過網絡使用和分享數碼內容逐漸成為潮流，而電腦、通訊和消費電子的融合也日益普遍，為新興的下一代無線及多媒體消費電子器材、應用技術和服務等行業，帶來無限商機。

應科院研發重點科技，並與香港、中國內地和海外的高科技公司建立夥伴關係和策略聯盟，創造知識產權和科技資產，藉此把香港及珠三角定位為下一代消費電子產品和應用的創新及研發中心。

企業與消費電子群組有三個主要的技術發展領域，分別是數碼家庭技術、移動多媒體通訊技術及多媒體技術核心專利。每個技術發展領域均提供整套可授權予產業的產品及平台。企業與消費電子群組並且建立了數碼生活平台，主理數碼生活實驗室，支援數碼生活聯盟，並得到了業界的積極參與和支持。

Developments
發展

ECE has made significant efforts to help customers use its technology platforms to develop innovative and competitive products in pursuing business and market opportunities worldwide. A number of its products are available in different markets. The products include:

企業與消費電子群組為協助客戶利用其技術平台，開發創新和富競爭力的產品，把握商機及開拓全球市場，作出了很大努力。下列是群組在各地市場提供的科技產品：

Product/Technology 產品／技術	Market 市場
HD STB/PVR 高清機頂盒/個人視頻錄像	Hong Kong 香港
HMC Streamer in six shopping malls 以家庭媒體中心技術直播視頻頻道應用到六個大型購物商場	Hong Kong 香港
Wi-Fi phone Wi-Fi無線電話	Hong Kong, Korea and Europe 香港、韓國及歐洲
Emulation Board for Multimedia SoC 多媒體系統級晶片設計仿真版	The Mainland 中國內地
PDM based RTS 以移動多媒體平台為基礎的實時監控系統	The Mainland 中國內地
H.264 IPTV STB H.264網絡電視機頂盒	The Mainland 中國內地
iSIP phone iSIP電話	The Mainland, Taiwan and Europe 中國內地、台灣及歐洲
iDNS technology deployment 動態域名解析技術	Taiwan 台灣
Home Media Center 家庭媒體中心技術	Taiwan and Europe 台灣及歐洲
H.264 RTS H.264實時監控系統	Three international airports 三個國際機場
iShare eP2P platform in i-Cable Beijing Olympics 有線電視以iShare eP2P平台轉播北京奧運會	Hong Kong 香港

Major developments of the three ongoing programmes:

以下是三個技術領域組最新的發展概況：

Digital Home Technology (DHT)

DHT comprises two sub-programmes, namely Digital Broadcast Technology (DBT) and Home Media Technology (HMT).

DBT has developed HD STB platform (supporting DVB-T, DMB-T/H and IP Connection) and defined interactive TV middleware standard (Hong Kong Profile 1.0). TVB launched interactive TV services for the 2008 Olympics based on the first version of Hong Kong Profile. DBT currently focuses on developing new interactive MMI technology based on MEMS for better user interactive experience in digital life.

數碼家庭技術

數碼家庭技術組當中包含數碼廣播技術及家庭媒體技術兩個分組。

數碼廣播技術組開發了高清雙模機頂盒平台（支援DVB-T、DMB-T/H及IP連接）；並定義了香港互動電視中間件標準1.0，TVB就是根據此標準於二零零八年奧運會期間提供互動電視服務。目前數碼廣播技術組正在開發一種以MEMS為基礎的人機界面新技術，讓用戶可以在數碼生活中享受更好的互動體驗。

HMT has developed iShare eP2P technology supporting scalable and quality content delivery via open Internet. HMT currently focuses on a Digital Right Management solution for secure distribution of IPTV service via Internet based on the leading crypto technology - Broadcast Encryption.

i-Cable adopts ASTRI's i-share P2P technology for 2008 Beijing Olympics live broadcast on Internet.
有線電視採用應科院i-share P2P技術作二零零八年北京奧運會網上直播。

Mobile Multimedia Communications Technology (MMCT)

MMCT has developed the web 2.0 enabled Mobile Internet Device technology platform and mobile P2P networking technology for peer group formation and management. MMCT currently focuses on developing virtual directory technology for content sharing, personal content web search engine and innovative MMI for mobiles based on different sensing technologies such as image, motion and touch.

Multimedia Technology IP (MTI)

MTI has developed AVS format High Definition decoder IP, silicon tape-out of H.264 format HD decoder ASIC IP, and has successfully integrated audio enhancement IP into multimedia Audio Codec SoC ASIC. MTI currently focuses on developing AVS format High Definition encoder ASIC IP design and a very low cost multi-format H.264/AVS/MPEG2 Full HD Decoder SoC aimed at the HDTV STB market.

家庭媒體技術組目前重點開發在互聯網上的eP2P高質量可擴展的數碼內容傳輸技術，並致力研究用於網絡電視業務的廣播加密引擎技術，提供安全傳輸的數碼版權管理系統解決方案。

移動多媒體通訊技術

移動多媒體通訊技術組已開發了支援Web2.0的移動互聯網設備（MID）平台和應用於對等組網路形成及管理的移動P2P技術。目前重點發展虛擬目錄，可以應用在內容共享、個人內容的網絡搜索引擎；和創新的、基於不同傳感技術（例如圖像、動作和觸摸）的人機界面移動設備。

多媒體技術核心專利

多媒體技術核心專利組已開發了AVS格式的高解析解碼IP，完成H.264格式的高清解碼器專用集成電路下線，及成功結合音頻增進IP於多媒體音頻編解碼器系統級專用集成電路。目前集中研究AVS格式高清編碼器專用集成電路IP的設計，與及一個以高清電視機頂盒市場為目標之超低價多格式H.264/AVS/MPEG2全高清解碼器系統級晶片。

Partnering with TVB to launch Interactive TV in Hong Kong.
夥拍香港電視廣播有限公司啟動香港互動電視。

Intelligent home.
智能家居。

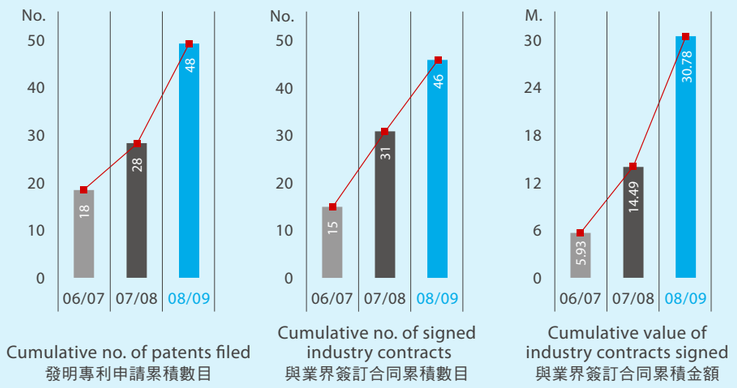
Achievements
成果

Since the launching of R&D Centre for ICT on 20 April, 2006, ECE has signed more than 40 industrial contracts for disseminating technologies with contract value totaling close to $31 million as at 31 March, 2009. The licensees include companies in Hong Kong, the Mainland, Taiwan, Korea and Australia. ECE has filed 48 patents during the period, with two granted in the United States and one on the Mainland.

A summary of the number of industry contracts signed, contract values and the number of patents filed from 20 April, 2006 to 31 March, 2009 is presented below:

自香港資訊及通訊技術研發中心於二零零六年四月二十日成立以來，企業與消費電子群組與業界簽訂合同超過四十份，以進行技術轉移，截至二零零九年三月三十一日，從業界獲得總合同金額接近三千一百萬元。獲技術授權的公司來自香港、中國內地、台灣、韓國和澳洲。群組於上述期間申請的發明專利共四十八項，其中兩項在美國、一項在中國內地已成功獲得通過。

企業與消費電子群組於二零零六年四月二十日至二零零九年三月三十一日期間與業界簽訂的合同數目及金額，與及申請的發明專利數目如下圖：



i-Cable Live Streaming during 2008 Beijing Olympics
i-Cable launched a 16-day exclusive free Internet live broadcasting during the 2008 Beijing Olympics using ASTRI's iShare P2P technology for network transmission to guarantee stability and smoothness.

Hong Kong Interactive (iTV) Standard
ASTRI is the owner of HK iTV standard which forms the backbone of Digital Terrestrial Television (DTT) in Hong Kong. The launch of this world's first high definition interactive TV service was officially announced at a special event on 31 July, 2008, in front of more than 300 guests from the Government departments, industries and the media. Since its launch, there are more than 200,000 users (via STB or iDTV) of these middleware technologies in Hong Kong, boosting Hong Kong's DTV penetration by at least 10 per cent.

有線電視直播二零零八年北京奧運會
有線電視在二零零八年北京奧運會期間，使用應科院研發的iShare P2P技術，為市民大眾提供十六天免費互聯網網上賽事直播。iShare P2P技術能確保網路傳輸的穩定性和流暢性。

香港互動電視（iTV）標準
應科院是香港數碼地面電視（DTT）關鍵中間件標準（香港互動電視規格）的擁有者。二零零八年七月三十一日，香港推出全球首個高清互動電視服務，出席啟動儀式者超過300人，包括政府官員、產業代表及香港主要媒體。自高清互動電視啟播以來，每天共有超過二十萬用戶（通過機頂盒或一體機）使用這些中間件技術，令香港數碼廣播電視的滲透率至少提高了十個百份比。

Multimedia Audio Codec SoC ASIC
Commercial multimedia Audio Codec SoC ASIC in Silterra 0.18μm CMOS Technology for audio consumer electronics products, digital photo frames, MP3 players, boom boxes, home-theatres and in-car entertainment systems are being mass produced.

Multi-channel Voice Module
The Multi-channel Voice module has been put into commercial use by a leading Mainland provider of network testing solutions for developing a massive automatic call testing system for 2G and 3G mobile networks.

Award in Taiwan
ASTRI's HMC (Home Media Center) design helped our Taiwan licensing partner develop new TV box and win the 2008 Taiwan Excellence Gold Award. Equipped with new technology in Internet media, the product quickly won consumer acceptance and became the number one brand TV box in Taiwan last year.

Digital Living Consortium (DLC)
A working group on MHEG-5 Hong Kong Profile for Interactive TV has been formed under the DLC umbrella. The group has 18 members. Besides organising forums and seminars, it publishes technical reports.

多媒體音頻編解碼器系統級專用集成電路
商用多媒體音頻編解碼器系統級專用集成電路Silterra 0.18μm CMOS技術晶片，現已投入大量生產中，適用於多種電子產品，如數碼相框、MP3播放器、便攜式音響、家庭影院和車載系統。

多通道語音模塊
多通道語音模塊被中國內地一家具領導地位的網路測試方案供應商採納並商品化，用於開發大規模2G和3G自動呼叫測試系統。

在台灣獲獎
企業與消費電子群組成功協助台灣合作夥伴利用應科院的家用媒體中心技術開發新型電視盒，並贏得二零零八年「台灣精品金質獎」。該產品由於採用了新型互聯網媒體技術，很快便獲得消費者認同，成為台灣二零零八年第一品牌的電視盒。

數碼生活聯盟
數碼生活聯盟成立了MHEG5 - Hong Kong Profile工作小組，以制訂和推動互動電視標準。數碼生活聯盟現有會員十八名，除了舉辦科技論壇及講座，也刊登科技研究報告。

Project Highlights
重點研發項目

Industry Collaborative Project 業界合作項目 Full Project 正式項目 Seed Project 種子項目

	Project 項目	Description 內容	Date 日期
1	iShare Media Sharing Platform	This project develops a generic iShare Media Sharing platform for the fast growing broadband and multimedia consumer electronics market. It builds upon existing HMC technology modules and expands towards an embedded, versatile, many-to-many coordinated and distributed content sharing and delivery platform. It aims at overcoming the many difficulties and challenges in utilizing the Internet as a means for broadcasting video contents to mass audiences. The goal is to enable a TV/Media-anywhere platform using existing Internet infrastructure and broadly available consumer electronics devices to bring live or stored video contents to viewers and Internet users any place, any time.	Dec 2007 ~ Dec 2008
	iShare媒體傳輸共享平台	本項目針對快速發展的寬頻和多媒體消費電子市場，開發一款通用的iShare媒體傳輸共享平台。此平台建基於家庭媒體中心（HMC）技術模塊，並擴大至嵌入式、多功能、多端協調和分佈式內容共享和傳輸平台。目標是克服在利用互聯網作為向大眾進行視頻內容廣播渠道所存在的問題和挑戰。利用現存的互聯網架構和消費者電子設備來組建可在任何地方享用電視／媒體的平台，用者可以隨時隨地把實時或者已存儲的視頻內容傳送至電視收看用戶和互聯網用戶。	二零零七年十二月至二零零八年十二月
2	Broadcast Encryption for P2P Streaming	This project develops a broadcast encryption engine for P2P content distribution and DRM solution which overcomes challenges to deliver a scalable and secure video broadcasting platform for service providers to enable the eP2P-based IPTV services and applications via the Internet.	Sep 2008 ~ Mar 2009
	用於點對點IP流媒體的廣播加密方案	本項目開發一種適用於P2P內容分發和數碼版權管理方案的廣播加密引擎，為互聯網服務供應商提供一個可擴展及安全的視像廣播平台，以便可以eP2P為基礎在互聯網上提供網絡電視服務和應用。	二零零八年九月至二零零九年三月
3	Social Networking Internet Tablet (SNIT)	This device utilizes Maemo as the standard open Linux development environment to create a mobile Internet device platform focusing on social networking applications. It mobilizes Internet and social network.	Aug 2008 ~ Jul 2009
	社交互聯網隨身機	以Maemo作為標準Linux開發平台而研發的移動互聯網終端（MID）設備平台，重點開發MID上的社交網路應用，致力實現互聯網及社交網路的移動化。	二零零八年八月至二零零九年七月
4	Mobile Peer Group Service Platform (MPGSP)	This project offers a development platform for third parties to build secure, peer-group-based networking and data sharing applications. It also offers service providers a variety of likewise services with technology focused on high availability of resources and mobile devices' transient nature.	Dec 2008 ~ Dec 2009
	移動對等網路服務平台	本項目為第三方提供一個開發平台，來建立安全的、基於對等組網路及數據共享的應用。互聯網服務供應商可以利用此平台提供多種服務，特別針對用於達成資源的高可用性及移動設備自組網的短暫特性的應用。	二零零八年十二月至二零零九年十二月
5	H.264 1080P Full HD Video Decoder ASIC (MMP-SiP)	This project develops a H.264 format with resolution up to 1080p so-called Full High-Definition Video Decoder ASIC Chip in TSMC 0.13µm CMOS Technology. It also serves as the base for multimedia video decoder SoC design platform supporting multi-CODEC solution that focuses on customer's specific requirements. The key features provided by this platform include: • TSMC 0.13µm CMOS 1P8M generic process H.264 High Profile Video Decoder in HD 1080p resolution capability; • A 250 MHz operation supporting all resolutions from 480i to 1080p; • Support to two DDR2 SDRAM 533MHz, each up to 512Mbit; and • Internal high performance PLL allowing single crystal to generate clocks. Available in discrete ASIC sampling chips and reference design demo.	Jun 2008 ~ Aug 2009
	H.264 1080P全高清視頻解碼器ASIC (MMP-SiP)	本項目開發一個H.264格式、解析度高達1080p，名為全高清視頻解碼器台積電0.13µm CMOS的專用集成電路技術晶片。它亦可用作支援多編解碼方案的多媒體視頻解碼系統級晶片設計平台，尤其可配合客戶之個別設計要求。此平台的主要特點包括： • 台積電0.13µm CMOS 1P8M通稱進程H.264高清1080p解析度的高檔視頻解碼能力； • 250MHz操作，支援所有由480i到1080p之解析度； • 支援兩組DDR2 SDRAM 533MHz，每組達512Mbit；及 • 內置高效率PLL容許以單晶體振盪器產生所有必需的時鐘。 提供晶片樣本和參考設計示範。	二零零八年六月至二零零九年八月

	Project 項目	Description 內容	Date 日期
6	AVS 1080P Full HD Video Decoder ASIC (MMP-SiP)	This project develops a China Standard AVS 1.0 format with resolution up to 1080p so-called Full High-Definition Video Decoder ASIC Chip in TSMC 0.13µm CMOS Technology. It also serves as the base for multimedia video decoder SoC design platform supporting multi-CODEC solution that focuses on customer's specific requirements. The key features provided by this platform include: • TSMC 0.13µm CMOS 1P8M generic process AVS Video Decoder in HD 1080p resolution capability; • A 200 MHz operation supporting all resolutions from 480i to 1080p; • Support to two DDR2 SDRAM 533MHz, each up to 512Mbit; and • Internal high performance PLL allowing single crystal to generate clocks. Discrete ASIC sampling chips and reference design demo are coming in autumn 2009.	Jun 2008 ~ Aug 2009
	AVS 1080P全高清視頻解碼器ASIC (MMP-SiP)	本項目開發一個中國標準AVS 1.0格式，解析度高達1080p，名為全高清視頻解碼器台積電0.13µm CMOS的專用集成電路技術晶片。它亦可作為支援多編解碼方案的多媒體視頻解碼系統級晶片設計平台，尤其可配合客戶之個別設計要求。此平台的主要特點包括: • 台積電0.13µm CMOS 1P8M製程AVS高清1080p解析度的視頻解碼能力； • 200MHz操作，支援所有由480i到1080p之解析度； • 支援兩組DDR2 SDRAM 533MHz，每組達512Mbit；及 • 內置高效率PLL容許以單晶體振盪器產生所有必需的時鐘。 二零零九年秋季提供晶片樣本和參考設計示範。	二零零八年六月至 二零零九年八月
7	Motion Sensor Man Machine Interface (MMI) Technology	A prototype and feasibility study to develop the next generation MMI technology using MEMS-based motion sensing technology for next generation TV remote controller.	Aug 2008 ~ Jan 2009
	基於運動傳感器人機界面技術	為了發展新一代使用基於運動傳感器人機界面技術的電視遙控器，而進行的可行性研究和原型開發。	二零零八年八月至 二零零九年一月
8	Interactive TV Technologies Platform	This project develops TV centric interactive technologies for converging Digital TV and IP network connection to meet the fast growing and strong demand in Hong Kong, the Mainland, Taiwan and global markets. The key features of this platform include: • HK Interactive TV standard (HK Profile) 1.0 specification and reference implementation on HD STB platform; • Interactive Browser engine browser implementation; • HD STB (supporting DMB-T/H and DVB-T standards) enhancements such as DVB dual recording, PiP, AV recording, etc; and • Real time streaming and VOD features via IP network.	Jan 2008 ~ Apr 2009
	互動電視技術平台	本項目開發以電視為中心，融合了數碼電視和IP網絡的互動技術，以配合香港、中國內地、台灣和全球這些發展迅速和需求不斷增加的市場。此技術平台主要特點包括： • 香港互動電視標準（香港規格）1.0規範，以及在高清機頂盒的硬件平台上實現參考設計； • 互動瀏覽器引擎的實現； • 功能提升的高清機頂盒（支援DMB-T/H和DVB-T標準），支援DVB雙錄影、畫中畫及外部視頻錄影等功能；及 • 通過IP網絡進行實時視頻傳播和隨選視頻功能。	二零零八年一月至 二零零九年四月
9	Multimedia Audio Codec SoC ASIC (OMM-SoC)	This project develops a commercial multimedia Audio Codec SoC ASIC in Silterra 0.18µm CMOS Technology, with servo control and onboard hardware peripherals such as USB and external CD/DVD controllers, as well as a suite of powerful audio processing blocks (namely bass enhancement, five-band equalizer and spatial enhancement), for enriching audio experience. Such an Audio Codec SoC ASIC provides differentiating features for audio electronics products such as digital photo frames, MP3 players, boom boxes, home-theatres and in-car entertainment systems. Discrete ASIC sampling chips and reference design demo are coming by year-end 2009.	Jul 2008 ~ Jul 2009
	多媒體音頻編解碼器系統級專用集成電路 (OMM-SoC)	本項目開發一個商用多媒體音頻編解碼器系統級專用集成電路Silterra 0.18µm CMOS技術晶片，帶伺服控制及USB硬件外掛設備和CD/DVD控制器，以及一系列功能強大的音頻處理模組塊（低音增色、五段平衡和空間感增色），以提高音頻音效。此多媒體音頻編解碼器系統級專用集成電路，為音頻電子產品如數碼相框、MP3播放器、便攜式音響、家庭影院和車載系統等，提供多項特別功能。晶片樣本和參考設計將於二零零九年底提供。	二零零八年七月至 二零零九年七月

	Project 項目	Description 內容	Date 日期
10	Intelligent Home	This project lays out the infrastructure and builds a prototype for Intelligent Home. A prototype gateway has been developed, allowing users to control home devices which are UPnP or IGRS compliant from a remote location with devices such as laptop, PDA or cell phone. A research was conducted on market requirements and consumer applications for intelligent homes. The result showed four types of control applications were more prevalent: entertainment, security, HVAC and lighting. For communication between control and device, related wireless and wired technology standards and their interoperability were examined.	May ~ Nov 2008
	智能家居	本項目主要是設計智能家居的架構和建設原型。一個能允許用戶從一個遠程位置，利用設備如筆記本電腦、個人數碼助理或手機來控制符合UPnP或IGRS的家居設備的閘道器已被開發。本項目對智能家居市場及消費者需求作出了研究調查，結果顯示市場在智能家居應用上的需求主要有娛樂、保安、空調及照明四方面。本項目並研究控制和接收之間的聯繫，把現有的無綫及有綫技術作出比較，並研究其互操作性。	二零零八年五月至十一月
11	AVS FPGA Video/Audio Decoder on Emulation Platform (MMP-AVS)	The AVS X-Profile Video/Audio decoder aims at developing FPGA proven IPs to support AVS decoder video applications.	Oct 2007 ~ Dec 2008
	AVS FPGA視頻/音頻解碼仿效平台(MMP-AVS)	AVS X-檔次視頻/音頻解碼目標在於發展FPGA認證IPs來支援AVS解碼視像應用項目。	二零零七年十月至二零零八年十二月
12	Future Multimedia Standards (FMS)	This project develops new compression coding tools for future multimedia standards in collaboration with four universities in Hong Kong (CityU, CUHK, PolyU and HKUST).	May 2008 ~ May 2010
	未來多媒體標準	應科院聯合本地四間大學（城大、中大、理大及科大）研發應用於新一代多媒體標準的新型編碼工具集。	二零零八年五月至二零一零年五月
13	Configurable Multi-standard Video Encoder with Embedded DSP Core and Hardware Accelerators (ENC-CMSD)	This project develops configurable multi-standard AVS video encoders, including AVS1.0 and AVS-S, with embedded DSP core and hardware accelerators design approach. In addition, a high performance and configurable DSP core-based FPGA development platform will be purchased to verify the design and deliver FPGA-proven IP.	Feb 2009 ~ Jan 2010
	帶嵌入式數碼訊號處理核心及硬體加速器之可調配多標準視頻解碼器（ENC-CMSD）	本項目開發一種基於可配置/可擴展嵌入式數碼訊號處理核心和硬件加速器的多標準視頻編碼器，此編碼器支緩AVS 1.0及AVS-S。將購置基於數碼訊號處理核心的FPGA開發平台來驗證這個解決方案的FPGA IP。	二零零九年二月至二零一零年一月

IC Design Group
集成電路設計群組

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

Review
回顧

Mr. David Kwong
鄺國權先生

Vice President and R&D Director
IC Design Group
副總裁及研發總監
集成電路設計群組

Mr. David Kwong joined ASTRI's IC Design group in August 2005 to establish R&D programmes in analogue and mixed signal IC design for portable applications.

鄺國權先生於二零零五年八月加入應科院集成電路設計群組，並發展應用在便攜式裝置的類比及混合訊號集成電路設計研發項目。

Applied SoC Design
應用系統晶片設計

Portable Analog and Mixed Signal Design
便攜式類比混合訊號設計

Two key technology initiatives
兩個重點技術發展領域

The global IC industry, despite the worldwide financial crisis and energy price fluctuations, showed significant growth last year registering business turnover of US$262 billion, compared with US$215 billion in 2004.

In recent years, strategic and modern facilities have been built to manufacture ICs on the Mainland, and a great amount of work on the core technology has been done to sustain the continuous growth of the electronics and manufacturing industries.

The Mainland has already been transformed from a manufacturing base into a design and development base. It is foreseeable that its electronics industry will gradually acquire the capability to serve as IC-design bases in the next decade, and will further grow into innovation driven enterprise.

ASTRI's IC Design (ICD) Group is conducting applied R&D in IC design technologies to enhance the industry's competitiveness, consolidate the technology foundation and sustain the IC design ecosystems in Hong Kong and the Pearl River Delta. R&D teams are combining their efforts to help the industry capture the best opportunities in the fast growing global semiconductor and electronics markets, especially in Hong Kong, the Mainland and Taiwan.

面對世界性金融危機和能源價格波動，環球集成電路產業去年仍有顯著增長，錄得二千六百二十億美元生意額；而二零零四年則為二千一百五十億美元。

近年，內地建造了策略性而現代化的設施來生產集成電路，而核心技術的大量工作用於維持電子及製造業的持續增長。

內地已從製造基地轉型成為設計和發展基地，預期在下一個十年，其電子產業將漸有能力成為集成電路設計基地，並進一步發展為由創新帶動的產業。

應科院集成電路設計群組在集成電路（IC）設計技術方面進行應用研發，以促進業界的競爭力，鞏固技術基礎，及維持香港和珠江三角洲地區的IC設計生態環境。研發小組同心協力，希望協助業界在增長迅速的全球半導體和電子市場，尤其是香港、中國內地和台灣市場，把握最佳的商機。

ICD currently focuses on two major areas: Portable Analog and Mixed Signal Design (PAD) and Applied SoC Design (ASD). Among the various projects are power management ICs, high speed data communication ICs, low power data converters, integrated LED drivers/controllers, LCD display enhancement controllers, solid-state storage controller, common platform for IP qualification and nanometer SoC design technologies. It is also developing expertise and technologies in semiconductor device modelling.

During the past year, ICD delivered services, consultation, IC prototypes, IC cores, IC design libraries and methodologies to its customers in Hong Kong and the Mainland, especially the Pearl River Delta. All these are important to their IC products and thereby enhance their competitiveness in global markets.

集成電路設計群組的研究重點主要有兩方面：便攜式類比混合訊號設計及應用系統晶片設計。具體項目包括：電源管理集成電路、高速數據傳輸集成電路、低功耗數據轉換器、綜合性LED驅動器/控制器、LCD顯示圖像改善控制器、固態存儲控制器、評測IP質量高低的通用平台及納米系統級晶片設計。此外群組也在器件模型領域進行研究和開發。

去年，集成電路設計群組為香港和內地，尤其是珠三角區的客戶提供了服務、咨詢、IC晶片、IC核、IC設計單元庫和方法等，對客戶的IC產品舉足輕重，增加其在全球市場的競爭力。

Developments
發展

CCD Camera Module.
CCD相機模組。

PAD Team

The PAD team introduced several new key technology initiative tracks during the past 12 months. The technology road map focused on high voltage analogue platform and advanced power management products using digital control algorithms. In addition, PAD initiated a semiconductor device R&D to tackle industry's long sought after ESD design capability. During the year, PAD signed contracts with companies in Hong Kong and the Mainland on R&D collaborations in the following areas:

- High speed colour video processing product development;
- Power management product development;
- High voltage analogue IC development;
- High speed communication product development; and
- ESD and device model development.

Design engineers measuring reference parameters of mixed signal SoC.
設計工程師正在量度混合訊號SoC的參數。

便攜式類比混合訊號設計組

集成電路設計群組轄下的便攜式類比混合訊號設計（PAD）組在過去十二個月引進了多條新的關鍵技術發展路線，焦點落在高壓模擬平台和應用數碼控制運算的先進電源管理模塊。另外，PAD組還啟動了半導體器件方面的研發工作，以滿足企業長久以來對靜電防護設計工程的需求。在這一年內，PAD組與一些香港及內地公司成功簽署了合作研發合同，範疇包括：

- 高速視頻處理產品研發；
- 電源管理產品研發；
- 高壓模擬IC研發；
- 高速通訊產品研發；及
- 靜電防護及器件模型研發。

Test setup for LED backlight control ASIC.
LED背光源控制晶片之測試組件。

ASD Team

The ASD team was established in the second half of 2005. It focuses on delivering world-class Silicon IP and Nanometer SoC Technology to customers in Hong Kong, the Mainland and Taiwan. To address customers' needs for high performance and low-power SoC, ASD develops low-power IC design and enhancement technologies targeting process nodes from deep-submicron (e.g. 0.13μm) to nanometer (e.g. 65nm). It has developed a comprehensive platform for IP qualification to provide customers with high quality IPs with its advanced, robust and silicon-proven design environment.

For the mainstream consumer market, ASD has an easy-to-use, low-entry point platform targeting Micro-controller (MCU) development, which is in great demand in Asia, especially from small design houses on the Mainland. MCUs are being used in almost all control functions in home appliances such as lighting, automotives and entertainment. Furthermore, ASD is developing a High Performance Storage Controller Platform with the adoption of Solid State Disk (SSD) technology to address tremendous demands of high performance NAND flash storage application in PC market.

To fully utilize ASTRI's expertise in different technological domains, ASD has collaborated internally with the Material & Packaging Technologies Group to develop LED backlight control and LCD display enhancement technologies into IC solutions. ASD also partners with major global customers to deliver customer-focused technologies that can be translated into practical applications. For instance, ASD has assisted a China-based major TV manufacturer to develop a video processing SoC.

All the above are accomplished by an R&D team with research and product development experience in system architecture, RTL coding, synthesis, timing analysis, backend design and silicon evaluation. Extensive experience together with industry-proven programme management will enable ASD to continue delivering IC solutions that will satisfy the needs of the fast changing market.

應用系統晶片設計組

應科院的應用系統晶片設計（ASD）組於二零零五年成立，主要為香港、內地和台灣的客戶提供世界級矽知識產權（IP）和納米系統晶片設計技術。為滿足客戶對晶片的高性能、低功耗的要求，ASD組開發了低功耗IC設計和良率提升技術，此技術能應用於從深亞微米（如0.13微米）到納米（如65納米）的IC產品。ASD組也開發了完善的知識產權質量評測平台，其目標是要充分利用先進及精湛的設計技術，為客戶提供更高質量的IC設計。

對於主流消費者市場，ASD組已開發了一個操作簡單、低成本、高增值的微控器設計平台，以應亞洲市場，尤其是內地小型設計公司的大量需求。微控器晶片可廣泛應用於不同領域的家居電子產品，包括照明系統、汽車及娛樂設備等。此外，ASD組正採用固態硬盤技術開發高性能存儲控制器平台，以應個人電腦市場對高性能NAND型快閃記憶體存儲控制技術的巨大需求。

ASD組為完全發揮應科院各技術群組的專長，積極推動內部合作，與材料及構裝技術群組共同開發了LED背光控制及LCD圖像顯示改善技術，以及把相關技術實現於IC上。此外，ASD組亦與來自全球的主要客戶建立夥伴關係，開發以顧客為導向的技術，轉化成實用的產品，例如ASD組最近協助一家大型中國電視機生產商開發視頻處理器晶片。

ASD組由擁有多方面經驗的資深科研人才組成，包括系統架構、RTL編碼、綜合、時序分析、後端設計和產品測試評估等。憑著業界認可的項目管理技能，加上豐富的研發經驗，ASD組將可以因應市場的快速轉變，繼續提供高水準的IC方案，滿足顧客需要。

Achievements
成果

The PAD team transferred LED Solid State Lighting products to four Hong Kong-based lighting manufacturers last year. The products provided manufacturers with high efficiency lighting driver to enable them to compete favourably in the world market. In addition, ASTRI successfully transferred the design of a colour CCD Image Processor to a local design house during 2008. The large scale System on a Chip (SoC) mixed signal design deployed many of the high speed signal processing building blocks developed by the PAD team. The PAD team also filed seven patents and signed nine contracts with local companies during the fiscal year. The ASD team achieved the following in the year under review:

Industry Transfer

ASD successfully made two industrial transfers to local and Mainland industries for commercialization:

- An 8-bit MCU Platform was licensed to a Hong Kong-based IC design company. The platform enables this purely analogue design house to successfully create mixed-signal SoC IC;
- A digital signal processing silicon IPs was transferred to a local IC design company for mass production. This IP is used in audio products -- wireless audio transmitter.

Industry Contributions

ASD secured contributions amounting to more than $3 million from local and Mainland partners, confirming the Group's contribution to industry.

Industry and University Collaboration

- In 2008/09, Hisense Electric Co., Ltd. developed the Dynamic LED Backlight Control technology with Material & Packaging Technologies Group and ASD for Hisense LED HDTV applications.
- In 2008, ASTRI's Chief Technology Officer Dr. Manuel Costa, signed an MOU with the Peking University Shenzhen Graduate School on a collaborative project with ASD.

去年，PAD組將LED固體發光產品成功轉移給四個香港光電製造商，這產品為製造商提供了高效的發光驅動器，讓他們在全球市場的競爭中佔據優勢。此外，應科院在二零零八年成功將彩色CCD圖像處理器轉移給本地設計公司，這個大規模的混合訊號片上系統（SoC）採用了PAD組的高速訊號處理模塊。本年度，PAD組成功申請了七項專利，並與九間本地公司簽署了聯合開發合同。而ASD組本年度的工作成績如下：

成果轉移

ASD組成功轉移了兩項技術至本地及內地業界，作商品化用途：

- 授權一家香港IC設計公司使用8-bit MCU平台，使這家本來僅發展模擬電路的公司得以進入混合訊號的SoC設計領域；
- 將一個數碼訊號處理硬件IP轉移至本地一家IC設計公司進行量產。該IP用於音頻產品—無線音頻轉換器中。

業界投入資金

ASD組成功地與本地和國內合作夥伴簽訂逾三百萬元業界投入資金，肯定了集成電路設計群組對業界作出的貢獻。

與業界和學界合作

- 二零零八／零九年度中，海信集團與應科院材料與構裝技術群組和ASD組合作開發靈活及自適應主動式動態LED背光控制技術，並將應用於海信LED高清晰度電視中。
- 二零零八年，應科院首席科技總監郭文偉博士代表ASD組與北京大學深圳研究生院簽署了一項合作協議。

Cumulative no. of patents filed by ICD
集成電路設計群組專利申請累積數目

Cumulative no. of technology transfers by ICD
集成電路設計群組技術轉移累積數目

No. - Number
數目

Technology Dissemination

- Director of Applied SoC Design Programme Mr. Li Yiu-kei, delivered keynote speech entitled "SoC IC Technology Research and the Collaboration Model" at the 2008 (Sixth) Pearl River Delta IC Industry Networking and Market Research Seminar.
- On 19 November, 2008, Senior Engineer Mr. Patrick Kong and Principal Engineer Mr. Mark Mok from ASD, joined the IP-based Integrated Circuits Technology International Summit in Shanghai and delivered a speech entitled "ASTRI's IP Qualification Platform".
- Mr. Chiu King-hung, Principal Engineer, ASD, delivered an informative presentation on the topic "LCD Display Enhancement Controller" during an ASTRI seminar on 20 January, 2009.
- Principal Consultant Mr. Craig Peterson addressed a technical seminar with a presentation entitled "Parallel DSP Array Design Concepts" at Peking University Shenzhen Graduate School on 11 February, 2009 and the Chinese University of Hong Kong on 24 March, 2009.

ASTRI Internal Collaboration

ASD has collaborated internally with other groups to demonstrate that combined strengths of different groups can significantly enhance the competitiveness of ASTRI's technologies:

- ASD collaborated with the Material & Packaging Technologies Group to develop LED backlight control and LCD display enhancement technologies into IC solutions;
- ASD also collaborated with the Communications Technologies Group to implement the SoC ICs on DVB and T-DMB demodulations.

技術交流

- ASD組總監李耀基先生，獲邀參加二零零八年（第六屆）珠三角集成電路產業聯誼暨市場研討會，並以「SoC集成電路技術研發和相關成果」為題作主題演講。
- 二零零八年十一月十九日，ASD組高級工程師江逸鴻先生和首席工程師莫秉燦先生，參加了在上海舉行的「基於IP的集成電路設計技術國際峰會」，並以「應科院的IP驗證平台」為題演講。
- ASD組首席工程師趙京雄先生在二零零九年一月二十日的應科院研討會上，作了題為「LCD顯示的增強控制」的演講。
- 集成電路設計群組首席顧問Craig Peterson先生應北京大學深圳研究生院和香港中文大學的邀請，分別於二零零九年二月十一日及三月二十四日舉行的技術研討會上演講，題為「並行DSP陣列設計理念」。

應科院內部合作

ASD組聯同其他部門的內部合作呈現了巨大的協同效應，有力地增強應科院技術在市場中的競爭力：

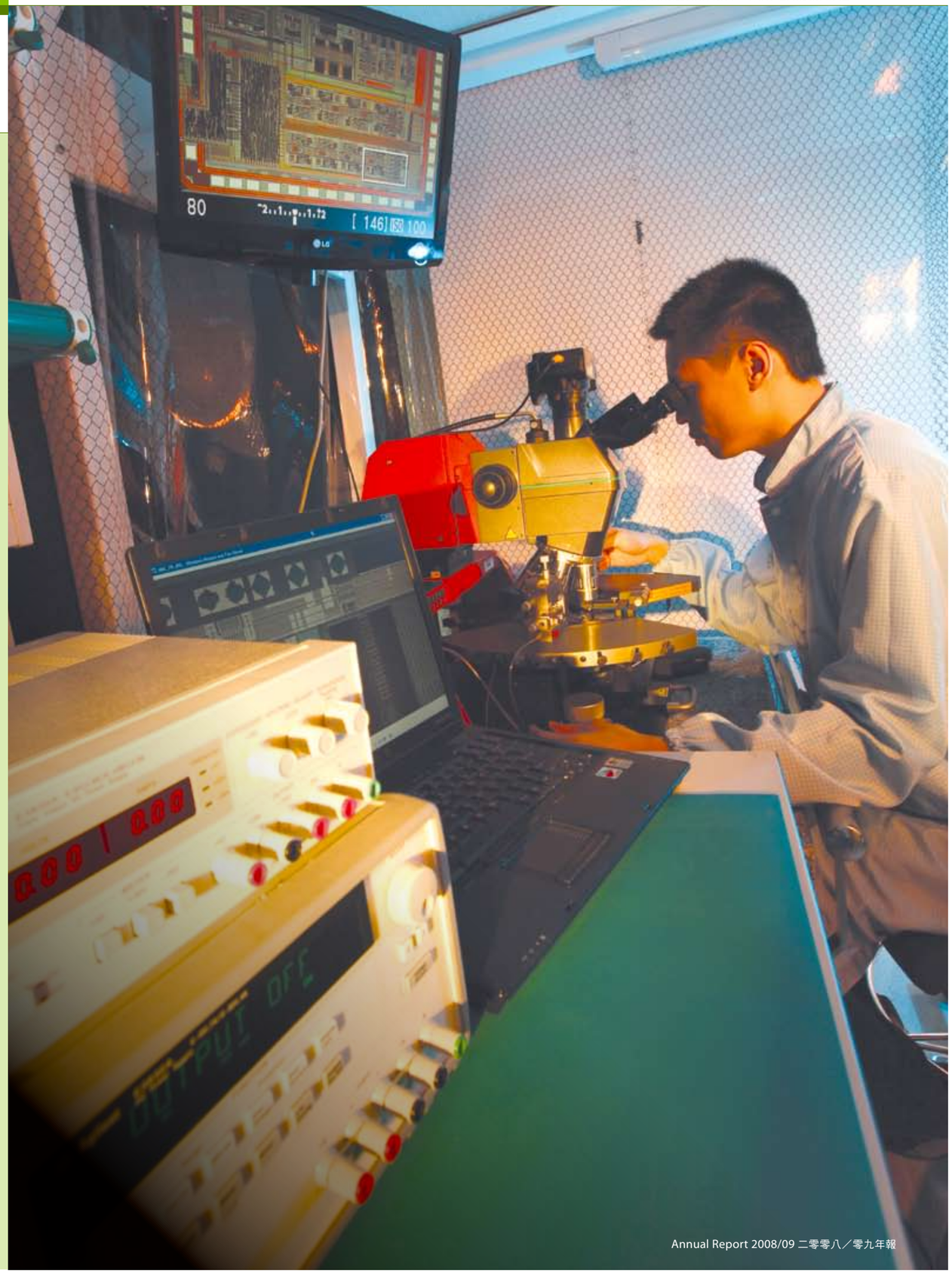
- ASD組與材料與構裝技術群組在LED背光控制技術和LCD顯示增強技術方面進行了有效的內部合作，整合完成一套完整的IC解決方案；
- ASD與通訊技術群組在DVB和T-DMB解調器SoC晶片化方面進行了有效的技術合作。

Project Highlights
重點研發項目

SH Shenzhen-Hong Kong Jointly Funded Project 深港聯合資助項目　Full Project 正式項目　Seed Project 種子項目

	Project 項目	Description 內容	Date 日期
1	Integrated LED Driver Technology for General Lighting 普通照明用綜合LED驅動技術	This low-cost LED lighting driver platform using locally produced IC drivers for general lighting applications developed by ICD represents a big boost to energy-saving lighting product manufacturers. 由集成電路設計群組研發的低成本LED照明驅動平台，採用了本地生產的普通照明用驅動IC，大力推動了節能產品的製造。	May 2008 ~ May 2009 二零零八年五月至二零零九年五月
2	Mixed Signal SoC Development Platform 混合訊號片上系統發展平台	This project delivers a design platform comprising a design methodology and a library of digital and analogue IP. Using this platform, local design engineers, even without extensive analogue design experience, can implement cost effective, mixed signal applications specific system on a single chip (SoC) for their products. 本項目提供了一個包含了設計方法學及數碼模擬IP庫的設計平台。本地設計人員使用這個平台，就算沒有模擬電路設計經驗也可以做出具成本效益的混合訊號片上系統產品。	Mar 2008 ~ Sep 2009 二零零八年三月至二零零九年九月
3	CCD Camera Analogue Front End (AFE) Single Chip IC for Security Camera 為保安攝影而設計的CCD攝像機前置模擬單晶片IC	The CCD camera AFE IC designed with mixed signal process enables industrial partners to build single chip image processors that normally require three separate chips. CCD攝像機前置模擬IC採用混合訊號工藝設計，使製作圖像處理器時只需使用一塊晶片，在此以前通常要使用三塊不同的晶片。	Jan 2007 ~ Nov 2008 二零零七年一月至二零零八年十一月
4	Simulation Design of ESD Structures ESD結構模擬設計	This project develops methodology by which ESD structures can be designed and evaluated on the basis of process and device structures. 本項目發展了一套方法學，可以基於程序和器件結構進行ESD保護結構的設計和評估。	Aug 2008 ~ Feb 2009 二零零八年八月至二零零九年二月
5	Ultra-low Energy Data Converter Technologies 極低能量數據轉換技術	This project builds the best-in-class data converter platform to satisfy the stringent energy consumption requirement while maintaining good speed and resolution. 本項目建立了一個最佳的數據轉換平台，能在特別嚴格的能量消耗要求下處理數據，並保持良好轉換速度及解析度。	Jan ~ Jun 2009 二零零九年一月至六月
6	Intellectual Property Qualification 知識產權驗證平台	This project focuses on establishing a quality indexing scheme for IP in various forms, through review checklist and trail implementation. This quality indexing scheme is based on IP qualification platform developed by HKUST Greater China Silicon IP Trading Centre. 此項目通過用戶評論和試用為各種不同形式的知識產權建立一個質量索引體系；此質量索引體系建基於香港科技大學大中華半導體知識產權交易中心開發的IP驗證平台。	Mar ~ Sep 2008 二零零八年三月至九月
7	Flexible and Adaptive – Active Dynamic LED Backlight Control ASIC Development 靈活及自適應主動式動態LED背光控制	This project develops an ASIC to implement an advanced adaptive algorithm to capture the advantages of both Gray level only and RGB local dimming. It will deliver the promise of even higher image quality improvement and energy-saving. The new scheme will choose its dimming approach based on current image frame characteristics. Added to that, each LED module will have a different set of design parameters – panel size, LED to LCD pixel ratio and LED light distribution profile. The implementation of the adaptive scheme will be configurable to cover the most prevalent panel configurations and characteristics in industry. The obvious technical benefits of this new solution are improved image quality, increased contrast ratio and power saving. Furthermore, ICD's flexible hardware implementation allows industry partners to adopt its solution on multiple LED-based display systems without the need to re-design and re-spin the ASIC. Substantial cost saving is thus achieved. 此項目利用一個專用集成電路晶片實現一項高級自適應算法，該算法可以兼具灰度級別調整和RGB區域亮度控制的優點，這將提高圖像質量和降低功耗。新的亮度調節方法將基於現在的圖像幀特性。 另外，新的LED模塊將採用一組不同的設計參數：面板尺寸、LED與LCD像素比例、LED發光特性等。此自適應算法是可以配置的，涵蓋現在業界最通用的面板參數和特性。 本新方案技術上明顯的好處在於提升了圖像質素、增強了對比度及節省功耗。此外，集成電路設計群組靈活的硬件實現方式讓業界合作夥伴於多個以LED為基礎的顯示系統上採用其解決方案，而不用重新設計或者重新下線，從而節省大量成本。	Jun 2008 ~ Jul 2009 二零零八年六月至二零零九年七月

	Project 項目	Description 內容	Date 日期
SH 8	Development of Structured ASIC Platform	Structured ASIC is an intermediate technology between ASIC and FPGA offering high performance (a characteristic of ASIC) and low NRE cost (a characteristic of FPGA). Using Structured ASIC allows products to be introduced quickly to market, to have lower cost and to be designed with ease. The objective is to open new opportunities in the Programmable Logic Device market based on Structured ASIC. The development focus of this "Shenzhen-Hong Kong Jointly Funded Project" is to build a mechanism for Structured ASIC creation.	Mar 2008 ~ Jul 2009
	組合ASIC設計架構開發	組合ASIC是一種介於ASIC和FPGA之間的技術。能夠如ASIC般提供高性能，並且像FPGA降低設計中的一次性費用。使用組合ASIC可以加速產品推出市場時間，降低產品開發成本和難度。此項目的目標是在可編程邏輯器件市場中為組合ASIC開發新商機。本項目是「深港聯合資助項目」中的一項，目的在於為組合ASIC建立創造機制。	二零零八年三月至二零零九年七月



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

Review
回顧

Dr. Wu Enboa
吳恩柏博士

Vice President and Group Director
Material & Packaging Technologies Group
副總裁及研發群組總監
材料與構裝技術群組

Dr. Wu Enboa joined ASTRI in 2005 and he founded the Material & Packaging Technologies Group. He is responsible for development and commercialization of technologies in the general area of material and packaging, including LEDs, advanced packaging, photonic components and micro-systems.

吳恩柏博士於二零零五年加入應科院並創建材料與構裝技術群組。他負責發展發光二極體、先進電子構裝及應用技術、光電子模塊及光機電子模塊技術，以及微系統技術。

Four key technology initiatives
四個重點技術發展領域

Since establishment in 2005, the Material & Packaging Technologies Group (MPT) has focused on developing high-value, next-generation technologies and products in the form of devices, components, modules and system integration that are differentiated mainly by material and packaging technologies.

During the year, MPT filed 33 patent applications in the United States, bringing the total number to 101. With continuous innovations and breakthroughs, MPT received several international awards, including a product innovation award in the Mainland's largest National Solid State Lighting Innovation Contest (2008), Best Paper Awards in International Conference on Electronic Packaging Technology (ICEPT) (2008), the largest international packaging-related conference on the Mainland, and an Outstanding Poster Paper Award in International Display Workshop (IDW) (2008) in Japan.

材料與構裝技術群組於二零零五年成立，一直致力研發高增值的新一代技術和產品，包括以先進的材料和構裝技術開發的器件、元件、模塊及系統集成技術。

材料與構裝技術群組在本年度共申請了三十三項美國發明專利，累計美國發明專利申請共達一零一份。群組經不斷創新和突破，本年度多次獲得國際性獎項，包括中國半導體照明競賽「創新產品獎」；中國最大的國際性構裝會議—二零零八年中國電子封裝技術國際會議「最佳論文獎」；及二零零八年日本國際顯示器會議「最佳展示論文獎」。

In the area of industry support, MPT performed well meeting the increasing needs and demands of industries, especially from Hong Kong and the Mainland. During the year, the Group signed 20 contracts with industry partners, bringing in more than $14 million in industry contributions, 93 per cent of the contributions came from companies in Hong Kong and the Mainland.

群組亦對企業作出了有效的支持，積極支援香港和內地企業不斷增加的需求。本年度，群組與企業夥伴共簽訂了二十份合同，業界投入資金合計超過一千四百萬元，當中有百分之九十三的企業投資是來自香港及內地的公司。

Developments
發展

LED Programme

During the year, MPT's LED Programme filed 19 patent applications in the United States, strengthening its core technology platform. The Programme has also signed eight industry contracts for technology dissemination. Since 2005, the filed U.S. patents and industry contracts in the LED area have accumulated to 64 and 16 respectively. The research focus of the Programme is on LED Devices, General Lighting and Display System.

Six-module LED street lamp.
六模塊式LED路燈。

The LED Devices Division has been developing unique vertical power LED chip technology using a modified polishing method for sapphire removal. This patent-protected technology aims at developing low-cost, high-yield LED chips while by-passing the laser lift-off related patents. As a result of this successful development, two tier-1 companies on the Mainland and Taiwan have signed contracts with the Division to license this unique technology.

發光二極體組

發光二極體（LED）組於本年度申請了十九項美國發明專利，以強化既有的核心技術平台；也與業界簽訂了八份合同，持續進行技術授權。該組由二零零五年成立至今已申請共六十四項美國發明專利，與業界簽訂的技術授權合同亦累積至十六份之多。該組研發重點為LED器件、通用照明及顯示系統。

在LED器件方面，該組利用改進型化學研磨法均勻剝離整片藍寶石基板，開發了獨有的垂直結構LED晶片技術。這項有專利保護的低成本、高良率技術迴避了傳統的激光剝離法專利。這項獨特的技術已授權予兩家在內地與台灣知名的晶片製造商。

Pico-Projector (embedded module).
微型投影系統（嵌入式模塊）。

User-friendly touch panel lighting control system.
操作簡易觸控型燈控系統。

Brightness and colour uniformity measurement for flat panel display.
平面顯示器光度和色彩均勻度的量度。

The General Lighting Division has successfully built two different LED-based street lamp prototypes to serve emerging needs in Hong Kong and the Mainland. The prototypes comply with standards in Hong Kong, the Mainland and Taiwan, and were licensed to three manufacturers in Hong Kong and the Mainland. In addition, two U.S. patents were granted in 2008 for unique LED-related thermal and electrical solutions for both indoor and outdoor lighting applications. The proprietary thermal solution was implemented into MR16 and is being mass-produced by a Hong Kong licensee.

The Display System Division continued the successful development of the high-dynamic-range local dimming LCD TV technology, which resulted in the successful licensing of the technology to four tier-1 companies in Hong Kong and the Mainland. In addition, the Division developed a 6cc-sized Pico-Projector with low power and ubiquitous display features especially for cell phones. This successful development has attracted a tier-1 Shenzhen-based company to sign a technology licensing contract for production.

在通用照明方面，因應香港及內地市場的熱切需求，該組成功開發了兩款高亮度LED路燈方案。該兩款方案符合香港、內地及台灣的道路使用標準，並已授權予香港及內地的三家路燈製造商。此外，在室內及戶外照明應用方面，該組藉其獨特的LED熱管理及供電方案，於二零零八年取得兩項美國發明專利。其中熱管理方案已用於該組的MR16射燈，並已授權予一家香港製造商大量生產。

在顯示系統方面，該組除已將高動態範圍、區塊控制液晶顯示技術授權予四家香港及內地的知名企業外，還開發了體積小至六厘米的微型顯示器投影系統，期望將低功耗、具嵌入式微型投影功能的手機普及化。這項研發技術已授權予一家深圳的知名企業投產。

Advanced Packaging Technologies (APT) Programme

During the year, the APT Programme filed seven patents in the United States for innovative advanced packaging technologies. The Programme also signed nine industry contracts for technology dissemination. Since 2005, the filed U.S. patents and signed industry contracts in advanced packaging have accumulated to 15 and 22 respectively. Its current research focuses on advanced electronic packaging design, modelling and simulation, failure analysis and characterization related technologies essential for next-generation electronic products. Building on its remarkable track records and experience, the APT Programme further utilizes its advanced packaging technologies for sub-system and full-system integration to strengthen the electronics industries in Hong Kong and the Mainland. Examples are:

(a) Advanced System-in-Package (SiP) for critical components in portable electronics:
   - Organic substrate-based packaging, e.g. developed and demonstrated the world's smallest FEM (Front-End Module) (3x3x0.45 mm^3) for WLAN; and
   - Ceramic substrate-based packaging.

(b) 3D Packaging Technologies – contributions from several tier-1 international companies on the Mainland were received. The key developments are:
   - Measurement-based design advisor for 3D packaging; and
   - Design, modelling, simulation and process optimization of Package on Package (PoP) and through-silicon-via (TSV) related technologies.

(c) Development and commercialization of key IC Packaging Technologies for Tyre Pressure Monitoring System (TPMS), including batteryless TPMS.

(d) Low-cost Healthcare Electronics Technologies including:
   - Intelligent insole; and
   - Vital signs, e.g. heart rate and photoplethysmograph (PPG), measurement device and electrocardiogram (ECG).

APTC organises seminars for its members on a regular basis.
先進構裝技術聯盟定期為會員舉辦研討會。

先進構裝技術組

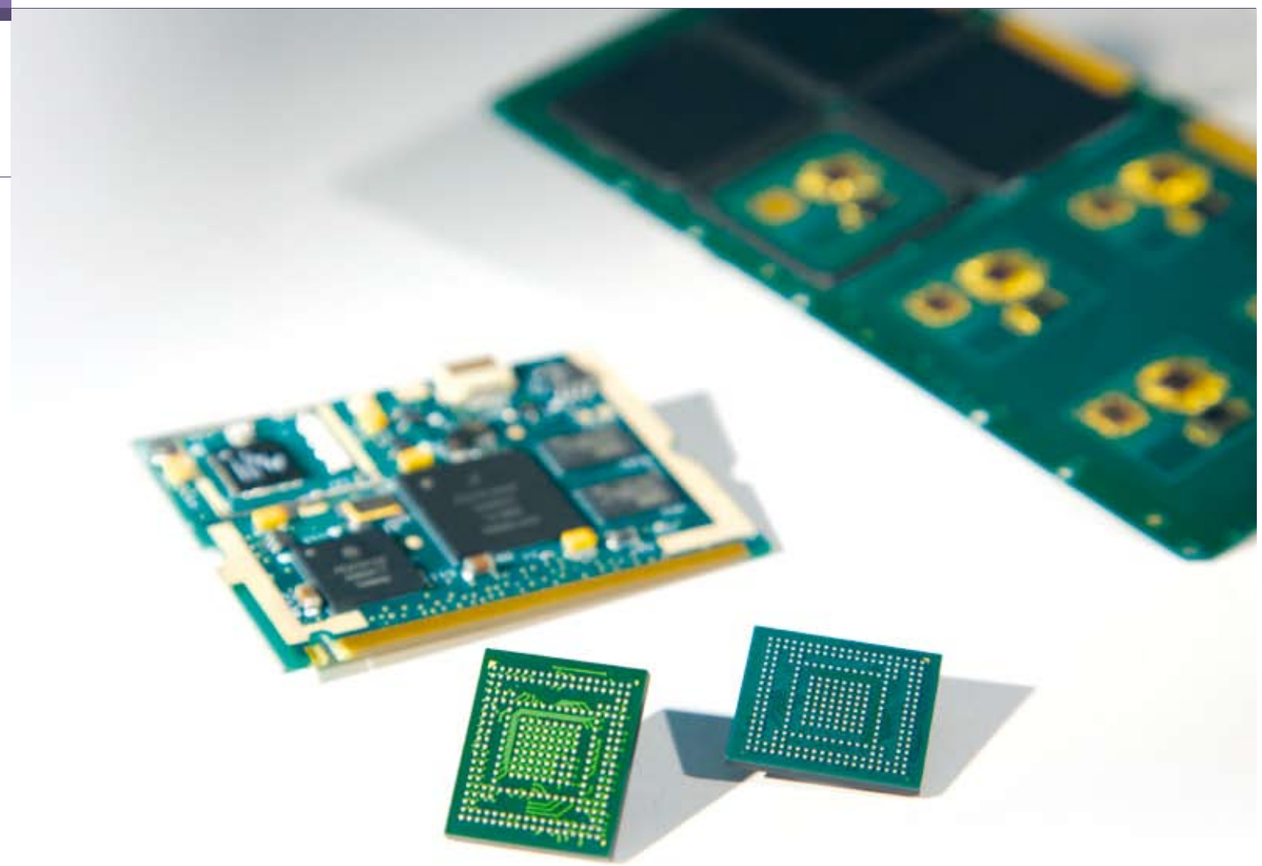
本年度，先進構裝技術組申請了七項有關先進構裝創新技術的美國發明專利，同時也與業界簽訂了九份合同，持續進行技術授權。由二零零五年成立至今，該組已申請十五項美國發明專利，與業界簽訂的技術授權合同達二十二份之多。該組主要研發先進電子構裝設計、仿真及模擬、壞品分析和特性化相關技術，以配合新一代電子產品的需要。憑著豐富經驗，先進構裝技術組能有效地利用先進構裝技術把子系統及全系統融合，以推動香港和內地電子業界的發展，例如：

(a) 使用於便攜式電子元件產品的先進系統級構裝：
   - 有機基板構裝–如全球最小尺寸的WLAN前端模塊（3x3x0.45 mm^3）；
   - 陶瓷基板構裝。

(b) 三維構裝技術—已得數家位於內地的國際一級大廠投放資金。主要研發為：
   - 以量度數據為基礎的三維構裝設計顧問軟件；
   - 封裝堆疊及矽穿孔相關技術的設計、仿真、模擬及工序優化。

(c) 開發可產業化的用於胎壓監測系統的關鍵積體電路構裝技術，包括無電池的胎壓監測系統。

(d) 低成本醫療保健電子技術，包括：
   - 智慧型鞋墊；
   - 生命訊息監測，如心跳、血管容積變化訊號、測量器及心電圖等。



System-in-Package developed by APT can achieve size reduction by at least 44%.
先進構裝技術組開發的系統級構裝，尺寸可大幅縮小至少44%。

Furthermore, an Advanced Packaging Technologies Consortium (APTC) has been established since 2006. During the year, it attracted six new members. APTC serves as a platform promoting microelectronics packaging technologies for industry. Currently, it has 31 members, including subcontractors, IDMs and companies specialized in packaging design and equipment. The member companies include ASM, Flextronics, Henkel, Intel, NXP, SAE Magnetics and SMIC. Also among its members are famous universities including Fudan University, Hong Kong University of Science and Technology, Peking University, Shanghai Jiaotung University and Tsinghua University.

此外，應科院於二零零六年成立了「先進構裝技術聯盟」，為業界提供了一個彼此交流，促進合作和技術轉移的平台。聯盟在本年度新增了六個會員單位，自成立至今已有三十一個會員，當中包括轉包商、集成器件製造商、構裝設計工藝及設備公司，如ASM、Flextronics、Henkel、Intel、NXP、SAE Magnetics及SMIC等，此外亦包括多家知名大學如復旦大學、香港科技大學、北京大學、上海交通大學及清華大學等。

Photonic Components (PC) Programme

During the year, the PC Programme filed seven patents in the United States for innovative compact camera modules. It signed three industry contracts for technology dissemination. Since 2005, the filed U.S. patents and industry contracts in photonic components have accumulated to 22 and seven respectively. The current research of the Programme focuses on developing the next-generation Advanced Compact Camera Module (ACCM) technology for mobile phone and portable multimedia applications.

To enhance the camera performance of a mobile phone, the PC Programme has developed an optical-based, anti-shaking technology which controls the motion of the optical lens to eliminate blurring of the picture caused by vibration during the exposure period. The uniqueness of this technology is the size of the voice coil motor (VCM). Because of the unique design of the VCM, the optical anti-shaking and auto-focus camera module is only 12x12x6.8mm^3 in size, a reduction of more than 50 per cent from the conventional approaches. To our knowledge, this is the only solution available for mobile phone.

Another important ACCM-related development is the lens-on-chip camera module which adopts a novel optical process, namely low-temperature ultra-precision molding technology, to make the imaging lens. We can now make a camera module with a size of 2.5x2.5x2mm^3 for 300,000 pixels resolution. The footprint of the camera module is exactly the same as that of the imaging sensor. It has achieved the theoretical size limit of a camera module.

Optical anti-shaking compact camera module.
光學防抖微型相機模塊。

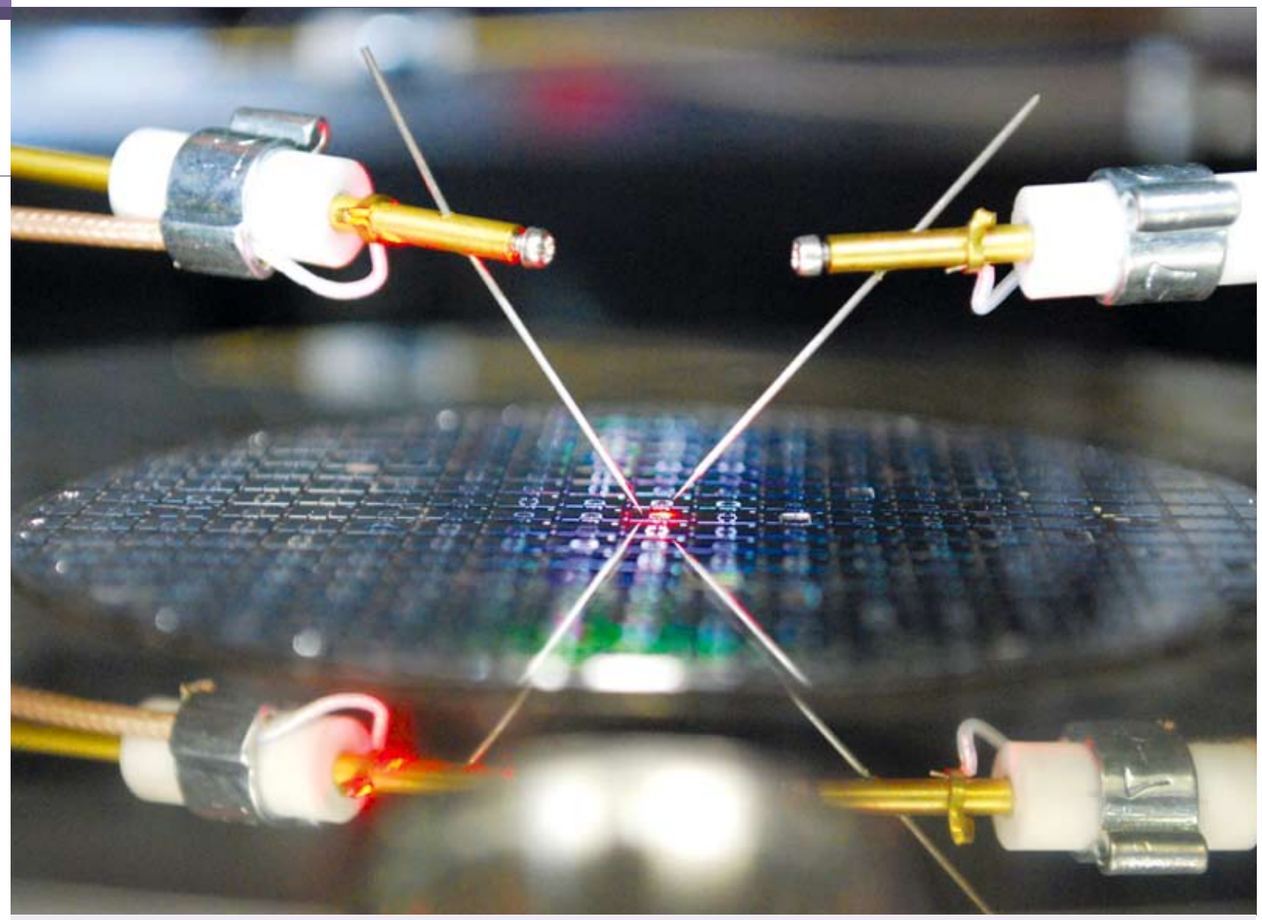
Engineer conducting an anti-shaking experiment.
工程師正進行防抖實驗。

光電子元件組

本年度，光電子元件組共申請了七項針對有關微型攝像機創新技術的美國發明專利，同時也與業界簽訂了三份新合同，持續進行技術授權。由二零零五年成立至今，該組共申請了二十二項美國發明專利，與業界簽訂的技術授權合同累積至七份。該組目前主要為手機和便攜式多媒體產品開發新一代先進微型攝像機模塊技術（ACCM）。

為了進一步提高手機的攝像品質，光電子元件組開發了光學防抖動技術，根據曝光時手的抖動或其他意外震動情況來控制成像透鏡的運轉，以消除震動所引起的圖像模糊，此技術的主要特點在於體積特小的音圈馬達（VCM）。全賴這設計獨特的音圈馬達，該光學防抖動和自動對焦相機模塊體積只有12x12x6.8mm^3，跟使用一般光學防抖動技術的模塊比較，體積減少百分之五十以上，是目前已知最小的體積及唯一能放進手機裏的光學防抖動和自動對焦相機模塊。

另外一個重要的ACCM技術開發是晶圓級攝像模塊。這種模塊採用一種新穎的低溫超精密模造技術來製造成像透鏡。利用這種技術，目前可以製造體積為2.5x2.5x2mm^{3}的三十萬像素的相機模塊。這種相機模塊的面積就只有圖像感應器（CMOS sensor）的大小，並已達到理論值的極限。



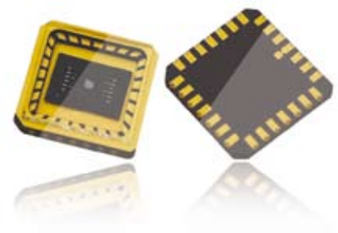
Scanning mirror device wafer.
微掃描鏡晶圓片。

Micro-Systems (MS) Programme

The MS Programme is the youngest key technology initiative in MPT. Its objective is to provide a technical platform allowing integration of microelectronics, micro-optics and micro-mechanical devices for advanced consumer and industrial applications such as Pico-Projector, touch-screen sensing, head-up display, head-mount display, inkjet printing, printed electronics and digital fabrication. Selective MOEMS (Micro-Opto-Electro-Mechanical System) and MEMS (Micro-Electro-Mechanical System) materials and fabrication technologies are among the key focuses of the MS Programme's near-term developments.

微系統組

微系統組是材料與構裝技術群組內一個嶄新的重點科技項目。其發展目標為建立一技術平台，以支援微電子、微光學及微機械不同元件的微製作整合，並將整合後的裝置應用於高階消費電子產品及工業製造技術，其範疇包括：微型投影機、觸控式螢幕感應器、平視顯示器、頭戴式顯示器、噴墨及電子電路打印技術及數碼製作技術等等。短期內該組會將研發焦點集中在微光機電（MOEMS）及微機電系統（MEMS）的材料及製作技術上。



MEMS bi-axial scanning mirror in a chip carrier.
構裝後的微機電二維掃描鏡片。

Achievements
成果

During the year, MPT made remarkable achievements in terms of filed patents, awards and industry contracts.

Innovations and Breakthroughs

MPT filed 33 patent applications in the United States this year. The chart below shows that the total number of filed patents has increased significantly over the last few years.

Awards

The remarkable technologies developed by MPT have won the following awards and accolade:

- The Pico-Projector powered by LEDs won the Product Innovation Award in the 2nd China SSL Innovation Contest (2008);
- MPT's LED technologies were reported with a picture of the vertical LED chip posted on the cover of IEEE Laser & Electro-Optics Society Newsletter in 2008;
- Best Paper Award in International Conference of Electronic Packaging Technologies (ICEPT) in 2008, which is the largest packaging-related conference on the Mainland; and
- Outstanding Poster Paper Award in International Display Workshop (IDW 2008) in Japan, for ASTRI's power-saving LCD using adaptive LED backlight local-dimming technology.

Industry Support

MPT's outstanding innovations and breakthroughs attracted keen support from industry. During the year, MPT signed 20 contracts with industry partners generating more than $14 million in industry contributions, 93 per cent of the contributions came from Hong Kong and Mainland based companies. The yearly accumulated number of signed contracts and cumulative committed industry contributions are shown in the charts below.

本年度，群組在發明專利申請、國際獎項及企業支持方面都取得顯著成果。

創新與突破

材料與構裝技術群組於二零零八年度，共申請了三十三項美國發明專利。如下圖所顯示，過去數年，群組申請美國發明專利的數目不斷增加。

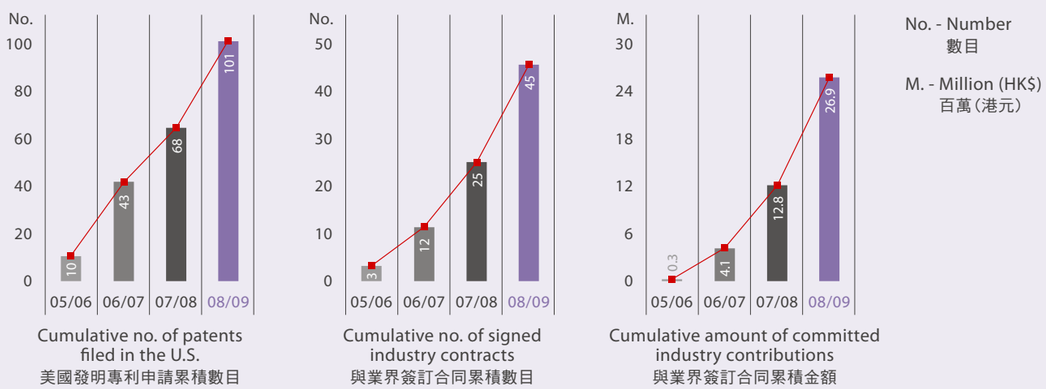
獎項與表揚

材料與構裝技術群組所發明的技術於本年度獲得多項國際獎項及表揚：

- 發光二極體組設計的微型投影機於二零零八年第二屆中國半導體照明競賽中，獲得「創新產品獎」；
- 二零零八年發光二極體技術獲電機及電子工程師學會《鐳射及電子光學協會通訊》報導，該期通訊更以群組開發的垂直結構功率LED晶片為封面圖片；
- 在二零零八年中國電子封裝技術國際會議—中國最大的電子構裝技術會議上獲得「最佳論文獎」；
- 發光二極體組的基於自適應性全屏動態背光的液晶顯示節能技術獲日本二零零八年國際顯示器會議「傑出展示論文獎」。

企業的支持

材料與構裝技術群組的創新與突破成績驕人，得到了企業熱烈支持。本年度材料與構裝技術群組與企業夥伴簽訂了二十份合同，企業投入資金合計超過一千四百萬元，當中百分之九十三的企業投資是來自香港及內地的公司。下圖顯示材料與構裝技術群組與企業夥伴簽訂合同累積數目及合同的累積金額。



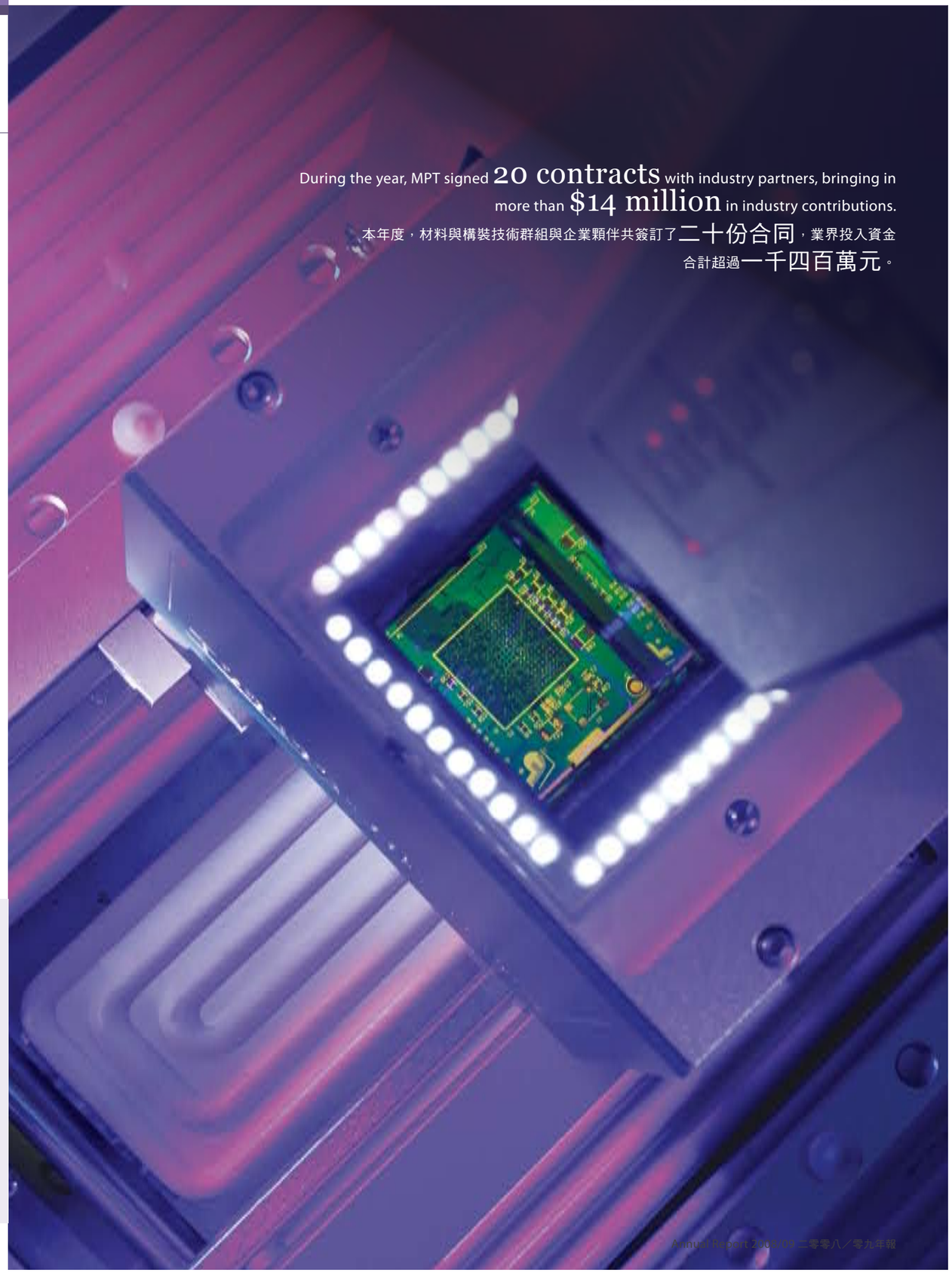
Cumulative no. of patents filed in the U.S.
美國發明專利申請累積數目

Cumulative no. of signed industry contracts
與業界簽訂合同累積數目

Cumulative amount of committed industry contributions
與業界簽訂合同累積金額

No. - Number
數目

M. - Million (HK$)
百萬（港元）

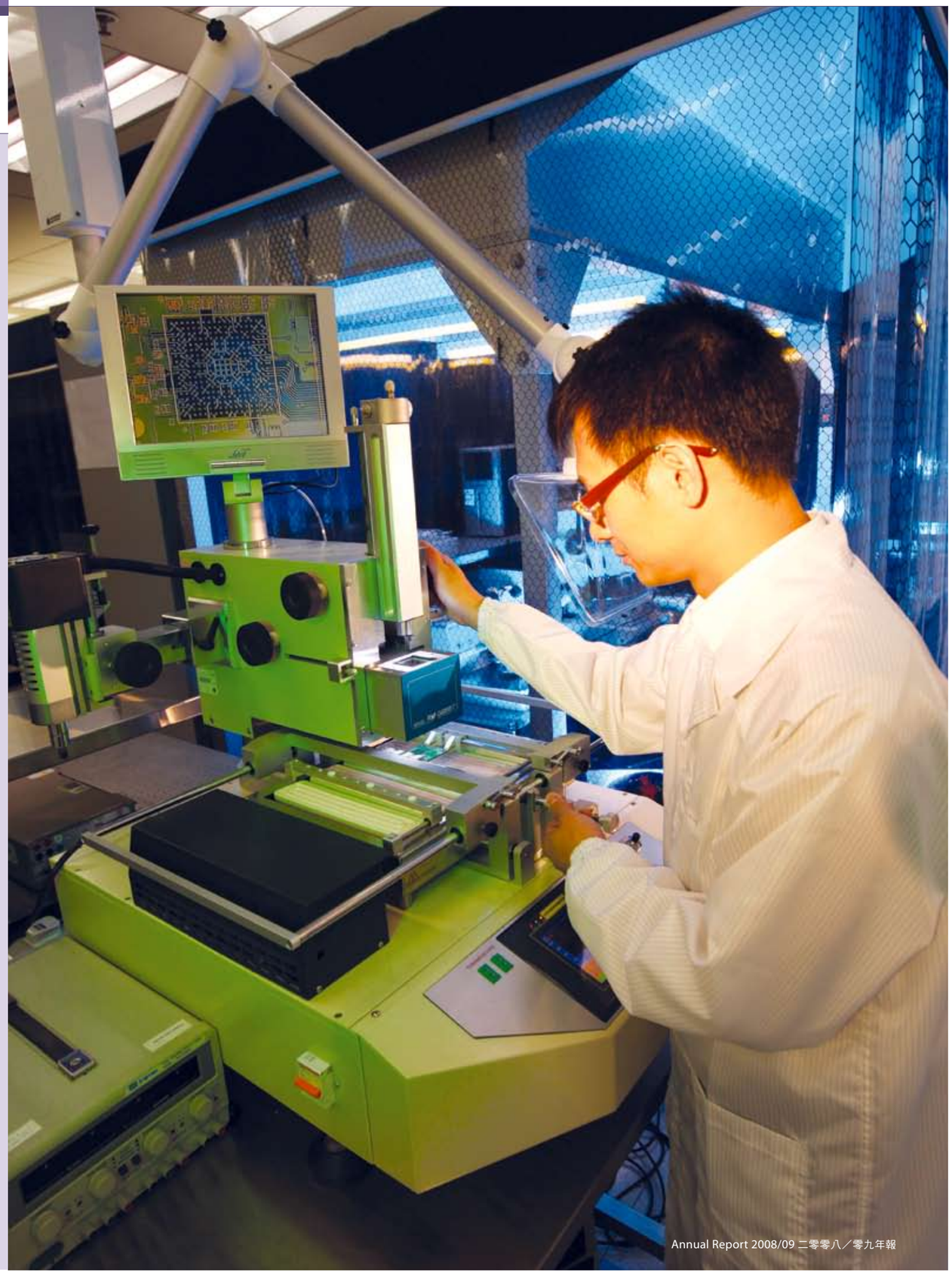


Project Highlights
重點研發項目

Industry Collaborative Project 業界合作項目 Full Project 正式項目 Seed Project 種子項目

	Project 項目	Description 內容	Date 日期
LED Programme 發光二極體組			
1	High-power LED-based MR16 Spotlight 高功率LED MR16射燈	This spotlight incorporating two ASTRI IPs solves heat-spreading and dissipation-related problems. This LED lamp is able to produce more lumen output for brighter light and were licensed to a Hong Kong company for mass production. 此高功率LED MR16射燈包含兩項應科院研發出來的知識產權，主要解決燈體的導熱及散熱問題。它可注入較高的功率以增加光輸出。此技術已授權予香港一家燈源製造商大量生產。	Sep 2006 ~ Sep 2008 二零零六年九月至二零零八年九月
2	Thin-film-based Vertical-LED Chips 垂直結構發光二極體晶片	This novel and patented vertical-LED technology were licensed to two major LED chip makers in the Greater China region. More than 10 U.S. patents have been filed and more than $2 million in industry contributions have been secured. 此簇新而專利的高效能垂直結構發光二極體晶片設計及製作技術，已授權予兩家大中華區主要光電晶片製造公司使用，並已申請十餘項美國發明專利，業界投入資金超過二百萬元。	Mar 2007 ~ Jul 2009 二零零七年三月至二零零九年七月
3	Ultra Thin LED Backlight for LCD TV 應用於大尺寸液晶電視的超薄型LED背光	With a proprietary design of secondary optical components, the light mixing distance of LED backlight can be reduced to 15-25mm. This backlight technology is mainly for the slim LCD TV market. These components can be applied from middle to high power, white or colour LEDs. The LCD TV with this type of backlight presents a more vivid colour and brighter image. 利用應科院獨特的二次光學元件設計，LED背光的混光距離可減少至15-25mm。此背光技術主要用於超薄型大尺寸液晶電視市場。光學元件設計可應用於中功率至大功率、白色或彩色的LED。液晶電視的色域將會更廣，畫面更亮麗。	Jun 2007 ~ Nov 2008 二零零七年六月至二零零八年十一月
4	High Dynamic Range (HDR) LCD Display Technology 高動態範圍液晶顯示技術	HDR is one of the key next-generation display technologies. The HDR-LCD display technology is developed on the foundation of the Active Dynamic LED Backlight platform. More than 10 U.S. patents have been filed and the technology has been licensed to four tier-1 companies in Hong Kong and the Mainland. More than $3.8 million in industry contributions were received. 高動態範圍液晶顯示是新一代顯示技術的重點。應科院以「主動式動態LED背光」為平台，進一步開發了高動態範圍液晶顯示。此技術已申請美國發明專利十餘項，技術授權四家香港及內地一級廠商，並取得業界投入資金超過三百八十萬元。	Jun 2007 ~ Nov 2008 二零零七年六月至二零零八年十一月
5	Pico-Projector 微型投影機	For portable electronics embedded with projection function, ASTRI has successfully developed 9cc module using field sequential type Liquid Crystal on Silicon (LCoS) and 6cc module by colour filter type LCoS. This technology won the "Innovation Product Award" in the 2nd China National Solid State Lighting Innovation Contest (2008). 在可攜式電子產品中加入投影功能方面，應科院成功開發出採用場序式LCoS之9cc大小投影模塊和採用濾光片式LCoS之6cc大小投影模塊。此技術於「第二屆國家半導體照明產品及應用創新大賽」中，獲得「產品創新獎」的殊榮。	Dec 2007 ~ Jul 2010 二零零七年十二月至二零一零年七月
Advanced Packaging Technologies Programme 先進構裝技術組			
6	Cost-effective and Reliable Packaging Solutions for Automotive Electronics 具經濟效益及可靠的汽車電子構裝技術平台	This project provides a total solution to automotive electronics-related industries. Tyre Pressure Monitoring System (TPMS) is used as a product vehicle for demonstrating distinctive advantages based on the above technologies for timely, cost-effective and reliable product implementation. Several U.S. patents have been filed and more than $5 million in industry contributions have been secured. 此項目建立了關鍵的技術平台來提供全方位解決方案，以支援汽車電子業界的產品開發。該組以胎壓監測系統作為示範來展示此技術平台所能提供的及時、具經濟效益和高可靠性等獨特優勢。此技術已申請多項美國發明專利，業界投入資金超過五百萬元。	Mar 2007 ~ Jul 2010 二零零七年三月至二零一零年七月
7	Design Advisor for Virtual Manufacturing and Qualification Testing of 3D Packages 用於對三維堆疊構裝進行虛擬製造和品質認證的設計顧問軟件	This design advisor is mainly for developing 3D packages, with which the entire manufacturing process and qualification tests can be accurately modelled. The manufacturability and reliability related problems can be predicted in advance. Furthermore, the root causes of the problems can be detected by the model followed by constructive recommendations. Several U.S. patents have been filed and more than $1.5 million in industry contributions have been secured. 此設計顧問軟件主要用於三維構裝，它可以幫助構裝設計進行虛擬的製造以及品質認證測試，並用電腦演示潛在的製造和可靠性問題；更為重要的是，它還可以幫助用家指出構裝設計中的問題所在及相應的解決方案。此技術已申請數項美國發明專利，企業投入資金超過一百五十萬元。	Jan 2008 ~ Mar 2010 二零零八年一月至二零一零年三月

	Project 項目	Description 內容	Date 日期
8	Cost-effective and Reliable Energy Harvesting (EH) Solutions for Portable Electronic Products	This technology platform provides timely, cost-effective and reliable energy harvesting-related solutions, particularly for portable electronics. The key technologies are energy harvester(s) and energy storage. Product-oriented system development including hardware and software applicable for electronic products, such as consumer, healthcare and automotive electronics.	Mar 2009 ~ Mar 2011
	具經濟效益及可靠的能量採集方案以供可攜式電子產品應用	此技術平台提供及時、具經濟效益及可靠的能量採集方案，為可攜式電子有關產品應用。技術包括能量採集器設計、能量儲存電路設計及產品導向的系統開發，包括軟、硬體開發，適用於電子產品應用，如消費性電子、醫療電子及汽車電子。	二零零九年三月至二零一一年三月
	Photonic Components Programme 光電子元件組		
9	Anti-shaking Compact Camera Module (CCM) for Cell Phone	ASTRI has developed an optical anti-shaking and auto-focus compact camera module of 12x12x6.8mm^3 for next-generation camera phone applications. This technology allows users to take clear photos or stable videos even under a shaky condition or in a moving car or train, and has obtained developmental support from several companies including a tier-1 company. Five U.S. patents have been filed.	May 2007 ~ Sep 2009
	適用於手機的防抖動微型相機模塊	應科院已開發新型的光學防抖動及自動對焦微型相機模塊技術，其體積只有12x12x6.8mm^3，可應用於新一代的照相手機。這種技術讓用者可以在震動或抖動的情況下，比如在行走的汽車或火車上，拍攝出清晰的照片或穩定的錄像。這個技術已成功獲得數家一級手機零件大廠的開發支持，並已申請五項美國發明專利。	二零零七年五月至二零零九年九月
	Micro-Systems Programme 微系統組		
10	MOEMS Scanning Mirror and Laser Scanning Projection Display	Micro scanning mirror fabricated using MEMS technologies is the key component of emerging low-cost and compact light engines useful for numerous MOEMS applications. ASTRI has developed a bi-axial MOEMS scanning mirror and the corresponding system for laser scanning projection display. The integrated compact module was successfully applied in a movie demonstration.	Dec 2008 ~ Dec 2010
	微光機電（MOEMS）掃描鏡和鐳射掃描投影顯示器	微型掃描鏡是新一代價廉、體積小、重量輕的光學引擎的核心裝置，此光學引擎可被應用於許多微光機電產品。現階段，應科院已成功研製出雙軸微光機電掃描鏡，及對應的鐳射掃描投影系統。整合後的微型模塊已能成功應用於影片示範。	二零零八年十二月至二零一零年十二月



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

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

Review
回顧

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 $500 million pledged donation from The Hong Kong Jockey Club Charities Trust for researching and developing Chinese medicine (CM).

Under the strategy of innovation and technology development, HKJCICM pursues a public mission spearheading value-added development of CM and the industry through science, quality, evidence and application.

HKJCICM's development strategies in
- advancing quality control and standardization of CM,
- championing CM and herbal product innovations, and
- providing sector-relevant information and exchange,

are geared for HKJCICM to connect with the CM sector and achieve added value.

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，為香港應用科技研究院的附屬機構。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元，支持中藥科研和發展計劃。

在創新科技策略的支持下，研究院的使命為透過科研、質控、臨床循證及應用，將中藥業發展成為香港的高增值行業。

在發展策略方面，研究院繼續保持與中藥業界的緊密合作，致力
- 提升中藥品質控制及標準化；
- 推動創新中藥及天然產品的研發；及
- 發放業界相關資訊、促進相互交流。

Achievements
成果

Encyclopedia of contemporary medicinal plants.
當代藥用植物典。

Through governance, projects, partnerships and exchanges, HKJCICM has gained experience and made achievements, listed below are some examples.
- Advanced the science and evidence base of CM through scientific research and publications; initiated three projects and published 23 publications during the year.
- Established a central CM Laboratory concerning technical competency and productivity in authentication, plant chemistry, analytical development and quality control supporting funded projects and industry initiatives, as well as providing technical services, research tools and information for better quality control and standardization of CM.
- R&D and production of chemical markers which are accepted by the Chinese Medicine Council of Hong Kong for testing purposes to support product registration. About 130 markers were on sale up to early 2009, with each marker accompanied by a certificate of analysis involving purity (for example 95 per cent or 98 per cent).
- Approval from China's State Food and Drug Administration regarding two CM-based products for entering clinical trials:
  (a) A granule based on a CM formula for relieving menopausal syndrome (jointly developed by the Chinese University of Hong Kong in partnership with the Shanghai Innovative Research Centre of TCM);
  (b) A CM formulation with enhanced bio-availability that relieves cardiovascular disease (developed in conjunction with the Hong Kong Polytechnic University).

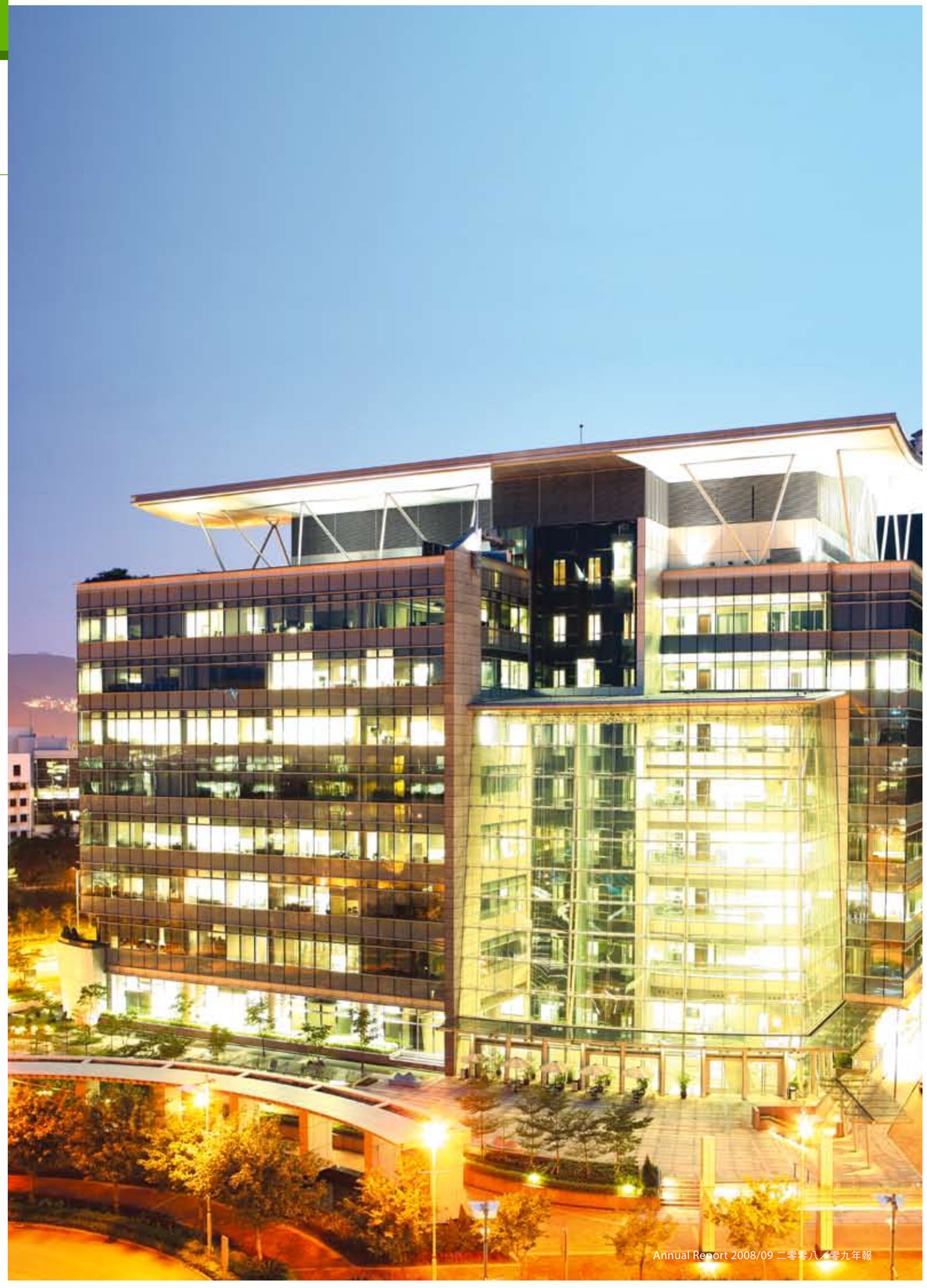
在各方的支持下，研究院在統籌協調、項目管理、合作及交流等方面，都取得了令人鼓舞的進展和寶貴的經驗，以下是一些例子。
- 透過科學研究及出版刊物，強化中藥的科學及循證研究；本年度共開展了三個新研究項目，同時發表了二十三篇學術論文。
- 建立具研究實力及生產力的中藥研究室，提供中藥材鑒定、質量分析和檢測方法、以支持研究院推動之項目及配合業界發展需要；中藥研究室提供的技術服務還包括研究工具及資訊，以加強質量控製及中藥標準化。
- 研究及生產化學對照品，以支持產品進行註冊。直至二零零九年初為止，已有約一百三十個對照品可供銷售，每個均附有列明純度（如百分之九十五或百分之九十八）等資料的分析證書，而有關對照品已獲香港中醫藥管理委員會中藥組接納用作藥品測試。
- 兩種新中藥已獲中國國家食品藥品監督管理局批准進行臨床研究，分別用於：
  (a) 舒緩婦女更年期症狀（與香港中文大學及上海中藥創新研究中心合作）；及
  (b) 心血管病（與香港理工大學合作），標誌著香港中藥應用研究方面的重要里程碑。

Chinese medicine chemical markers.
中藥化學對照品。

- A showcase on integrative Chinese and Western medicine research on Irritable Bowel Syndrome: a drug product in pre-clinical development.
- A central business development platform to facilitate technology transfer and commercialization.
- A "Chinese Medicine Hong Kong" information and exchange platform, including e-news portal, market research, publications, forums and exhibitions; a Market Research Report on Chinese Medicines and Health Products in China (2008) published in partnership with HKTDC.
- The simplified Chinese version of the Encyclopedia on Contemporary Medicinal Plants, a four-volume publication of HKJCICM in partnership with Hong Kong Baptist University and CM experts, was awarded the China Outstanding Imported Science Book Prize (Technology), being the only local winner in that category in 2008.
- Five public lectures were organized to connect with industry, as well as to disseminate R&D updates and explore new project ideas. In November 2008, HKJCICM and Hong Kong Science and Technology Parks Corporation organised the inaugural forum of the SPARC (Science Park from Applied Research to Commercialization) series on "Chinese Medicine and Herbal Products". HKJCICM also supported major events organised by government agencies and non-governmental organisations within and outside Hong Kong.

- 研製治療腸易激綜合症藥物，作為結合中西醫學研發試點，該藥物已進入臨床前研究階段。
- 設立業務發展平台，推動技術轉讓及研發成果商業化。
- 設立名為「中藥香港」的資訊及交流平台，涵蓋新聞、市場研究、刊物、論壇及展覽等方面的資訊，並與香港貿易發展局聯合編纂《內地中成藥及保健食品市場研究報告》，於二零零八年中出版。
- 由香港賽馬會中藥研究院與香港浸會大學及中藥專家合作編纂、一套四冊的《當代藥用植物典》（簡體中文版）榮獲二零零八年中國引進版優秀圖書獎（科技類），是唯一在該類別獲獎的香港圖書。
- 舉辦了五個公開講座與論壇，以加強業界聯繫，分享研發新知及發掘新項目意念；於二零零八年十一月與香港科技園公司聯合主辦首屆科學園應用研究商業化論壇—中藥及草本產品；除此之外，研究院亦積極參與由政府機構及非政府組織在香港及海外舉辦的各項主要活動。

SPARC Forum 2008 – Chinese medicine and herbal products.
二零零八年科學園應用研究商業化論壇 – 中藥及草本產品。



Finance
財務報告

During 2008/09, ASTRI continued to be prudent in its financial management.

In brief, the income and expenditure for the year amounted to HK$383,055,604 and HK$364,554,548 respectively, resulting in a surplus of HK$18,501,056.

During the year, ASTRI received HK$121,386,000 from recurrent subvention (RS), HK$211,378,033 project funding from Innovation and Technology Fund (ITF) and HK$163,061 from ITF internship fund. The industry contribution directly attributable to R&D projects increased from HK$10,697,850 in 2007/08 to HK$27,217,833 in 2008/09. Meanwhile, the net contract services income received from the industry also increased from HK$388,284 in 2007/08 to HK$1,528,753 in 2008/09 (the contract services income is net of related expenses, HK$2,677,863 in 2007/08 and HK$10,521,576 in 2008/09).

The total expenditure of RS amounted to HK$100,106,394, comprising:
(a) HK$62,899,721 in respect of salaries and related benefits;
(b) HK$14,345,105 in respect of office rental and related building management fees;
(c) HK$22,861,568 in respect of professional fees and other operating expenses.

The total expenditure of the R&D projects amounted to HK$237,795,866, which represented the actual cash outflow incurred during the year for 60 full projects and 51 seed projects. Meanwhile, the internship expenditure amounted to HK$163,061, which represented the actual cash outflow of salary payments for interns engaged in four full projects.

During the year, ASTRI returned HK$13,229 to the Government, the amount represented the sales of sample and royalty income generated from earlier completed projects. An additional amount of HK$504,682, which represented the amount of bank interest income generated from completed ITF projects, was returned to the Government upon the completion of project audit.

The consolidated accounts for the year ended 31 March 2009 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 an extract of the consolidated income and expenditure account and consolidated balance sheet were set out on the following pages.

應科院在二零零八／零九年度，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383,055,604元及港幣364,554,548元，盈餘達港幣18,501,056元。

年度內，應科院收到經常性撥款港幣121,386,000元，來自創新及科技基金的研發經費港幣211,378,033元，及來自創新及科技基金的實習研究員計劃資助港幣163,061元。業界直接投入研發項目的資金由二零零七／零八年港幣10,697,850元增加至二零零八／零九年港幣27,217,833元。同時，從業界所得的合約服務淨收入由二零零七／零八年港幣388,284元增加至二零零八／零九年港幣1,528,753元。（合約服務收入已扣除了相關開支，二零零七／零八年的開支是港幣2,677,863元及二零零八／零九年港幣10,521,576元。）

經常性撥款的總支出達港幣100,106,394元，包括：
(a) 港幣62,899,721元薪酬及有關福利的支出；
(b) 港幣14,345,105元辦公室租金及有關辦公室管理費的支出；
(c) 港幣22,861,568元有關專業服務費及營運方面的支出。

研發項目的總開支達港幣237,795,866元，相當於六十個正式項目和五十一個種子項目的實際流出現金支出。同時，實習研究員計劃開支達港幣163,061元，相當於從事四個正式項目的實習員薪酬的實際流出現金。

年度內，應科院退還港幣13,229元給政府，此金額是從早期完成項目所得的樣品出售和版稅收入。另有港幣504,682元，是從完成了的創新及科技基金項目所得的銀行利息收入，在完成項目審計後已退還給政府。

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）有限公司全年截至二零零九年三月三十一日止的綜合賬目經由外部核數師審計，並獲發無保留審計意見書。綜合收支表及綜合資產負債表詳載後頁。

Consolidated Income and Expenditure Account
綜合收支表

(For the year ended 31 March, 2009 截至二零零九年三月三十一日止年度)

		2009 (HK$) 二零零九年(港幣)	2008 (HK$) 二零零八年(港幣)
Subvention	**資助**		
Income from Government subvention	政府資助收入	121,386,000	119,907,000
Administrative expenses	行政支出	(100,106,394)	(114,260,207)
Surplus on subvention	資助盈餘	21,279,606	5,646,793
Project Funding from Innovation and Technology Fund and Industry Contribution	**創新及科技基金及業界項目資金**		
Project fund income	項目收入		
Innovation and Technology Fund	創新及科技基金	211,378,033	157,622,477
Industry contribution	業界項目資金	27,217,833	10,697,850
Project expenditure	項目支出	(237,795,866)	(169,120,327)
Balance on project funding	項目資金餘額	800,000	(800,000)
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	163,061	-
Internship expenditure	實習研究員計劃支出	(163,061)	-
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	10,528,265	14,015,748
Project expenditure	項目支出	(10,528,265)	(14,015,748)
Balance on project funding	項目資助餘額	-	-
Other Income	**其他收入**	1,860,836	665,595
Amount Refund to the Government of Hong Kong Special Administrative Region	**退還香港特別行政區政府款項**	(13,229)	(518,087)
Surplus Before Taxation	**稅前盈餘**	23,927,213	4,994,301
Taxation	**稅項**	(5,426,157)	(2,723,291)
Surplus For The Year	**本年度盈餘**	18,501,056	2,271,010
Attributable to	**分配於**		
Equity holders of the Company	本公司股權持有人權益	18,468,842	2,271,010
Minority interests	少數股東權益	32,214	-
		18,501,056	2,271,010

Consolidated Balance Sheet
綜合資產負債表

(At 31 March, 2009 於二零零九年三月三十一日)

		2009 (HK$) 二零零九年(港幣)	2008 (HK$) 二零零八年(港幣)
Non-current Asset	**非流動資產**		
Property, plant and equipment	物業、機器及設備	8,793,273	8,049,249
Current Assets	**流動資產**		
Accounts and other receivables	賬戶及其他應收款項	6,613,347	99,072
Bank balances and cash	銀行結餘及現金	212,457,114	120,480,326
		219,070,461	120,579,398
Current Liabilities	**流動負債**		
Accounts and other payables	賬戶及其他應付款項	22,518,800	3,994,398
Receipts in advance	預收款項	128,394,631	68,971,648
Amount due to the Government of Hong Kong Special Administrative Region	香港特別行政區政府到期款項	180,013	541,345
Amount due to The Hong Kong Jockey Club	香港賽馬會到期款項	2,184,485	1,892,791
Tax payables	應付稅項	2,094,579	678,535
		155,372,508	76,078,717
Net Current Assets	**流動資產淨值**	63,697,953	44,500,681
Total Assets Less Current Liabilities	**總資產減流動負債**	72,491,226	52,549,930
Non-current Liabilities	**非流動負債**		
Deferred tax liabilities	遞延稅項負債	1,440,260	-
		71,050,966	52,549,930
Capital and Reserves	**股本及儲備**		
Share capital	股本	2	2
Accumulated surplus	累計盈餘	71,018,769	52,549,927
Translation reserve	折算儲備	(20)	-
Equity Attributable to Equity Holders of the Company	**本公司股權持有人應佔權益**	71,018,751	52,549,929
Minority Interests	**少數股東權益**	32,215	1
		71,050,966	52,549,930

A Year in Capsule
大事紀要

(1 April, 2008 - 31 March, 2009 二零零八年四月一日至二零零九年三月三十一日)

15.04.2008
ASTRI took the lead in establishing WiMAX & DTV Industry Consortium with the Federation of Hong Kong Industries, Hong Kong Electronic Industries Association, Hong Kong Wireless Technology Industry Association and Hong Kong Productivity Council to bring new business partners together and exchange information on the latest technological developments.
應科院牽頭與香港工業總會、香港電子業商會、無線科技商會及香港生產力促進局組成「WiMAX & DTV 產業聯盟」，共同與合作夥伴交流最新的科技發展資訊。

20.05.2008
Visitors from the Chinese Ministry of Science and Technology, Hong Kong and Macau Affairs Office of the State Council, and China Science and Technology Exchange Centre visited ASTRI.
中國科技部聯同國務院港澳辦及中國科學技術交流中心到訪應科院。

27.05.2008
Guests from the Institute of Electrical and Electronic Engineers (IEEE) were warmly received by the Communications Technologies Group. A conference was held at ASTRI with R&D Directors during the visit.
國際電機及電子工程師學會（IEEE）訪問團來訪，獲通訊技術群組接待，期間與多位研發總監進行交流會議。

30.07.2008
To extend networking with trade organisations, ASTRI invited representatives of Chinese Manufacturers' Association of Hong Kong for a visit. Mr. Eddy Chan (left), Commissioner for Innovation and Technology, hosted a special reception for the delegation.
為加強與商會之間的聯繫，應科院邀請了香港中華廠商會到訪本院，創新科技署署長陳育德先生（左）特別設宴款待。

31.07.2008
ASTRI, Hong Kong Science & Technology Parks and Television Broadcasts Limited together launched Hong Kong Interactive TV Platform. ASTRI played a key role in defining and enhancing the unique standard of "Hong Kong Profile" to facilitate the development of interactive TV services.
應科院、香港科技園及香港電視廣播有限公司成功啟動香港互動電視平台。應科院在制定及加強「香港互動電視規格」的統一標準，以推動互動電視服務發展的工作上，擔當重要角色。

04.08.2008
Enterprise & Consumer Electronics Group's iShare P2P Software was adopted by i-Cable to telecast live major events on a special website during the Beijing Olympics. This P2P software ensured a stable and smooth transmission even when massive viewers were tuning in simultaneously.
企業與消費電子群組的iShare P2P媒體分發技術，獲有線電視採用於北京奧運比賽的網上直播。此技術確保在眾多觀眾同步收看時，畫面保持穩定及流暢。

17.09.2008
ASTRI and Time Medical announced the breakthrough collaboration on producing a small size, high quality Magnetic Resonance Imaging (MRI) machine at low cost. Low cost was a key factor in accessing the Mainland market, especially for rural and city hospitals.
應科院及美時醫療宣佈聯手合作研發成本低、體積小及影像質素高的磁共振儀。此產品成本低廉，對中國內地的鄉鎮醫院尤其適合。

18.09.2008
Professor Clayton Christensen from Harvard Business School enlightened more than 200 ASTRI staff at the forum on "Disruptive Technology".
美國哈佛大學商學院Clayton Christensen教授主講的「突破性科技」論壇，吸引二百多名應科院員工出席。

3.10.2008 & 31.10.2008
ASTRI held its annual "Industry and University Technology Consultation Forum" in Hong Kong and Shenzhen respectively, introducing its wide range of technology programmes and R&D endeavours to a total of nearly 700 participants. The forums received strong support from the Innovation and Technology Commission of HKSAR, Shenzhen Bureau of Science Technology & Information, Shenzhen High-Tech Industrial Park, Shenzhen International Science and Technology Business Platform, and Productivity (Shenzhen) Consulting Co. Ltd.
應科院分別在香港及深圳主辦「業界及學界科技論壇」，向總數近七百名的來賓介紹應科院各項科研項目及研發成果。論壇獲得粵港政府部門大力支持，包括香港特別行政區政府創新科技署、深圳市科技和信息局、深圳高新區、深圳國際科技商務平台及深港生產力基地。

A Year in Capsule
大事紀要

(1 April, 2008 - 31 March, 2009 二零零八年四月一日至二零零九年三月三十一日)

12.10.2008-17.10.2008
ASTRI exhibited its prototypes and technologies at the 10th China Hi-Tech Fair. Chief Technology Officer Dr. Manuel Costa (left) signed an MOU with Peking University Shenzhen Graduate School on the establishment of the Advanced Digital Signal Processing Research Laboratory.
應科院在第十屆「中國國際高新技術成果交易會」展示最新技術。首席科技總監郭文偉博士（左）代表應科院與北京大學深圳研究生院簽署成立先進數字訊號處理實驗室備忘錄。

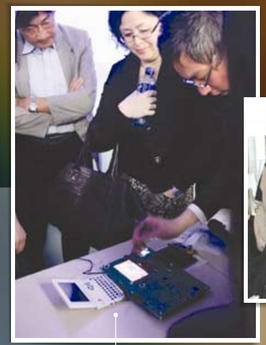
05.11.2008
A delegation led by Mr. Chen Xin (second left), Deputy Director-General of Guangdong Science and Technology Department visited ASTRI to foster collaboration between Guangdong and Hong Kong.
應科院接待由廣東省科技廳副廳長陳新先生（左二）率領的代表團，促進粵港科技交流。

1.12.2008
Chief Executive Officer Dr. Cheung Nim-kwan assumed office.
行政總裁張念坤博士正式履新。

11.12.2008
Minister Wan Gang (middle) led a delegation from the Chinese Ministry of Science and Technology to visit ASTRI. They were warmly received by the Board Chairman Dr. Patrick Wang (left) and the Chief Executive Officer Dr. Cheung Nim-kwan (right).
萬鋼部長（中）率領中國科技部代表團到訪應科院，由董事局主席汪穗中博士（左）及行政總裁張念坤博士（右）接待。

16.12.2008
ASTRI Science and Technology Research (Shenzhen) Co. Ltd, a wholly-owned subsidiary of ASTRI, was inaugurated in Shenzhen to further facilitate the collaboration and mutual exchanges with the local Government and clients and partners in the Pearl River Delta.
應科院的全資附屬公司「應科院科技研究（深圳）有限公司」正式於深圳成立，以加強與珠三角地方政府的聯繫，並促進客戶和業界的合作交流。

06.01.2009
The Permanent Secretary for Commerce and Economic Development Mr. Duncan Pescod (right) accompanied by the Deputy Commissioner for Innovation & Technology Mr. Gordon Leung tried out ASTRI's home-developed Magnetic Resonance Imaging (MRI) machine during a visit.
商務及經濟發展局常任秘書長栢志高先生（右）由創新科技署副署長梁松泰先生陪同到訪應科院，並親身體驗應科院所研發的磁共振儀的功效。



16.02.2009-19.02.2009
The Communications Technologies Group showcased its 3GPP TD-LTE technology with its partners including PicoChip, Innofidei, Agilent and Rohde & Schwarz, at the Mobile World Congress 2009 in Barcelona, Spain.
通訊技術群組參與二零零九年於西班牙巴塞隆拿舉行的世界移動通訊大會，聯同合作夥伴PicoChip、創毅視訊、安捷倫科技和羅德史瓦茲展示3GPP TD-LTE技術。

23.02.2009
The Enterprise & Consumer Electronics Group collaborated with myIT-School, an associate body of HKUST R&D Corporation Ltd, to develop an e-book for education purposes. A briefing session was held to explain to parents and teachers how ASTRI applied Peer-to-Peer technology and mobile Internet device on e-learning.
企業與消費電子群組與香港科技大學研究及開發有限公司屬下之機構myIT-School合作研發教育用途的電子書。在功能介紹及意見交流會上，應科院的研發人員向家長及教師剖析如何運用點對點技術及流動網絡於網上學習。

28.3.2009
ASTRI held its first Career Day to introduce job opportunities to engineering and science graduates from local universities. More than 200 young people participated with enthusiasm.
應科院首次舉辦就業咨詢日，為本地大學的理工科畢業生，介紹應科院提供的就業機會。超過二百人參加是次活動，場面熱鬧。

This Annual Report is published by the authority of the Board of Directors of ASTRI
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