



ANNUAL REPORT





OUR VISION & MISSION

A great global university founded on science and technology, nurturing creative and entrepreneurial leaders through a broad education in diverse disciplines.



“Teamwork,” the winning photo of ConnectNANYANG Photography Competition
by Mr Eric Leong Jia-Le, MAE student

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Ready to take on the world – The Class of 2009, MSE

AT A GLANCE

Our faculty members come from **55** countries

Students from **72** countries study, research and play at NTU

Students from more than **100** institutions across 26 countries come to NTU on exchange programmes

NTU students participate in exchange programmes in more than **100** institutions from 28 countries

Over **2,200** teaching and research staff

Over **9,400** graduate students

More than **21,600** undergraduates

More than **131,400** alumni worldwide

More than **\$74,675,000** from donors

Awarded more than **\$169,600,000** in Competitive Research Grants in FY08



CHAIRMAN'S MESSAGE

NTU has changed dramatically since its Nanyang University origins in the 1950s, and made huge advances since its Nanyang Technological Institute days in the 1980s, when its mission was to train industry-relevant and practice-oriented engineers to power the manufacturing engine of Singapore's economy. We are now a research-intensive university offering a broad-based education in a wide range of disciplines from engineering and the sciences to business and the arts and humanities. Our graduates work in varied fields and together with our research, enrich the knowledge and innovation capital of Singapore. While we have come a long way for a relatively young university, this is only the start of a long journey ahead. But each year brings us closer to our goals. Each year marks a new level of development, a new height scaled. The last academic year is no exception.

Academic Year (AY) 2008/2009 saw the official opening of the avant-garde School of Art, Design and Media building in April 2009. This is symbolic of the substantial progress the University has made in education and research. The intersection of art, design, technology and engineering at the heart of the design School reflects the rich diversity of disciplines in the University, the inroads we have made in interdisciplinary and integrative research, and the multifaceted educational experience on offer to students. In fact, a large and strong Engineering College, and the wealth of collaboration opportunities with other Colleges and Schools have spurred the growth of not only Science but Business, Social Sciences and Humanities as well. These Schools have flourished and built a solid reputation as illustrated by our MBA programme, which was ranked 24th in the world by the Financial Times in January 2009. This is the first time ever that a Singaporean Business School has entered the Top 25 of a prestigious MBA ranking. We are also one of the very few universities in the world, which have both technology and business disciplines in the top rungs of university rankings.

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Our mission is to nurture creative and entrepreneurial leaders through a broad education in diverse disciplines. In producing graduates for the Singapore economy and for the future of Singapore, we train minds, build character and mould individuals. As an institution of learning, we impart knowledge and teach skills, which are relevant to the times and which prepare students well for a lifetime of careers. We provide a conducive environment for scholarship and personal growth and the intellectual and physical space for exploration and discovery. This means constant review and revamp of teaching and learning and challenging traditional tenets of education.

Undergraduate education at NTU is nourished by a vibrant and stimulating research environment. With our growing reputation, NTU has been attracting top-notch faculty and researchers in recent years to spearhead interdisciplinary research projects and chart new frontiers. We have strategic platforms that mobilise and focus intellectual resources from across the University to address research themes of global relevance and impact. We will capitalise on these platforms and existing strengths to build peaks of excellence that will energise and raise the overall quality of research and education in the University, position the University on the emerging "New Silk Road" of ideas and intellectual exchange between East and West, and address some of mankind's most serious challenges.

This is a period of momentous change. The impending establishment of the Singapore University of Technology and Design and the Singapore Institute of Applied Technologies in 2011 will once again alter the higher education dynamics in Singapore. While based in Singapore, NTU operates on the global stage. We compete on a global scale for faculty, students and resources. Outstanding universities, not just those in developed economies but also emerging ones, are ramping up even as those in the lead pull further ahead. We welcome these challenges: we have to keep on raising our bar. To meet these challenges, NTU has already embarked on formulating strategic directions and identifying the peaks of excellence we seek to climb in the next five years. I am confident that NTU, in concert with our stakeholders and united in purpose, will more than hold its own and forge ahead towards becoming a great global university.

MR KOH BOON HWEE

Chairman, Board of Trustees
Nanyang Technological University



Chairman of the NTU Board of Trustees Mr Koh Boon Hwee congratulating Mr Kong Kian Shing, winner of the Lee Kuan Yew Gold Medal and DSO National Laboratories Gold Medal and Cash Award



PRESIDENT'S MESSAGE

Academic Year (AY) 2008/2009 was a year that saw earlier investments in academic excellence bear fruit. It was also a year where new initiatives were launched to position us strongly for the future.

The School of Humanities and Social Sciences graduated its pioneer batch of students in 2008, while the School of Physical and Mathematical Sciences and the School of Art, Design and Media graduated their first batch of students this year. These are the newest Schools of the University set up in 2004 and 2005 respectively, following the recommendations of the Committee to Review the University Sector and Graduate Manpower Planning, chaired by Dr Ng Eng Hen, to restructure NTU into a full-fledged, comprehensive University founded on science and technology. NTU has since broadened its complement of educational offerings, not just to meet the economic needs of the country, but also to cater to the diverse interests of the students. The integration of the three new Schools into the fabric of the University, and the interaction of new disciplines such as social sciences and arts with our established strengths in engineering, have opened up new possibilities. Outcomes of such interaction include the double degree programme in Engineering and Economics and the degree in Sport Science and Management, launched respectively in 2008 and 2009.

For AY2008/2009, we witnessed a record number of applications for undergraduate studies matched by a strong improvement in the intake quality of 'A' level and Polytechnic diploma holders. The new programmes have also attracted overwhelming responses from top students. This is a testimony to the relevance and quality of

undergraduate programmes at NTU. Indeed, the University constantly seeks to enhance the educational experiences of students and strengthen educational standards. It is for this purpose that a Blue Ribbon Commission was recently set up to study all aspects of undergraduate education at NTU. The review builds on the New Undergraduate Experience, an initiative launched in 2003 that emphasises a holistic and comprehensive education to nurture creative and entrepreneurial global leaders. We are now implementing the ambitious and forward-looking recommendations of the Commission.

In the pipeline is a plan for a medical school at NTU. The proposal is now being studied by both NTU and the Ministry of Education. Development of a medical school presents a unique opportunity for the University to make a quantum leap. Not only will the medical school add depth and breadth to our academic base, our existing strengths in Engineering, Science and Business will also be given impetus to find new applications in areas from health management to medical devices to clinical research.

To build capability to drive academic developments on various fronts, NTU has been attracting world-renowned faculty and outstanding researchers over the last few years to our campus. This is evidenced by our success in the National Research Foundation (NRF) Research Fellowship scheme and our Nanyang Assistant Professors scheme. Many promising young faculty from around the world vied and chose to join NTU. Our successes in attracting and developing talent have translated into a dramatic rise in research grants garnered. Competitive research funding secured jumped three-fold from 2005 to 2008 and

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this does not include the award of S\$150 million by the National Research Foundation for our Research Centre of Excellence – the Earth Observatory of Singapore. In particular, in the area of interactive design media, NTU secured the lion's share of the awards granted by the NRF. Strategic research platforms such as the Earth Observatory of Singapore and the Institute for Media Innovation bring together talented academics, scientists and investigators from various corners of the globe to conduct cutting-edge research that often transcends disciplinary boundaries. The latest addition to our stable of strategic research platforms is the Energy Research Institute @ NTU (ERI@N), launched in June 2009.

As we develop our expertise in research and education, we also learn from others and share our experiences through a rich network of alliances to contribute and make an impact in the international arena. We have especially deep and broad ties in China and will leverage our engagement with China to develop the University into a vital knowledge hub between the East and West. In April 2009, seven of the world's top technological universities came together at NTU to form the Global Alliance of Technological Universities. The Alliance aims to leverage science and technology to address global societal issues. Members of the Alliance include the California Institute of Technology and Georgia Institute of Technology in the United States, Imperial College London and Eidgenössische Technische Hochschule Zürich (The Swiss Federal Institute of Technology Zürich) (ETH Zürich) in Europe, and the Indian Institute of Technology Bombay, Shanghai Jiaotong University and NTU in Asia. I am honoured to serve as the inaugural Chair of the Alliance for a two-year term.

Asia's first Kauffman campus, a partnership with the famed Ewing Marion Kauffman Foundation, was also set up at NTU during the academic year, giving a major boost to our efforts in entrepreneurship education. The Kauffman Foundation, based in the United States, is one of the world's largest foundations devoted to entrepreneurship. In partnership with the Kauffman Foundation, NTU plans to

develop an Asian model of innovation and entrepreneurship eco-system. Complementing our innovation initiatives are industrial partnerships. The agreement signed with Sembcorp to jointly explore treatment of complex industrial wastewater and the official opening of Bosch Research and Technology Centre Asia Pacific are recent examples of our active collaboration with the industry.

There is so much happening on campus, and not just in teaching and research. Come August 2010, NTU will hum to a different beat, when it plays host to international athletes and officials of the inaugural Youth Olympic Games as the venue of the Games Village. The much-awaited event promises to be an enriching experience for the NTU community with unique learning and interaction opportunities. Preparations for the Games are in full swing. The Games participants will be housed in upgraded halls of residence and sports and recreational venues. The campus community is being mobilised to help with the planning and to lend support at the event. With all these, current and future generations of students will benefit from the legacy of NTU's hosting of the Youth Olympic Games.

AY2008/2009 has been a fulfilling and exhilarating year for NTU. To steer the University to greater heights, we have embarked on a new round of strategic planning involving key stakeholders of the NTU community. A bold and ambitious strategic plan looking ahead to 2015 is taking shape. Anchoring the strategic plan is our goal to build peaks of excellence in our areas of strength that deal with issues of global concern and relevance to Singapore. We will marshal and synergise the capabilities in all our Colleges and across the University to make substantive contributions and break new ground in these areas. I am confident that in developing these peaks of excellence, we will propel NTU to the forefront of world-class universities.

DR SU GUANING

President

Nanyang Technological University



A great day, a significant moment – The official opening of SPMS

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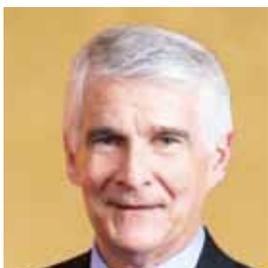
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(Appointed in August 2009)



Dr Su Guanng

President
Nanyang Technological University



Students engaging in a lively discussion at a Mathematical Programming session

EXPANDING HORIZONS

Enriching lives and developing talents through a broad-based education



UNDERGRADUATE EDUCATION

NTU is a strong advocate of a broad-based, quality undergraduate education. We are committed to providing an enriching educational experience for our undergraduates in the hope that they will gain a competitive edge when they enter the workforce and emerge as successful leaders of the future. To this end, the University is constantly evolving and moving forward to realise its undergraduate educational philosophy.

Higher Enrolment, Better Intake

Our undergraduate enrolment is making strong progress in growth and quality. In the last five years, it has grown more than 40% with Academic Year (AY) 2008/2009 receiving a record number of applications coupled with a healthy growth in acceptance rate. The intake quality of both 'A' level and polytechnic diploma holders also displayed strong improvements. Additionally, our new programmes have been well-received, attracting top students.

The Blue Ribbon Commission for Leaders of Tomorrow

Initiated by NTU President Dr Su Guaning, the Blue Ribbon Commission (BRC) was convened in 2007 to review all aspects of undergraduate education in the University. The Commission carried out a bottom-up review of undergraduate education in NTU to develop fundamental principles and guidelines for revising the curriculum and developing future programmes.

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Several strategic initiatives have been recommended by the BRC and the University is committed to implementing them before AY2010/2011. To this end, the BRC Implementation Committee was formed in January 2009 to spearhead the overall implementation of the BRC's recommendations. The Committee is led by the Provost as Chairman and the Senior Associate Provost as Vice-Chairman. It is supported by the following five sub-committees, consisting of faculty, senior administrators and student leaders:

- The **Academic Culture sub-committee** examines faculty's contributions in teaching, research, student advising and other services to the University and endeavours to implement specific measures to provide them with support in these areas.
- The **Effective Teaching and Learning sub-committee** examines rewards for teaching and reviews academic assessments, academic advising and career coaching practices. These are carried out to enhance teaching and learning in NTU. Among other initiatives, it will make changes to the student feedback system and pedagogical training services.
- The **New Curriculum sub-committee** focuses on curriculum-related recommendations of the BRC. The sub-committee is conducting a university-wide review of the curriculum to promote a more broad-based university education.
- The **Student Life sub-committee** looks into enhancing the non-academic aspects of a student's campus life. These aspects include residential living, student administrative services, sports facilities, and student activities and leadership.
- The **IT Infrastructure for Classroom of Tomorrow sub-committee** focuses on implementing infrastructure-related recommendations of the BRC to promote and improve interaction between faculty and students, and among students.

A World-Class University in the Making

NTU is one of the largest engineering universities in the world but through the years we have been steadily building a strong reputation as a world-class university that not only provides quality education in engineering but in other disciplines as well, such as advanced natural sciences, business, the arts and humanities, and communication. In the past year, we have made significant headway in our goal to provide a broad-based, interdisciplinary university education.

- **Official opening of the School of Art, Design and Media (ADM):** Designed by renowned architect Dr Timothy Seow, the building is an avant-garde creation that presents a symbiotic relationship between aesthetics and the green environment. The School is equipped with some of the most advanced media facilities and boasts an extensive fine arts library, two art galleries and an auditorium.
- **Establishment of a new medical school:** After months of intensive planning and deliberations, a proposal to set up Singapore's third medical school in NTU has been formally submitted to the Ministry of Education. The proposal was prepared by a task force led by Professor Jan Carlstedt-Duke, former Dean at Karolinska Institutet, Stockholm. The plan involves collaborations with Tan Tock Seng Hospital and Imperial College London. According to NTU Provost Professor Bertil Andersson, bioengineering is a key research area for the new medical school where NTU can make a major difference.
- **Launch of a new Bachelor of Science in Sport Science and Management programme:** This four-year, direct honours programme is the first of its kind in Singapore and aims to facilitate the growth of the sports and leisure industry in Singapore and the region by producing qualified professionals who are equipped with the relevant knowledge and skills to engage effectively

Graduate education continues to play a major role in cultivating and nurturing life-long learning that will propel our graduates to greater heights.



Convocation 2009 – Our pride and glory in their graduation ensemble

in the field. The programme admitted its first batch of students in AY2008/2009.

GRADUATE EDUCATION

Graduate education continues to play a major role in cultivating and nurturing life-long learning that will propel our graduates to greater heights in whatever field they choose to embark on.

Higher Enrolment, Greater Diversity

Apart from an increase in undergraduate enrolment, we have also progressed in our graduate education, in terms of enrolment rate and student diversity. Our graduate student enrolment has increased steadily each year, especially for our PhD programmes. We aim to gradually increase our PhD enrolment in order to bring the ratio of our Doctorate to

Bachelor degree enrolments to a comparable level with that of leading American and European research universities. Besides increasing our PhD enrolment, we are also starting to recruit students from Europe and the Middle East as well as from Southeast Asia, China and India.

The University also recognises the need to encourage more Singaporeans to take up PhD studies. We have been successful in this endeavour. In the past year, the number of local PhD students has increased from 241 to 329. To ensure that the figure will continue to grow in the coming years, we have introduced the following schemes:

- **Nanyang President's Graduate Scholarship:** Launched in 2008, this scheme aims to encourage graduates or final-year students to take up PhD studies. The scholarship is awarded to students who not only possess outstanding



Partnership for excellence in education – NTU and Stevens Institute of Technology, USA, launch a new Dual Master's programme

academic results but also display leadership potential. A good number of the scholarship recipients are Singaporeans who hold First Class Honours degrees.

- **Singapore-MIT Alliance Graduate Fellowship:** This scheme was launched in 2009 to attract exceptional doctoral students from NTU and the National University of Singapore to participate in strategic research projects. These projects are undertaken at the Singapore-MIT Alliance for Research and Technology Centre and co-supervised by MIT faculty. For its first intake in August 2009, three NTU students were awarded the fellowship.

Joint Initiatives, Interdisciplinary Focus

Collaborative efforts with leading institutions are underway to introduce Master's and PhD programmes that aim at world-class standards. These include the following programmes:

- **Joint Master's programme in Interactive Design:** Joint initiative between the School of Art, Design and Media and Domus Academy, a top-ranked design school in Italy.

- **Double MBA programme in Shipping, Offshore and Finance:** Joint initiative between Nanyang Business School and BI Norwegian School of Management.
- **Dual Master's programme in Systems and Project Management and Systems Engineering:** Joint initiative between the School of Mechanical and Aerospace Engineering and Stevens Institute of Technology, USA.
- **Master of Science programme in Aerospace Engineering:** Joint initiative between the School of Mechanical and Aerospace Engineering and Technische Universität München, Germany.
- **Joint PhD programmes:** Joint initiatives between NTU and several leading tertiary institutions such as:
 - Imperial College London
 - Karolinska Institutet, Sweden
 - Korea Advanced Institute of Science and Technology, Korea
 - Steklov Mathematical Institute, Russia
 - Technische Universität München, Germany

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The interdisciplinary paradigm is also an important tenet of the University's graduate programmes. This is evident in many of our new Master's offerings. Some of these programmes are:

- **Master of Science in Asian Studies:** This programme was implemented in AY2008/2009 at the S. Rajaratnam School of International Studies. It is a response to growing interest in Asia arising from its rapid economic and political developments. The course focuses on history, comparative politics, international relations and economics, enabling students to acquire the historical perspectives and analytical tools needed to understand and appreciate the dynamics and implications of new trends in Asian political economy and security.
- **Master of Science in Systems and Project Management:** This is a unique programme integrating systems engineering with project management. It also provides students with the option of pursuing a dual Master's jointly conferred by NTU and Stevens Institute of Technology, USA. To stay relevant to real conditions and needs of the industry, NTU is working closely with the Institution of Engineers, Singapore, to ensure that the programme addresses pertinent issues relating to the management of complex systems projects in the wide-ranging field of engineering.
- **Nanyang MBA in International Studies:** Jointly offered by the S. Rajaratnam School of International Studies (RSIS) and Nanyang Business School, this interdisciplinary Master's programme was introduced in AY2009/2010 to allow students to obtain simultaneously an international studies education at RSIS and gain an MBA from one of Asia's foremost business schools. It provides training in business fundamentals, accounting and finance, coupled with an understanding of international relations and international political economy.

WORLD-CLASS EDUCATION

The University, committed to the pursuit of excellence, strives to improve its place in academia as a world-class university with a vibrant research community and excellent teaching standards. Our list of accolades and new strategic initiatives are testament to our unwavering commitment towards excellence.

MBA Ranking Moving Upwards

In January 2009, Nanyang Business School (NBS) took another major step forward as a premier business school when its MBA programme was ranked 24th, up from 46th place, in the highly regarded Financial Times' Global MBA Rankings. This makes NBS the first business school in Singapore to be placed among the ranks of the top 25 business schools of the world. In Asia Pacific, the Nanyang MBA programme is ranked fourth.

Awards for Educational Excellence

The University is the recipient of several prestigious awards, including the following:

- **Excellence in Training Development Award:** This award was presented to NTU at the 2009 Singapore International Maritime Awards for its outstanding maritime education and training programmes that contribute to the development of Singapore as an international maritime hub. This is the first time an institution of higher learning has received the prestigious accolade, solidifying NTU's position as a key player in maritime education and research.
- **2009 Aerospace Academic Institution of the Year Award:** The University was also recognised at the 2009 Frost & Sullivan Asia Pacific Aerospace & Defense Awards for its outstanding role in nurturing high-calibre aerospace engineers of the future through equipping them with essential and highly sought-after skills to constantly match the industry's high standards.

Asia's First Kauffman Campus

NTU has signed a Memorandum of Understanding with the Ewing Marion Kauffman Foundation to set up Asia's first Kauffman Campus. Over the last 15 years, the Kauffman Foundation has spent significant time and resources to develop, fund and provide entrepreneurship education to build entrepreneurial economies. Even though entrepreneurship programmes traditionally come under the domain of business schools, the Kauffman Campus aims to break away from this tradition and instil the spirit of entrepreneurship among students and faculty regardless of their fields of study. As the first Kauffman Campus in Asia, we are able to capitalise on Kauffman's expertise to harness our entrepreneurship culture and enhance our innovations across various disciplines. A key driver to achieve our entrepreneurship aspiration is the Master of Science programme in Technopreneurship and Innovation, an established programme at NTU that offers a transformational educational experience: global immersion training and experiential learning.

COMMUNITY DEVELOPMENT AND ENRICHMENT

The University fosters close relations with the wider local and global community by contributing knowledge and expertise in many areas, ranging from technology and education to social awareness.

Engendering Social Change

On the local front, students and faculty members have initiated new projects that engender social change. One such activity is the Dating Violence Awareness Movement, initiated by four final-year undergraduates from the Wee Kim Wee School of Communication and Information, targeted at young Singaporeans aged 17 to 25.

At the National Institute of Education, Project Unity, an interdisciplinary art initiative, saw normally isolated segments of the Singapore community, such as prison inmates, public school students and individuals with special needs, coming together to work on a four-in-one sculpture. This project is in conjunction with the Singapore Prison Service to raise awareness in order to help ex-offenders and their families integrate into society.

Contributing to the Global Community

NTU also supports and contributes to the development initiatives of other countries around the world. The S. Rajaratnam School of International Studies, together with the Brenthurst Foundation of South Africa, jointly organised a visit by policymakers from eight African countries. They were in Singapore to learn how the country transformed itself from a Third World to a First World country. The visitors met Singapore President S R Nathan and Senior Minister Goh Chok Tong, among other high-ranking officials.

Another initiative is a humanitarian mission to Sichuan, China, jointly organised by the Civil and Environmental Engineering (CEE) Society and the Lien Institute for the Environment (LIFE), a year after the Sichuan earthquake. The trip involved students of various nationalities travelling to Sichuan to lend a hand in reconstruction efforts, teaching and interacting with primary school students, and distributing relief supplies to the earthquake victims. Such initiatives by the NTU community signify the University's sustained link with the wider society.

The University fosters close relations with the wider local and global community by contributing knowledge and expertise in many areas.



There is never a dull moment at NTU. Students are constantly engaged in a wide range of intellectual, cultural and social activities that enrich lives, develop potential and build ties that bind.



Hard at work – SPMS students using sophisticated Nuclear Magnetic Resonance (NMR) machines during their practical training

AT THE LEADING EDGE

Blazing trails and charting new frontiers in research and innovation



WIDENING MULTIDISCIPLINARY RESEARCH BASE

Our drive towards becoming a world-class, research-intensive university with many multidisciplinary core competencies has made significant headway. This is evident from the increasing number of competitive external research grants we have won, joint laboratories we have established with industry leaders, as well as the various research accomplishments in key technologies and innovations.

External Competitive Research Grants

NTU has become increasingly successful in securing external peer-reviewed competitive grants. There has been a dramatic rise in the amount of competitive grants awarded to the University, from S\$57 million in Financial Year (FY) 2005 to S\$169 million in FY2008. Since FY2007, NTU has garnered S\$90 million from the National Research Foundation – Competitive Research Programme (NRF-CRP) alone. This represents the highest proportion of NRF-CRP grants awarded to a particular institution.

NTU researchers have also built up expertise in the environment and water research, and interactive digital media. In recent calls for proposals, NTU has been successful in capturing the lion's share of research funds from the Environment and Water Industry Development Council (EWI). In addition, the University won 10 out of 13 awards to carry out research in interactive digital media. This success in securing competitive grants is especially encouraging, particularly in view of the increasingly stringent peer review process for competitive funding programmes. It also highlights the relevance of NTU's research expertise to these research funding initiatives.

NTU is increasingly successful in winning competitive grants, from S\$57 million in FY2005 to S\$169 million in FY2008.

Our strong performance in competitive grant calls is attributed to the implementation of initiatives that aim to cultivate research excellence in the University. These include recruiting global research leaders and teams, funding research activities in niche areas, and running effective investigator-led research programmes at NTU.

In FY2008, we secured substantial research grants from the following sources:

- National Research Foundation (NRF)
- Ministry of Education (MOE)
- Agency for Science, Technology and Research (A*STAR)
- Ministry of Defence (MINDEF)
- Economic Development Board (EDB)
- Other Government Bodies
- John D. and Catherine T. MacArthur Foundation
- Industry

Breakthroughs in Science and Technology

Our research has culminated in the following notable achievements:

- **Alternative energy racing car:** The College of Engineering led and funded the development of a prototype solar-powered racing car. Designed and built by a team of 25 students from the School of Mechanical and Aerospace Engineering and the School of Electrical and Electronic Engineering, this car won an award at the Shell Eco-marathon Europe competition in Germany in May 2009.
- **Antenna-in-Package solution:** The research collaboration between NTU and SIMTech has resulted in the successful development of the first Antenna-in-Package solution used in Low Temperature Co-fired Ceramic technology for producing single-chip, 60 GHz radios. This solution was made possible through the amalgamation of NTU's

expertise in 60 GHz radio electronics, antenna design and characterisation with SIMTech's strength in package design and fabrication.

- **Assisted Celluloid Animation software:** A team of researchers led by Professor Seah Hock Soon from NTU's School of Computer Engineering developed this computer animation software, which reduces the time needed for animators and designers to produce animations from days to just minutes. The software, with its object replication and file compression features, is particularly appealing to animators and designers. The technology will be ready for commercial application soon.
- **Weapon against malaria:** A research team from the School of Biological Sciences has discovered that a compound originally developed to kill cancer cells could be a potential weapon against malaria, one of the most lethal infectious diseases on Earth. Laboratory tests have shown that the compound disrupts the genetic "programme" of the most common parasite linked to malaria. Additionally, the team has also identified a part of the compound that triggers the human immune system to produce antibodies against the parasite, paving the way for the possible development of the first malaria vaccine.
- **Earthquake and tsunami forecasts:** At NTU's Earth Observatory of Singapore, a team of researchers discovered that corals off the west coast of Sumatra produce annual growth rings, similar to those found on tree trunks, which record cyclical environmental events like earthquakes. According to the study, which was published in the prestigious journal *Science*, the growth rings on the corals can potentially predict a massive earthquake in the eastern Indian Ocean within the next 30 years.
- **Energy-efficient compressor:** Associate Professor Ooi Kim Tiow and his research associate, Mr Teh Yong

NTU is actively intensifying research and widening its multidisciplinary base.



NTU students excel at the Shell Eco-marathon Europe with their solar-powered sensation

Liang from the School of Mechanical and Aerospace Engineering, have successfully produced a compressor for heating and cooling systems that can save up to US\$16 billion in energy annually, which is about 10% of the annual cost to run the systems worldwide. NTU was the only Asian university chosen from over 300 submissions worldwide to present at the 2008 World's Best Technologies Showcase in Texas, USA.

- **First green super chip:** A team of scientists from the School of Electrical and Electronic Engineering and Rice University, USA, has successfully created a new environmentally-friendly super chip which consumes 30 times less energy and runs seven times faster than the most sophisticated technology available today. This revolutionary breakthrough is capable of exponentially reducing energy consumption and improving the performance of various technological products by a whopping 200 times. The green super chip has been

endorsed by Intel Microprocessor Technology and will make its appearance in the commercial market in about four years' time.

- **HMGA2 gene discovery:** At the School of Biological Sciences' Genomics and Genetics Division, Professor Peter Droge and his team have discovered what gives cancer cells a more robust phenotype. The scientists uncovered a gene - HMGA2- which encodes for a protein involved in repairing DNA damage inflicted during chemotherapy. This renders cancer cells more resistant to certain chemotherapeutic drugs. The study is the first that links the DNA repair activity of HMGA2 to chemoresistance of cancer cells, and has the potential to improve both cancer cell diagnosis and therapy.
- **Nanotechnology application for membrane filtration:** Water technology experts from the School of Civil and Environmental Engineering, Stanford University and

the Public Utilities Board, together with the support of The Enterprise Challenge from the Prime Minister's Office, have successfully set up a plant piloting the use of a nano-sized, crystal-like material. The material eliminates micro-organisms and does not produce waste materials during the water purification process. This groundbreaking technology has the potential to alleviate the cost and energy consumption involved in the production of clean drinking water.

- **Singapore's first Global Positioning System (GPS) film and software:** The University has premiered the first-ever GPS film and software in Singapore, which presents a novel way of watching movies on-the-go, by keeping track of the viewer's location and screening different segments of a movie depending on the locations. The innovation was conceptualised by Professor Scott Hessels from the School of Art, Design and Media in collaboration with students from his School and from the School of Computer Engineering.
- **Solution X-ray Scattering experiment:** The School of Biological Sciences has partnered with the European Molecular Biology Laboratory in Hamburg, Germany, to conduct a remotely controlled Solution X-ray Scattering experiment. The experiment, initiated by the School in Singapore on 26th May 2009 and conducted at the German Electron Synchrotron in Hamburg, was a success, paving the way for such experiments to be carried out more commonly in the future. The unconventional experiment demonstrates how scientists, with the use of the synchrotron, can control and conduct their research without the need to be physically present at the research facility, saving them time and costs.

Other Significant Research Endeavours

Apart from breakthroughs in the areas of science and technology, the University is also an emerging leader in research involving a novel combination of disciplines.

The S. Rajaratnam School of International Studies (RSIS), along with China's Peking University and Korea's East Asia Institute, was selected by the MacArthur Foundation, USA, as one of the three core institutions for its Asia Security Initiative. Awarded through open international competition, the initial grant is US\$2.5 million over 3 years. This is the largest grant awarded by the Foundation to a single institution under the Initiative. Through the award, the School will begin research on a wide range of Asian security issues such as internal conflicts, human security, environmental security and climate change.

Together Again (Wood Cut), a unique exhibition organised by the School of Art, Design and Media, was showcased at the Post-Museum in Little India in May 2009. The 14 art pieces created by ADM's Professor Lucy Davis consist of prints made from discarded wooden objects. The prints were torn into fragments before being used to form collages in the shape of the trees from which the objects were made. The ingenious art work has generated international attention after an interview with Reuters, published in June 2009, appeared in several international news websites such as ABCNews.go.com, MSNBC.com, and News24.com.

ACHIEVING RESEARCH EXCELLENCE THROUGH STRATEGIC ENDEAVOURS

This has been an exciting year for NTU as we pursue our goal of research excellence. As we continue to intensify research in this University, we have set in motion several strategic measures to strengthen our multi-disciplinary base.

Worldwide Search for Top-notch Faculty

We recognise the importance of attracting leading professors to conduct cutting-edge research at the University and also recruiting outstanding researchers, especially among the brightest postdoctoral fellows and

The NRF Research Fellows and Nanyang Assistant Professors have found NTU to be an excellent place to launch their academic careers and create research breakthroughs.

research students. This is one of our strategic approaches to progressively establish exceptional research teams in our core research areas.

The University welcomes the following professors:

- **Professor Bo Liedberg** from Linköping University, Sweden, who is a forerunner in developing the protein binding studies (BioCore) approach and will be developing new bio-sensors at NTU.
- **Professor Chiu Chi-Yue** from the University of Illinois at Urbana-Champaign, USA, whose research focuses on cultures as knowledge traditions and the social, cognitive and motivational processes that mediate the construction and evolution of social consensus.
- **Professor Chris Newhall** from the US Geological Survey, USA, who studies volcanic processes, with a focus on pre-eruption processes that control whether, when, and how explosively a volcano will erupt. He has previously developed the Volcanic Explosivity Index (VEI).
- **Professor Christos Panagopoulos** from the University of Cambridge, UK, and recipient of the European Young Investigators Award, who currently focuses on condensed matter systems with spontaneous tendencies toward complex electronic pattern formation at a range of temperatures especially close to absolute zero.
- **Professor Hong Ying-Yi** from the University of Illinois at Urbana-Champaign, USA, whose research interests include culture and cognition, self, identity and inter-group relations.
- **Professor Kang Jun-Koo**, formerly Federal Credit Union Endowed Chair in Financial Institutions and Investments at Michigan State University, USA, who is now with Nanyang Business School to contribute his expertise in finance, corporate governance, capital raising, internal portfolio allocation, and banking.
- **Professor Kerry Sieh** from the California Institute of Technology, USA, a leading earthquake geologist who has worked extensively in the Banda-Aceh region in Indonesia. He is now leading the Earth Observatory of Singapore (EOS), a Research Centre of Excellence (RCE).
- **Professor Maria-Elisabeth Michel-Beyerle** from Technische Universität München, Germany, who is now with the School of Physical and Mathematical Sciences working on electron transfer mechanisms, especially in protein and similar molecules.
- **Professor Nadia Thalmann** from the University of Geneva, Switzerland, who founded the MIRALab for research in the electronic representation of the human form and its movements.
- **Professor Pär Nordlund** from Karolinska Institutet, Sweden, who will establish a new laboratory for structural genomics at NTU's new graduate school for life sciences.
- **Professor Paul Tapponnier** from Institut de Physique de Globe, Paris, France, who is the most influential and accomplished neo-tectonicist of his generation. He discovered the great active faults of Tibet and how they are accommodating the collision of India into Asia.
- **Professor Rudolph A. Marcus** from the California Institute of Technology, USA, who won a Nobel Prize in Chemistry (1992) for his theory of electron transfer.
- **Professor Staffan Kjelleberg** from the University of New South Wales, Australia, and **Professor Yehuda Cohen** from the Hebrew University of Jerusalem, Israel, both world leaders in Environmental Life Sciences who will be developing a new laboratory for environmental biotechnology.

Recruitment of World-Class Early Career Faculty

With the completion of the second year of the highly competitive National Research Foundation (NRF) Research Fellowship Scheme, NTU has proven to be an attractive research hub. In 2009, seven fellowship holders chose to base their research work at NTU, up from four in the previous year. This is an endorsement by our new colleagues of NTU as an excellent place to launch their academic careers and create important research breakthroughs. To recruit exceptional researchers, the University continues to give out awards through the following schemes:

- **Nanyang Assistant Professorship:** In alignment with the University's aim to recruit bright young faculty from across the globe, the Nanyang Assistant Professorship (NAP) Scheme was introduced in 2007. Each successful candidate is awarded a start-up grant of up to \$1 million to kick-start a fledgling academic career. The inaugural NAP call attracted over 300 applicants, out of which six were selected. In the second NAP invitation, we received more than 600 applications and selected seven young researchers to receive the award.
- **Nanyang Postdoctoral Fellowship:** We believe that exceptional postdoctoral fellows are critical to the production of high-quality research outcomes. Apart from the NRF and NAP schemes, we are launching the Nanyang Postdoctoral Fellowship Scheme to attract the best young talents from around the world to carry out quality research in NTU. The scheme also aims to provide a stepping stone to successful academic careers.

New Strategic Platforms

In support of our research directions and priorities, we have launched several new research centres.

- **Earth Observatory of Singapore (EOS):** The EOS, which was awarded S\$150 million by NRF and MOE, is a new Research Centre of Excellence for earth

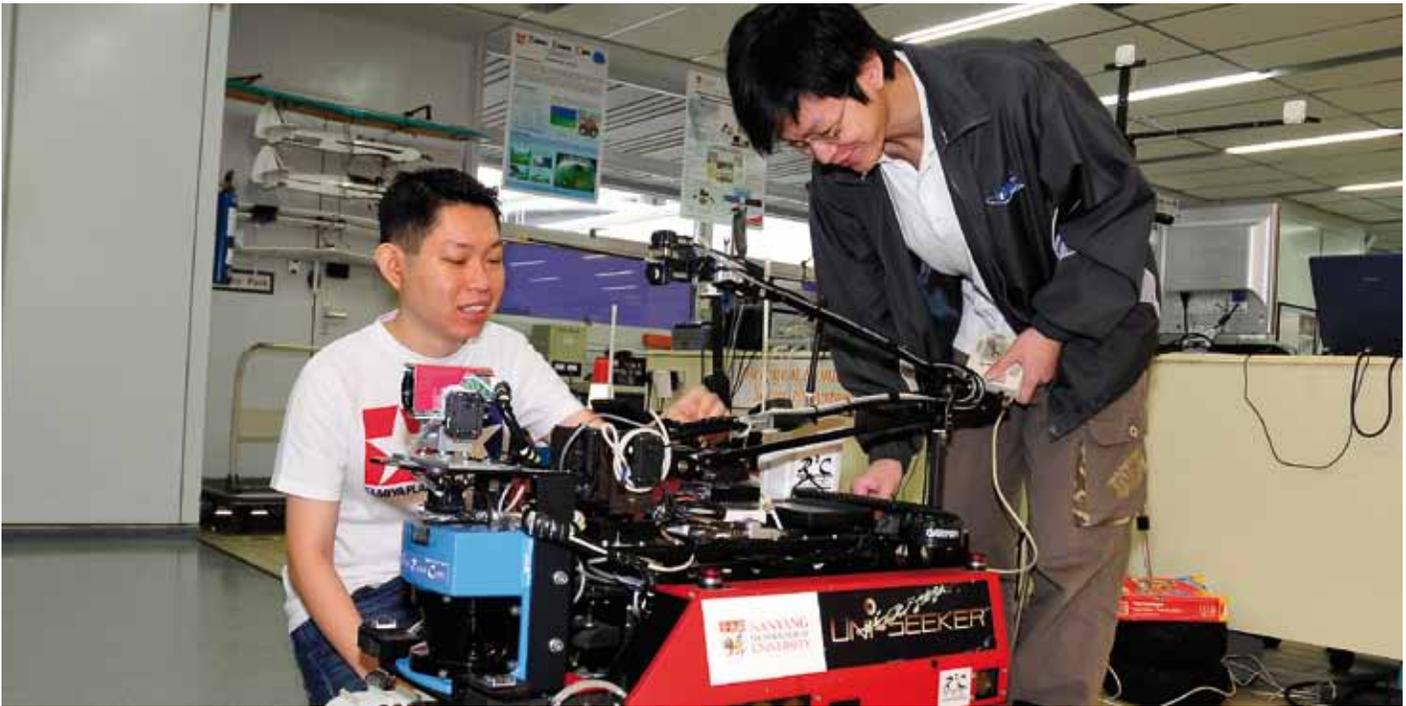
sciences, focusing on tectonics and volcanology. Many world-renowned researchers have come on board to pool their expertise in developing the centre, which is led by Professor Kerry Sieh, a world-famous seismologist.

- **Institute for Media Innovation (IMI):** Launched in 2008, IMI brings together various interactive digital media-related research activities within the four colleges of NTU as well as the National Institute of Education, further strengthening the interdisciplinary emphasis of the University.
- **Nanyang Environment and Water Research Institute (NEWRI):** This institute can be considered as an "ecosystem" of sorts, which strives to sustain a wide range of environmental and water technologies research, including investigations on membrane technology, resource reclamation and remediation, bioreactors, sensor technology and photo-catalysis. It is a research hub of excellence conducting cutting-edge research in close collaboration with the industry and supporting the research endeavours of a large pool of graduate students.
- **Energy Research Institute at NTU (ERI@N):** The establishment of ERI@N marks the start of important industrial partnerships with key players in the area of renewable energy which include Rolls-Royce, Robert Bosch and Vestas. While the core focus of the Institute is to develop research in renewable energy technologies, the Institute is aware that successful research entails addressing socio-economic as well as legislative issues. With this in mind, research at ERI@N involves all the Colleges at NTU, making research truly interdisciplinary.
- **Environmental, Life Sciences and Engineering Research Centre:** A research centre bridging research in life sciences and engineering has been established in the University. The centre aims to attract world-leading

The University is committed to employing the best international practices to achieve research standards that are comparable to leading universities.



An ERI@N initiative – First Annual Workshop on Energy Research



Students from COE all set to compete at the first TechX Challenge robotics competition with their robot, Uni-Seeker

scientists to initiate research activities at NTU that will ultimately lead to the creation of a new research discipline in bio-films.

- **Structural Genomics Group:** Linked closely with A*STAR, the Structural Genomics Group is a new research establishment located in the Institute of Molecular and Cell Biology (IMCB). The establishment of NTU Lab @ IMCB creates beneficial synergy between NTU researchers and their colleagues in the A*STAR Institutes.

Robust Internal Processes for High-quality Assessment

The University is committed to employing the best international practices for all our research processes. This entails the setting up of international advisory groups

and other special committees to achieve high research standards that are comparable to leading universities of the world.

The following initiatives have been implemented, towards this aim:

- **NTU Research Council:** Chaired by Professor Bengt Nordén from Chalmers University of Technology, Sweden, the Council functions as an independent peer review panel for the Nanyang Assistant Professorship, as well as ensures the quality of the Ministry of Education Tier 1 and Tier 2 research proposals. The Council is the final authority in deciding the technical merits of research proposals for short-listing and recommending to the Provost.

- **Systematic review of research centres:** NTU has initiated a review of all university-funded research centres across the University. The research centres are grouped into five clusters:
 - Civil and Mechanical Engineering
 - Computer and Software-related Engineering
 - Electrical and Materials Engineering
 - Life Sciences and Bio-related Engineering
 - Management and Social Sciences

To ensure a rigorous evaluation, the reviews are carried out by renowned scientists and external academics in their respective fields.

DEVELOPING WORLD-CLASS STANDARDS THROUGH RESEARCH INFRASTRUCTURE AND RESEARCH INTEGRITY

NTU has invested in new research facilities to support its drive towards producing world-class research. The following are some of the University's research infrastructure investments at its various research centres:

- The High Performance Computing Centre (HPCC) has installed **green supercomputers** that can automatically be adjusted to specific energy levels and speed up data centre transactions, thus reducing electricity consumption. This investment represents a significant boost to NTU's research efforts as HPCC will now be able to support advanced modelling in a wide variety of disciplines.
- The Structural Genomics Group is in the process of establishing a world-class **protein production laboratory** to be headed by Professor Pär Nordlund, one of Europe's most influential structural genomics scientists. The laboratory will facilitate research collaborations between NTU and other researchers based in Singapore.

- The School of Electrical and Electronic Engineering has set up the **Nanyang Nanofabrication Centre** to further research in nanofabrication and advanced silicon-based research. The Centre is equipped with extensive clean room facilities and advanced wafer fabrication equipment. The Centre not only serves the University but also external users, including companies. It will also train skilled manpower for the local microelectronics industry and plays an important role in grooming future leaders for Singapore to stay competitive in the semiconductor industry.
- The School of Materials Science and Engineering has established the **Facility for Analysis, Characterisation, Testing and Simulation** to provide advanced analytical facilities for research in electron microscopy and microanalysis, and X-ray diffraction analysis. The facility is also open to scientists and engineers from other universities, private companies and A*STAR research institutes.

High-quality research also requires researchers who are committed to the highest standards of ethical behaviour in carrying out their investigations. At NTU, we continue to emphasise that both budding and established researchers must possess research integrity.

Several initiatives are underway to accomplish this aim, including the establishment of the NTU Research Integrity Policy and Procedures in early 2008 and the setting up of an Institutional Review Board for all research activities involving sentient participants and human biological materials. Additionally, the 2010 Second World Conference on Research Integrity will see NTU collaborating with NUS, SMU and A*STAR, with the support of the National Research Foundation and the Ministry of Education, to address research integrity issues defined principally as falsification, fabrication and plagiarism.



Launch of the Global Alliance of Technological Universities at NTU

GLOBAL NETWORKS

Fostering strategic alliances with local and international partners



FORGING GLOBAL CONNECTIONS

In support of Singapore's call to become a vibrant research and educational hub, the University has forged many new partnerships with universities and research institutions around the world. These partnerships will enable NTU to strengthen its already established niche areas, and at the same time, explore and develop new research and academic initiatives to support its multidisciplinary philosophy.

Strategic Alliances with Eminent Global Institutions

The University is proud to be a member of several strategic global alliances that comprise leading international institutions. These alliances are effective platforms for NTU to contribute significantly to global developments in research and education.

- **Global Alliance of Technological Universities (GlobalTech Alliance):** NTU played a major role in the establishment of the GlobalTech Alliance, which brings together world-renowned tertiary institutions from Asia, Europe and North America. It was officially launched at NTU in April 2009. An inaugural forum was held in conjunction with the launch which saw the coming together of senior representatives from the GlobalTech Alliance to discuss the role of technological universities in the 21st century. NTU's President Dr Su Guaning was elected Chair of the Alliance, with NTU serving as the secretariat until April 2011.

This coalition will play a significant role in advocating the ever-growing importance of technology across the globe. It will explore issues that have a great impact on society, the economy and environment such as biomedicine and healthcare, sustainability and global environmental change, national security, and energy, water and food supplies.

In support of Singapore's call to become a vibrant research and educational hub, the University has forged many new partnerships with universities and research institutions around the world.

The seven founding universities of the Alliance are:

1. California Institute of Technology (USA)
 2. Swiss Federal Institute of Technology Zürich (Switzerland)
 3. Georgia Institute of Technology (USA)
 4. Imperial College London (UK)
 5. Indian Institute of Technology Bombay (India)
 6. Nanyang Technological University (Singapore)
 7. Shanghai Jiao Tong University (China)
- **Global Partnership in Environmental Sciences:** The partnership between NTU, the Hebrew University of Jerusalem, the University of New South Wales and the Graduate University of Chinese Academy of Sciences will enable these institutions to harness collective capabilities that will lead to the development of cutting-edge research in environmental science. The collaboration, an expansion of NTU's global research in this area, aims to develop more effective environmental applications and solutions to ensure the provision of clean air and water. Additionally, the partnership makes a significant contribution to Singapore's effort in becoming a global hub for research and investments in environmental science.
 - **World Educational Research Association (WERA):** In November 2008, presidents from 23 educational research associations gathered at the National Institute of Education to jointly set up this inaugural global association which aims to advance education research as a scientific and scholarly field. Through WERA, the research findings of any member can be swiftly disseminated to the rest so that best practices can be shared.

International Partnerships with Leading Universities

During the course of Academic Year (AY) 2008/2009, NTU spearheaded new research centres and research initiatives in partnership with the following institutions:

- **Belarusian State University of Informatics and Radioelectronics, the Republic of Belarus:** An MOU was signed to capitalise on the research expertise of both universities in the fields of information science, radio engineering and telecommunications.
- **Boston College, USA:** An MOU was signed to make student exchange possible between the two institutions. The MOU also covers potential research collaborations with several of Boston College's research teams and centres, such as the Teachers for a New Era research team and the Progress in International Reading and Literacy Study International Study Center.
- **Center for Mathematical Modeling, University of Chile, Chile:** An MOU was signed to enable both institutions to pursue exchanges of students and faculty for research or teaching, particularly in the areas of mathematics and mathematics education.
- **Centre National de la Recherche Scientifique (CNRS):** NTU has partnered with this centre to gain opportunities in linking up with French universities to initiate research collaborations.
- **Computer Science and Artificial Intelligence Laboratory (CSAIL):** Through its collaboration with the Massachusetts Institute of Technology's CSAIL, the University is working on developing bilateral projects in interactive digital media and language processing. This partnership involves not only research collaborations but also the agreement to offer double PhD programmes that involve joint supervision of students who will spend time in both universities to complete their studies.

NTU played a major role in the establishment of the GlobalTech Alliance, which brings together world-renowned tertiary institutions from Asia, Europe and North America.

- **European Union (EU) Centre:** NTU led the establishment of the Centre for Singapore which is currently housed at NTU's one-north campus. The EU Centre, with NTU and the National University of Singapore as stakeholders, together with the European Commission (EC), has been in operation since mid-2008. Funded partially through an EC grant, the Centre concentrates on policy research as a means of increasing knowledge about the EU, one of Singapore's major trading partners. Additionally, the Centre is also looking into integrating EU studies into postgraduate courses run by the Nanyang Business School and the S. Rajaratnam School of International Studies to strengthen the academic rigour of the political science and economics disciplines in NTU.
- **Fraunhofer-Gesellschaft, Germany:** Also known as the Fraunhofer Society, this is a leading German research institution consisting of 60 member institutes spread across Germany. The collaboration enables NTU to strengthen research in interactive digital media and provides a link between NTU and several universities in Germany and Austria to advance the University's global research initiatives.
- **Singapore-MIT Alliance for Research and Technology (SMART) Centre:** Funded by the National Research Foundation of Singapore, the SMART Centre is a major research enterprise established by the Massachusetts Institute of Technology (MIT). NTU has been working closely with the Centre in research initiatives under its three interdisciplinary research groups: BioSystems and Micromechanics, Centre for Environmental Sensing and Modelling, and Infectious Diseases. Both NTU and the SMART Centre will also endeavour to encourage more joint supervision of PhD talent between NTU faculty and the Centre's principal investigators, as well as recruit high-calibre postdoctoral fellows to take on research work in the respective interdisciplinary research groups.
- **Stanford University, USA:** Nanyang Business School's Centre for Asia Pacific Technology Law and Policy together with Stanford have jointly developed a new model to manage intellectual property in the virtual world. This led to Singapore's version of the Creative Commons Project. The Creative Commons is an award-winning and ground-breaking effort involving top names in the IT industry such as Microsoft, IBM, Google and eBay. Singapore's version aims to increase the amount of creative work (in terms of cultural, educational and scientific content) available in the virtual domain for free and legal use through the Creative Commons licences. These licences enable people to easily change their copyright terms from "All Rights Reserved" to "Some Rights Reserved".
- **Technische Universität München (TUM), Germany:** The joint NTU-TUM Workshop was organised to provide a sharing platform for academics, researchers and industry players in the areas of aerospace engineering, integrated circuit design and microelectronics. Well-known industry players such as EADS and Siemens were invited to share updates and industry perspectives.
- **University of California, Berkeley, USA:** The NTU-University of California, Berkeley Workshop marks the start of collaborative efforts in the areas of energy efficiency, synthetic biology and stem cell research. This is the first partnership between both universities that will involve exchange visits by faculty and students to work on the joint projects.
- **University of California, Los Angeles, USA:** NTU is part of a joint initiative involving the University of California, Los Angeles, and 12 other institutions to set up the University of California's Center for Environmental Implications of Nanotechnology, which aims to further research in the environmental, health, and safety implications of nanomaterials. NTU is the only university in Asia participating in the inter-university collaboration.

Signing of Memorandum of Understanding

between
Nanyang Technological University
and
Marion Kauffman Foundation

Thursday, 18 December 2008



The first Asian Kauffman Campus – A partnership with the Ewing Marion Kauffman Foundation

- **University of Electronic Science and Technology, China:** A joint research agreement was sealed to facilitate research in the area of software radio technology. Under the initiative, both universities will host exchange visits by faculty, and graduate and undergraduate students.

Collaborative Efforts with International Corporate Agencies

NTU is the partner of choice for many international corporations which are leading players in their respective fields, such as solar energy, water technologies, materials engineering and finance. Our collaborations with industry players, especially well-known companies such as Rolls-Royce, EADS, Infineon, Siemens and THALES, are very much a part of our commercialisation, innovation and entrepreneurship thrust. They bring about technology transfer and the cross-fertilisation of ideas between the University and industry, which are instrumental in driving more industry-relevant research.

Some of the leading corporations partnering with NTU include:

- **Bosch Group:** Bosch has invested S\$30 million to establish a corporate research and advanced engineering facility located in NTU to further research in solar energy. At present, Bosch and NTU are working together to develop organic photovoltaic cells that can help to increase cost-efficiency when producing solar products.
- **China Construction Bank (CCB):** The University signed an MOU with China Construction Bank, the world's second largest bank in terms of market capitalisation, to train more than 700 senior executives from the bank. The MOU provides a broad framework for the Nanyang Business School and the Bank to develop financial training programmes with a customised curriculum

to meet the bank's training needs in the areas of private banking, marketing, asset management and risk management.

- **European Aeronautic Defence and Space Company (EADS):** The University is collaborating with EADS on aerospace projects involving the helicopter airspeed sensor for Eurocopter, a subsidiary of EADS. The Company is also awarding scholarships worth \$5,000 each to NTU's top final-year Mechanical and Aerospace Engineering students. This is a long-term collaboration between both parties that aims to develop future aerospace engineers and researchers of Singapore.
- **Learning Activity Management System (LAMS) International:** NTU is now the official training centre for LAMS in Singapore and Southeast Asia. With this partnership, NTU has become the first educational institution in the region to benefit from a powerful online learning tool that supports the development of highly engaging and interactive virtual learning activities that cater to individual learning styles and preferences.
- **Nitto Denko Corporation:** An agreement was signed with the leading Japanese materials firm to develop state-of-the-art organic electronic sensing devices using plastic instead of silicon. This collaboration is expected to result in the creation of smaller and better electronic devices for the healthcare industry. Organic electronics, also known as plastic electronics, has been identified as a new growth area by Singapore's Economic Development Board, as it is lighter, more flexible and less expensive than current high-tech alternatives.
- **Pipeline Micro Asia:** A partnership agreement was sealed to provide cost- and energy-efficient cooling solutions using piezoelectric micro-pumps for electronic devices. Under the agreement, Pipeline Micro USA will invest S\$1 million to spearhead the research collaboration.

NTU is the partner of choice for many international corporations which are leading players in their respective fields.



A partnership to enhance education involving NTU, Ngee Ann Polytechnic and the School of Science and Technology

- **Rolls-Royce:** A five-year engineering research agreement sealed the partnership between NTU and British engineering firm, Rolls-Royce. Through this collaboration, researchers from NTU and Rolls-Royce will carry out research to improve the manufacturing process of engine parts.
- **Siemens:** NTU and Siemens have signed a four-year Master Agreement to pursue research in membrane distillation. The research will be undertaken in the Singapore Membrane Technology Centre, which is part of the University's Nanyang Environment and Water Research Institute.
- **Thales@NTU:** This is a laboratory jointly established by NTU, Thales Research & Technology, France, and Thales Technology Centre, Singapore. It capitalises on the University's academic and research capabilities and the Thales Group's state-of-the-art technology to develop technological innovations that can be harnessed for both commercial and homeland security applications. The Laboratory will also work closely with other research agencies, such as the Agency for Science, Technology and Research (A*STAR) and Defence Science Organisation (DSO) National Laboratories, to coordinate and develop synergistic research and development programmes.
- **Toray Industries, Incorporated:** The Toray Water Technology Laboratory has been recently established in Singapore. NTU's Environment and Water Research

The University has partnered with various local private and public agencies to help to shape and refine the future socio-economic growth of Singapore.

Institute was chosen to partner with Toray to develop innovative water treatment technologies.

ESTABLISHING LOCAL LINKAGES

Through the years, the University has been single-minded in its support of national growth and development. With this in mind, it has partnered with various local private and public agencies to work on a diverse range of projects that will help to shape and refine the future socio-economic growth of Singapore.

Among the corporate and government agencies collaborating with NTU are:

- **Campus for Research Excellence and Technological Enterprise (CREATE):** The National Research Foundation of Singapore has spearheaded CREATE to attract leading universities such as the Massachusetts Institute of Technology, USA, and the Swiss Federal Institute of Technology Zürich to conduct advanced research in partnership with NTU and the National University of Singapore. NTU's one-north campus has been identified as the research base for this initiative.
- **Computer Security Lab:** In collaboration with the Centre for Strategic Infocomm Technologies, an agency in Singapore's Ministry of Defence, NTU has established the Computer Security Lab. The Lab will conduct advanced research and provide state-of-the-art solutions in the areas of software security, binary code protection, operating system security and mobile platform security.
- **Infocomm Development Authority:** A new talent programme known as ELITe has been set up to nurture infocommunications professionals of the future. Sixteen students from the School of Computer Engineering participated in the programme, which includes hands-on opportunities within the industry through industrial attachments, mentorships and academic projects.
- **Maritime Port Authority:** The partnership between NTU and the Maritime Port Authority involves a joint project to write case studies on the maritime sector in Singapore. The project hopes to enhance understanding about and scholarship in this important sector of Singapore's economy. Two cases currently under development focus on the ship-broking sector and the Port of Singapore Authority.
- **Ministry of Education:** At Lianhe Zaobao's 85th Anniversary Gala Dinner, Prime Minister Lee Hsien Loong announced the launch of the Singapore Centre for Chinese Language at NTU. The University will collaborate with the Ministry of Education to provide in-service training for Chinese Language teachers.
- **Nan Chiau Primary School:** The Centre for Educational Research and Application is the first research centre in Singapore located in a primary school. Classroom practitioners from Nan Chiau and educational researchers from the National Institute of Education will work together to promote the use of educational technology that aligns research with real classroom practices.
- **Ngee Ann Polytechnic:** NTU has partnered with Ngee Ann Polytechnic to develop enrichment programmes for Singapore's upcoming School of Science and Technology. The partnership involves the areas of curriculum, facilities and student development. This aligns with the school's plan to provide a creative applied learning environment for its students.
- **Sembcorp:** NTU's Environment and Water Research Institute and Sembcorp will work together over the next three years to explore cutting-edge technology that can be used to treat complex industrial wastewater. This collaboration underscores NTU and Sembcorp's commitment towards employing the best available

technology to meet Singapore's water and wastewater treatment needs.

- **Singapore Armed Forces (SAF):** The S. Rajaratnam School of International Studies' Military Transformation Programme established an SAF-NTU partnership, which encompasses three categories of joint initiatives: the Continuing Education Programme for students of the Singapore Command and Staff College, the Undergraduate Professional Military Education Programme for SAF officers and the SAF-NTU Academy on campus which will oversee and manage all of the University's educational activities with the SAF.
- **Singapore Totalisator Board:** In partnership with the Totalisator Board, the University began a new Case Study Research and Writing Project on the social service sector in Singapore. The project's goals include developing a collection of case studies on managerial and organisational issues, publishing the case studies through the Asian Business Case Centre's website, as well as conducting case teaching workshops on participant-centred learning.
- **ST Kinetics:** Through the combined capabilities of ST Kinetics and NTU, the first cold spray research centre in Southeast Asia was set up in Singapore. The three-year collaboration is a joint commitment of half a million dollars in equipment and infrastructure development from both organisations. The ST Kinetics-NTU Cold Spray Research Centre, a sophisticated robotic-controlled research laboratory located in the ST Kinetics plant, was officially opened in September 2008.
- **ST Microelectronics:** NTU and ST Microelectronics signed a Master Research Collaboration Agreement to pave the way for collaboration in semiconductor research. The agreement is tenable for three years and is focused on research in carbon nanotubes.

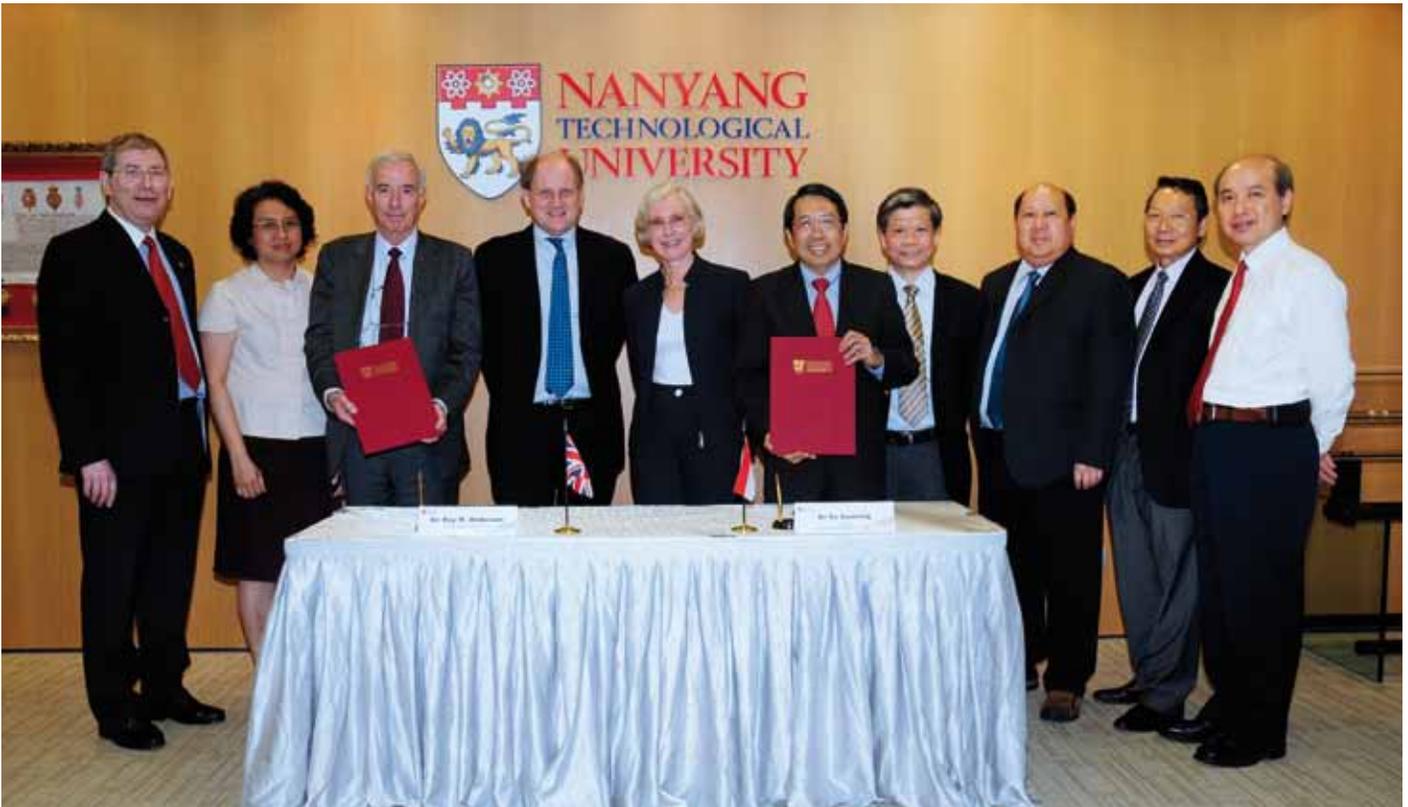
SUPPORTING ACADEMIC ENTERPRISES

Our state-of-the-art inventions are at the cutting edge of scientific and technological developments, breaking academic boundaries. We have successfully established several start-ups, not only to support our R&D efforts, but also to launch our inventions commercially.

The following list includes some of NTU's start-ups:

- **CardioRev Pte Ltd:** In partnership with Mayo Clinic and Nile Therapeutics, CardioRev Pte Ltd was founded by two NTU professors to address current issues associated with cardiac stent treatment.
- **Membrane Instruments and Technology Pte Ltd:** This company will work towards improving the design and operation of membrane processes. At the same time, it will also begin commercialising its novel invention, the *Membrane Integrity Sensor*.
- **Nanofrontier Pte Ltd:** An R&D company wholly-owned by NTU, Nanofrontier has been actively collaborating with overseas companies, such as Analytical Nanotechnologies (UK) PLC and Roar Particles Ltd (PLC), and is attracting them to carry out their R&D work in Singapore.
- **NTU Ventures Pte Ltd:** This company launched an incubation scheme to assist and promote the formation of NTU start-up and spin-off companies by leveraging two government funding schemes: Spring Singapore's Entrepreneurial Talent Development Fund and the Media Development Authority's Microfunding Scheme. Through the incubation scheme, NTU Ventures is able to play a more proactive role in encouraging the development of business ideas to expedite the commercialisation of NTU inventions. The scheme has assisted in the formation of seven start-up companies.

We have successfully established several start-ups, not only to support our R&D efforts, but also to launch our inventions commercially.



Another significant partnership sealed with Imperial College London

- **Printed Power:** This company was established to address the problems encountered by current battery technologies, in order to fulfil the requirements of various technological applications such as smart tags and ambient lights.
- **Ree-Trakt:** As a next-generation, disposable soft-tissue surgical retractor system, Ree-Trakt is designed to minimise tissue trauma, optimise retraction force and lower the risk of infection. Jointly developed with California-based Inshitra Medical Inc, Ree-Trakt has been launched commercially in 20 countries.



ASPIRE AND INSPIRE

Soaring to new heights in the pursuit of excellence



STUDENT ACHIEVEMENTS

Our students are our pride and glory. They have helped put NTU on the world map with their accolades garnered in various competitions. From conceptualising creative business plans to displaying passion and commitment in sports, our students have done us proud. Their successes are a testament to their all-rounded capabilities, reinforcing NTU's broad-based, interdisciplinary educational philosophy.

Achievements in Innovative Ideas and Inventions

We celebrate our students' victories in a number of local and international competitions. These competitions include:

- **Global Investment Research Challenge:** Four students from the Nanyang Business School won the Global Investment Research Challenge, organised by the Chartered Financial Analyst Institute in April 2009. The team consisting of Terence Lim Ying Fan, You Yewei, Krystle Liew Tianni and Jeremy Teo Jun Liang competed against teams from leading universities such as Harvard University, Massachusetts Institute of Technology, Columbia University, New York University, Duke University, University of London and Imperial College London. The team's winning case was a presentation on Singapore-listed transport company, ComfortDelGro.
- **L'Oréal Brandstorm 2009:** NTU's Team Magnifique, comprising undergraduates Britney Cheong Wei Hua, Ng Yi Han and Jessica Ong Hwee Hoon, clinched the title of L'Oréal Brandstorm National Champions in May 2009 after defeating seven other university teams. The first-runner up position also went to an NTU team, Team Exuparantia, with members Aarti Assodani, Lee Shin and Praba Saundarajoo from the School of Biological Sciences. The teams from NTU impressed the international panel of judges with their marketing finesse, originality and strong team spirit. The annual

*From conceptualising creative business plans
to displaying passion and commitment in
sports, our students have done us proud.*



Nanyang Business School students won the Singapore finals of L'Oréal Brandstorm 2009
(Picture courtesy of L'Oréal Singapore)

L'Oréal Brandstorm is a recruitment platform to talent-spot high-calibre business undergraduates from around the world who exhibit exceptional qualities and skills that fit the company's business culture.

- **Present Around the World Competition:** NTU undergraduate Liu Shiyu from the School of Mechanical and Aerospace Engineering became the first student from Singapore to win the top prize in this engineering competition. His design for a retractable roof that can be deployed in sports venues during bad weather was an idea borne out of his Undergraduate Research Experience on Campus project. Shiyu beat three other contestants, namely two professionals and a PhD candidate, to clinch the top prize.
- **Safety@Work Creative Awards:** Students from the School of Art, Design and Media made waves at the recent Safety@Work Creative Awards. Twins Henry and

Harry Zhuang were the recipients of the Gold Award in the Digital Animation category for their one-minute stop-motion animation entitled *Story About My Dad*. They are both scholars under the Media Development Authority's Media Education Scheme. Two other submissions from the School, one from Fung Chun Hong and Derwin Silamaya Suhali and the other from Goh Hui Ying, also received commendations for their creative efforts.

- **Yahoo! Mobile Developers Contest:** Team Simple from NTU took the top prize in this inaugural competition held in October 2008, beating 23 other teams. The team consisting of first-year Business and Computing Double Degree programme students Lim Jing-Yi, James Gwee Xue Qian and Tan Zhong Xing created a practical widget (mini application for mobile phones) that enables bank customers to use their mobile phones to locate branches and ATMs and access information on bank products. Their winning application was selected by



NTU wowed spectators with its magnificent float, *Draconika*, at the 2009 Chingay Parade

DBS Bank, one of the four corporate sponsors, for its simple interface; it also clinched the Best in Show title in the competition.

Achievements in Extracurricular Activities

NTU has a vibrant culture of sports, music, dance and community service. Our students are passionate about a host of interests and issues outside of academia. They have achieved success in many local events and competitions, proving their drive and determination in pursuing their passions.

- **Chingay Parade:** NTU made its debut at the 2009 Chingay Parade and wowed spectators with its magnificent float which represents the fusion of art and technology. During its maiden walk on the parade's route, it was backed by an energetic dance performance by some 100 students from NTU. The spectacular ensemble known as *Draconika* was voted Most Popular Float in an online voting competition organised by the People's

Association. It is a powerful expression of fantasy, form and creativity, and embodies the team spirit of the NTU community. The creation of *Draconika* was made possible by talents from the School of Mechanical and Aerospace Engineering and the School of Computer Engineering based on a concept drawing by students and faculty of the School of Art, Design and Media.

- **National Cheerleading Competition:** The NTU cheerleading teams clinched both the first and second positions at the National Cheerleading Competition on 22 March 2009. One of the teams, ACES White, retained the coveted Open category championship title for the fourth straight year. These victories clearly affirm NTU's cheerleading teams as *the* teams to beat in this exciting sport.
- **President's Social Service Award:** The Welfare Services Club received the President's Social Service Award from President S R Nathan at an awards ceremony at the

NTU has a vibrant culture of sports, music, dance and community service. Our students are passionate about a host of interests and issues outside of academia.

Istana on 27 November 2008. Conferred by the Office of the President of the Republic of Singapore, the award recognises outstanding voluntary contributions rendered to the social services sector and is the nation's most prestigious award for social service volunteerism. Besides this award, the Club has received other awards in the past.

- **Singapore Dragon Boat Festival:** The long hours of practice paid off for both the men's and women's teams from NTU. They defeated their competitors to clinch the Prime Minister's Cup Challenge Trophies at the Singapore Dragon Boat Festival on 28 June 2009.
- **Superband:** Tuzi, an all-girl band formed by NTU undergraduates Carissa Foo, Sarah Lam and Joyce Tan, emerged the winner in Superband, a local talent quest held in October 2008. Tuzi beat 15 other bands to win the top prize of \$50,000, becoming the first all-girl band to win the competition.

FACULTY/STAFF ACHIEVEMENTS

We congratulate our faculty who have received many accolades for their achievements:

- **Associate Professor Tamara Silvia Wagner from the School of Humanities and Social Sciences (HSS)** is the recipient of the inaugural Young Researcher Award for Social Science and the Humanities presented by the Conference of Asian University Presidents. The award is presented to young scholars based in Asia who have completed research of the highest academic calibre.
- **Professor Luke Kang Kwong from HSS** received the Outstanding Researcher Award for Excellence in Teaching and Research at the University of Hong Kong for his ground-breaking research in Chinese Linguistics. Professor Kang's research focuses on conversation analysis, corpus linguistics, natural language processing and cognitive neuroscience.
- **Dr Adrian Yeo Piah Song, Research Fellow from the School of Civil and Environmental Engineering (CEE),** is the winner of the inaugural Don Quixote Fund Award, which provides him with US\$100,000 in start-up capital to commercialise a novel invention, the *Membrane Integrity Sensor*. The Don Quixote Fund was set up in 2008 by Dr Andrew Benedek, the first winner of the Lee Kuan Yew Water Prize, to enable graduate students and early career scientists to develop high-risk innovative technology ideas that can potentially impact the water sector in the future.
- **Associate Professor Darren Sun Delai and his research team from CEE** received the Project Innovation Award from the International Water Association and the Engineering Achievement Award from the Institution of Engineers, Singapore, for their innovative use of nanotechnology to filter water effectively and efficiently. This home-grown technology has given a boost to Singapore's efforts to become an international water hub of the future.
- **Professor Henry Fan from CEE** is the recipient of the inaugural Singapore Aviation Academy (SAA) Fellows Award. Professor Fan was honoured for his academic standing in the international aviation community and the service he has rendered to SAA for the past 25 years, most notably his contribution towards developing the successful flagship Graduate Diploma in Airport Engineering, a joint programme between NTU and SAA.
- **Professor Ng Wun Jern from CEE,** who is also the Executive Director of Nanyang Environment and Water Research Institute, was awarded the inaugural Tan Chin Tuan Centennial Professorship for his contributions to environmental engineering research and education.
- **Associate Professor Ooi Kim Tiow and Research Associate Teh Yong Liang from the School of Mechanical and Aerospace Engineering** won the silver prize at the

We congratulate our faculty who have received many accolades for their achievements.



At the intersection of art and science – Dr Yang Huiying with her impression of a scenic mountain range using zinc-oxide nanoneedles

World's Best Technologies Showcase in Texas, USA. A panel of tech-commercialisation experts picked their cutting-edge invention, a revolving vane compressor, based on its potential to generate energy savings of US\$16 billion a year for heating, refrigeration and air conditioning systems.

- **Professor Krishna Palem, Director of NTU's Institute for Sustainable Nanoelectronics** and computer scientist at Rice University, USA, is the recipient of the 2008 W. Wallace Award for his pioneering contributions to the growing field of embedded computing. The award is the highest technical award presented by the Institute of Electrical and Electronic Engineering Computer Society and is one of the most prestigious individual honours in the computing world.
- **Associate Professor Indrajit Banerjee** from the Wee Kim Wee School of Communication and Information (WKWSCI) and **Dr Kalinga Seneviratne, Head of Research at the Asian Media Information and Communication Centre (AMIC)**, each received a publishing award at the

Asian Publishing Awards. Associate Professor Banerjee won the award for Best Book Published about the Media Industry in Asia category while Dr Seneviratne received the Excellence Award under the same category. Both books were jointly published by WKWSCI and AMIC.

- **Dr Yoga Divayana, Postdoctoral Fellow of Singapore Millennium Foundation**, received the 2008 IEEE Laser and Electro-optics Society Graduate Student Award for his outstanding technological innovation. Dr Divayana is the first Singapore-based graduate student to win the fellowship award since its inception in 1999.
- **Dr Yang Huiying, Lee Kuan Yew Postdoctoral Fellow**, took home the second prize in the Science as Art Competition in San Francisco. Her award-winning masterpiece using zinc-oxide nanoneedles to create an interesting close-up reminiscent of a scenic mountain range in China also won a prize in an NTU nano-art competition in 2006, and is one of the images featured in the 2008 NTU desktop calendar.

ALUMNI

BUILDING BRIDGES WITH ALUMNI

Academic Year (AY) 2008/2009 saw the largest graduating cohort from NTU, with 7,989 graduates in the Class of 2009. The figure expanded the University's growing number of alumni to 131,452, which includes graduates from over 100 countries across generations. We are continuing with our efforts to forge strong links with our alumni by increasing the level of alumni engagement through outreach programmes such as the Nanyang Alumni Awards, the Global Alumni Network, volunteering activities and integrated channels of communication.

Nanyang Alumni Awards

In AY2008/2009, the University conferred Nanyang Alumni Awards on 28 exceptional alumni, the highest number to date since the Awards were first given out in 2005. The Nanyang Alumni Awards are presented to outstanding alumni who have attained exemplary achievements in their areas of specialisation, or who have made significant contributions towards the betterment of the University, community or society. Embodying the University's efforts to perpetuate a culture of excellence, the Awards are presented in four categories.

- **Nanyang Distinguished Alumni Award**

This is the highest honour bestowed upon NTU alumni who have made their mark in their fields or professions in the local, regional or international arena. The recipients

of this distinguished award are Dr Ng Gek Boo and Dr Yang Quee Yee.

- **Dr Ng Gek Boo (Commerce, Class of 1969)**

Dr Ng is an exemplary humanitarian worker who is no stranger to the labour movement. He has proven his mettle time and again through his various appointments in the International Labour Organization (ILO). Dr Ng started out as an ILO Research Economist in Geneva. He was then appointed Director of Operations in the International Programme for the Elimination of Child Labour. As Director, he initiated several measures to prevent child trafficking, improve labour conditions for children who need to work, and eliminate the most brutal forms of child labour. During his appointment as ILO's Regional Director of Asia and the Pacific in 2006, Dr Ng worked with ASEAN member states to promote progressive labour practices.

- **Dr Yang Quee Yee (Arts, Class of 1960)**

Dr Yang is a renowned linguist who has dedicated his life to building bridges across Malay, Chinese and English cultural groups in the region through an impressive body of literary work. He was conferred the Honorary Doctor of Letters by the National University of Malaysia (Universiti Kebangsaan Malaysia) in recognition of his contributions to research on the Malay language. In Singapore, he

In AY2008/2009, the University conferred Nanyang Alumni Awards on 28 exceptional alumni, the highest number to date.



NTU's President, Dr Su Guanqing, launches the NTU Alumni Association (Jiangsu) on 8 March 2009 with its President, Mr Jiang Xinming

was the recipient of the Literary Award conferred by the Singapore Literary Association in 1993. Dr Yang has compiled a total of 12 dictionaries, among them a rare Malay-Chinese-English dictionary. One of his recent works is the compilation of *Kamus Umum Cina-Melayu Terkini*, a comprehensive Chinese-Malay dictionary.

- **Nanyang Alumni Achievement Award**

This category honours alumni who have gained national recognition for significant contributions in their fields or professions, or who have demonstrated extraordinary service, commitment and dedication towards the betterment of the University. The recipients of the award are:

- Associate Professor Chee Cheng Khee (Arts, Class of 1961)
- Dr Liang Wern Fook (NIE, Class of 1999)

- Mr Lim Sui Soon (MAE, Class of 1987)
- Mr Masagos Zulkifli bin Masagos Mohamad (EEE, Class of 1988)
- Professor Ong Choon Nam (Science, Class of 1972)
- Professor Tan Siah Kwee (Arts, Class of 1972)
- Mr Wu Hsioh Kwang (Commerce, Class of 1974)
- Ms Zuraidah binte Abdullah (CEE, Class of 1985)

- **Nanyang Outstanding Young Alumni Award**

In this category, alumni who are under the age of 40 are recognised for their endeavours in their fields or professions which have brought honour to the University. The award recipients are:

- Ms Bong Fui Lian, Shirley (NIE, Class of 1994)
- Mr Foo Chuan Yao, Harry (CEE, Class of 1997)
- Ms Lim Kim Hiok, Elsie (NBS, Class of 1997)

- Ms Lim Yean Hong, Nona (WKWSCl, Class of 1997)
- Ms Ng Hui (WKWSCl, Class of 2002)
- Mdm Parameswary d/o Sundar Rajoo (NIE, Class of 1997)
- Mr Siek Wei Ting, Ryan (NBS, Class of 1996)
- Mr Tan Chade Meng (SCE, Class of 1994)

- **Nanyang Alumni Service Award**

This award is presented to alumni who have demonstrated dedication and the spirit of volunteerism through the University's alumni clubs or associations, or other programmes or activities which have significantly enriched the University community. The award winners are:

- Er Chong Kee Sen (CEE, Class of 1987)
- Mr Koh Lian Huat (Commerce, Class of 1965)
- Mr Lee Ching Ping (SCE, Class of 1997)
- Mr Lim Yian Poh (Science, Class of 1969)
- Mr Ong Eng Bing (Commerce, Class of 1972)
- Mr Tan Ser Kwang (Science, Class of 1976)
- Mr Tan Yong Chuan, Andrew (NBS, Class of 2001)
- Ms Tay Swee Hoon (NBS, Class of 1990)
- Mr Wee Hui Kan (EEE, Class of 1987)
- Mr Yeo Tiong Eng (Commerce, Class of 1977)

Global Alumni Network

NTU saw a boost in the level of engagement with our local and overseas alumni through the establishment of more alumni associations both in Singapore and abroad.

Three new NTU alumni associations were set up, namely the NTU School of Biological Sciences Alumni Association,

NTU Anglers' Alumni Association and NTU Sports Club Alumni Association.

To expand NTU's global alumni network, seven alumni associations were formed in different provinces of China in Zhejiang, Jiangsu, Sichuan, Hunan, Fujian, Hong Kong SAR and Yunnan. With these new additions, NTU has 20 overseas alumni associations across China, India, Indonesia, Thailand, Vietnam and the United Kingdom as of 31 July 2009.

The University has also increased efforts to engage with its expanding number of international alumni based in Singapore. Four alumni gatherings were organised in the last academic year: NTU Indonesian Alumni Night (24 August 2008), NTU Malaysian Alumni Reunion (21 March 2009), NTU People's Republic of China Alumni Gathering (28 March 2009) and a broad-based alumni gathering held on 24 April 2009 attended by alumni from China, India, Malaysia, Myanmar, Nigeria, Pakistan, Thailand and Vietnam.

Volunteering Programmes

One of NTU's key alumni volunteer programmes, Class Agents, saw a boost in the number of class representatives appointed in AY2008/2009. By 31 July 2009, more than 1,000 Class Agents were appointed to serve as the vital link between their former classmates and NTU. They help to facilitate the updating of NTU's alumni database and promote participation in alumni activities. Class Agents are crucial in helping the University to stay in touch with its alumni.

Integrated Channels of Communication

We have put in place several initiatives to enhance the level of interaction with our alumni in the form of:

- **Online communication:** In addition to a monthly e-mail bulletin, NTU has introduced the Chinese alumni



Another great reunion to remember – The NTU Malaysian Alumni Reunion (Global Alumni Network)

website to promote our alumni activities. The e-initiative has been further enhanced by the setting up of a Facebook account, NTU Alumni Network, to facilitate group networking among our younger alumni.

- **Publications:** The University has increased the circulation of its alumni publications to reach out to more alumni. During the year, the quarterly alumni magazine, *NTULink*, reached a circulation of 100,000 readers while nearly 50,000 alumni worldwide subscribe to the monthly *ClassACT* e-zine.
- **Activities:** Around 50 wide-ranging activities were held during the year to promote alumni engagement. This included the first ConnectNANYANG Photography Competition, which saw keen interest from the whole University community. More than 800 alumni, students and faculty took part in the competition. Three photos, which vividly captured the defining moments of campus life, won the top cash prizes and were exhibited at the 2008 NTU Alumni Day.

A significant event held on 16 January 2009 was the Dialogue with NTU Alumni Associations, which saw presidents and committee members of the various NTU alumni associations coming together to share their experiences and exchange ideas in relation to organising events and activities.

Other regular activities organised for the alumni included class reunions, networking sessions, forums, trips and social gatherings. Participation in these events was encouraging with more alumni taking up the opportunity to reconnect with their friends and the University. In AY2008/2009, a total of 12,000 alumni participated in the alumni activities organised by the University.

BENEFACTORS



Singapore government officials and NTU dignitaries gracing the launch of the Chua Tian Poh Entrepreneurship Education Fund on 12 November 2008

BENEFACTORS CONTRIBUTING TO THE UNIVERSITY

In the financial year of 2008/2009, NTU received a total of \$74,675,417 (including government matching funds) from 7,753 gifts presented by foundations, individuals, alumni, graduating students, parents and friends. Despite the tough economic situation, the sum received exceeded that of the previous year by over \$2 million. Of special mention is the increase in the number of donors – 7,753 compared to 5,601 in the previous year. NTU is grateful to each donor, regardless of the sum received, as every gift goes towards accomplishing the University's ultimate goal of providing the highest quality education possible for our

students and supporting research and innovation for the betterment of society.

University benefactors and stakeholders are kept informed about developments at NTU through appreciation events and publications, including the bi-annual publication of the Development Office's newsletter, *ImpactNTU – Gifts in Action*. The newsletter highlights the far-reaching impact of gifts to the University that advance research, create knowledge and provide opportunities for financially disadvantaged students.

NTU's strong support network of benefactors and stakeholders share the University's passion for quality education.

Gifts from Foundations and Business Enterprises

During the year, NTU continued to receive strong support from major charitable organisations in Singapore such as the following:

- **Tan Chin Tuan Foundation:** The Foundation made an endowed gift of \$10 million to set up the Tan Chin Tuan Centennial Fund, which supports programmes in knowledge creation, academic excellence and building ties with key audiences. These include an endowed professorship in Engineering, faculty exchange fellowships and a centennial forum in China to engage with influential Chinese officials and leaders who graduated from the Master of Science in Managerial Economics and Master of Public Administration programmes, also popularly known as the Mayors' Class programmes.
- **Lien Foundation:** A gift of \$2 million completed the Foundation's pledge of \$3 million to set up the Lien Challenge. This is a competition which encourages radical environmental solutions for China's water and sanitation problems by engaging Chinese participants in the Mayors' Class programmes to search for innovative solutions and secure buy-in from strategic stakeholders in China.
- **Lee Foundation:** As in previous years, the Foundation continued with its strategic involvement in many aspects of NTU's academic efforts. Of special mention is the gift towards the University's debut participation in the 2009 Chingay parade. The project to build the float involved faculty, staff and students from diverse disciplines in the University. Named *Draconika*, the float won the Most Popular Float competition and will be displayed at the NTU Quadrangle until the end of the 2010 Youth Olympic Games.

- **Kwan Im Thong Hood Cho Temple:** The Temple stepped forward with its first gift of \$2 million to NTU to set up the Kwan Im Thong Hood Cho Temple Student Emergency Fund to assist students faced with financial difficulties.

Other gifts made came from:

- MacArthur Foundation, Ford Foundation and Sasakawa Peace Foundation to the S. Rajaratnam School of International Studies
- Citi Foundation to the National Institute of Education
- Tanlaw Foundation to the Wee Kim Wee School of Communication and Information

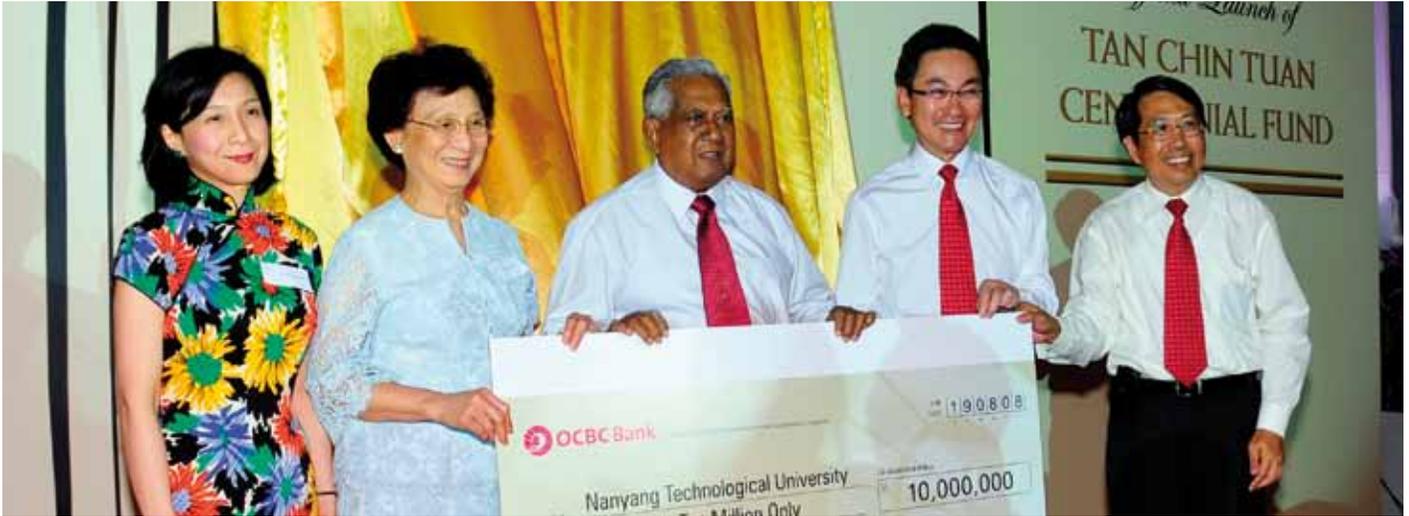
Local enterprises also contributed significantly to the total gifts received by NTU. These gifts are much appreciated as many small and medium-sized enterprises continued their philanthropic tradition of supporting education despite the challenges of last year's tough economic climate.

Gifts from Individuals

Although the economic downturn was expected to reduce the amount of individual giving, a significant number of individuals (including some who requested anonymity) came forward with their generous gifts. This is a testament to NTU's solid network of support from its benefactors and stakeholders who share the University's passion for quality education. Especially heartening is the strong support received for the Lim Chong Yah Bursary Fund, which was launched together with the Accessibility to Higher Education Campaign. The Campaign was endowed with a gift of over \$1.7 million from the estate of the late Foo Hee Lim. Since then, many more contributions from individuals and business organisations have been received, bringing the total sum raised to date to S\$5.2 million.



(From left) Mrs Margaret Lien, Chairman of the Lien Foundation, Singapore President S R Nathan and Dr Su Guaning, NTU President, at the commemoration of Lien Ying Chow Drive at the Yunnan Garden Campus



(From left) Ms Chew Gek Khim, Deputy Chair, Tan Chin Tuan Foundation; Dr Tan Kheng Lian, Chair, Tan Chin Tuan Foundation; Singapore President S R Nathan; Mr Koh Boon Hwee, Chair, NTU Board of Trustees and Dr Su Guanng, NTU President, at the launch of the Tan Chin Tuan Centennial Fund

Alumni Giving

A record number of alumni gave to the University last year, with over 5,600 individual gifts received. The year also saw a trend towards larger gifts from alumni. Close to 80 alumni made gifts of \$1,000 or more, with some alumni giving \$50,000 and above.

The year also saw a significant gift from three Nantah alumni – members of the family that owned the Shanghai Book Company. Their donation of S\$1 million went into setting up the Shanghai Book Company Scholarship and Bursary Fund. It awards up to four scholarships and 12 bursaries to students enrolled in the Bachelor of Arts (Hons) in Chinese programme at the School of Humanities and Social Sciences. The Fund also preserves the legacy of the Shanghai Book Company, founded in 1926, as Singapore's oldest wholesaler of literary books and publications in Chinese. Through its 83 years of history, the company played a critical role in the spread of Chinese literature in Singapore.

We are also grateful for the following funds that were set up through other generous alumni contributions:

- Dr Ho Ngiap Kum Bursary
- Mr Lim Cheng Eng Bursary Fund
- Ang Kim Soon Scholarship
- Columbia Investment Partners Scholarship

Graduation Class Gifts

The University's continuous efforts to nurture a giving mindset among our students also yielded results. The Graduation Giving Programme (iGave) encourages graduating students to make their first gift to NTU before they graduate. The year's tally of close to 3,000 gifts from the graduating class set a new record again, for the third straight year. The participation rate of 36.5% from the 2008 cohort is a significant increase from that of 27% in 2007, 21% in 2006 and 8% in 2005.

GIFTS TO THE UNIVERSITY

(April 2008 – March 2009)

S\$3 MILLION AND ABOVE

MacArthur Foundation

Temasek Foundation CLG Limited

The Tan Chin Tuan Foundation

S\$1 MILLION AND ABOVE

Estate of Foo Hee Lim

Goh Gaik Choo

Kwan Im Thong Hood Cho Temple

Lien Foundation

Lien Wen Hsien, Margaret

The Shanghai Book Co (Pte) Ltd

Anonymous

S\$100,000 AND ABOVE

Ancora Foundation

CapitaLand Limited

Citi Foundation

Ho Ngiap Kum

Jiangsu HuaiLong Materials Company Limited

Khoo Hock Tin

Kwek Leng Joo

Lee Foundation Singapore

Lim Cheng Eng

Pacific International Lines (Pte) Ltd

PowerSeraya Ltd

Sasakawa Peace Foundation Japan

Singapore Technologies Engineering Ltd

Tan Jushin, Kenneth

Tanlaw Foundation

The Ford Foundation

S\$25,000 AND ABOVE

8th PCEE Local Organising Committee

Ang Kim Soon

Cheung Shing Tai, John

Columbia Investment Partners Pte Ltd

EADS Deutschland GMBH

ExxonMobil Asia Pacific Pte Ltd

Furama Ltd

Global Objectives Ltd

Hewlett-Packard Singapore (Pte) Ltd

Ho Yeow Koon & Sons (Pte) Ltd

Institute of International Education

International Development Research Centre (SE & EA)

Koh Tai Ann

Ministry of Trade & Industry

National Environment Agency

Norden Shipping (Singapore) Pte Ltd

NTU Alumni Club

Ong Yee Cheok (*deceased*)

Oversea-Chinese Banking Corporation Ltd

Professional Engineers Board Singapore

PT Ancora International

Regency Steel Asia Pte Ltd

Renesas Technology Singapore Pte Ltd

SIF08 Conference Local Organising Committee

Singapore Shipping Association

Tan Ean Kiam Foundation

Tan Joo Kee Scholarship

The Rajabali Jumabhoy Foundation Ltd

The Shaw Foundation Pte

Vemala Rajamanickam

EMINENT VISITORS

(August 2008 – July 2009)



Mr Dave Hancock, Minister of Education, Alberta, Canada, with Dr Su Guaning, NTU President

NOBEL LAUREATES

Prof Gerard't Hooft

Nobel Laureate in Physics, 1999

Institute for Theoretical Physics

Universiteit Utrecht, Netherlands

Sir Anthony James Leggett

Nobel Laureate in Physics, 2003

John D. and Catherine T. MacArthur Professor

Center for Advanced Study Professor of Physics

University of Illinois at Urbana-Champaign, USA

Prof Barry J. Marshall

Nobel Laureate in Physiology, 2005
University of Western Australia, Australia

Prof Douglas D. Osheroff

Nobel Laureate in Physics, 1996
Professor of Physics and Applied Physics
Stanford University, USA

Prof Martin Lewis Perl

Nobel Laureate in Physics, 1995
Professor (Emeritus)
*Stanford Linear Accelerator Center
Stanford University, USA*

Prof Kurt Wüthrich

Nobel Laureate in Chemistry, 2002
Professor of Biophysics
*Swiss Federal Institute of Technology
(ETH) Zürich, Switzerland*

LEE KUAN YEW DISTINGUISHED VISITORS

Prof James Barber

Lee Kuan Yew Distinguished Visitor
Imperial College London, UK

Prof Shu Chien

Lee Kuan Yew Distinguished Visitor
Y.C. Fung Professor of Bioengineering and Medicine
University of California, San Diego, USA

TAN KAH KEE PROFESSORS

Prof Chang Ngee Pong

Nanyang Professor, NTU
Professor of Physics
City College, City University of New York, USA

Prof Steven Schachter

Director of Research
Professor of Neurology
Harvard Medical School, USA

OTHER EMINENT VISITORS

Sir Roy M. Anderson

Rector
Professor of Infectious Disease Epidemiology
Imperial College London, UK

Mr Norman R. Augustine

Member of US Homeland Security Advisory Council
Former Member of the US President's Council of
Advisors on Science & Technology
Ex-Chairman, Chairman and CEO of *Lockheed Martin*

Prof Allen J. Bard

Hackerman-Welch Regents Chair in Chemistry
University of Texas at Austin, USA

Mr Jan Björklund

Minister for Education
Ministry of Education and Research, Sweden

Prof Douwe D. Breimer

Professor of Pharmacology
Former Rector Magnificus and President
Leiden University, Netherlands

Prof Brian Cantor

Vice-Chancellor
University of York, UK

Prof G.K. Chadha

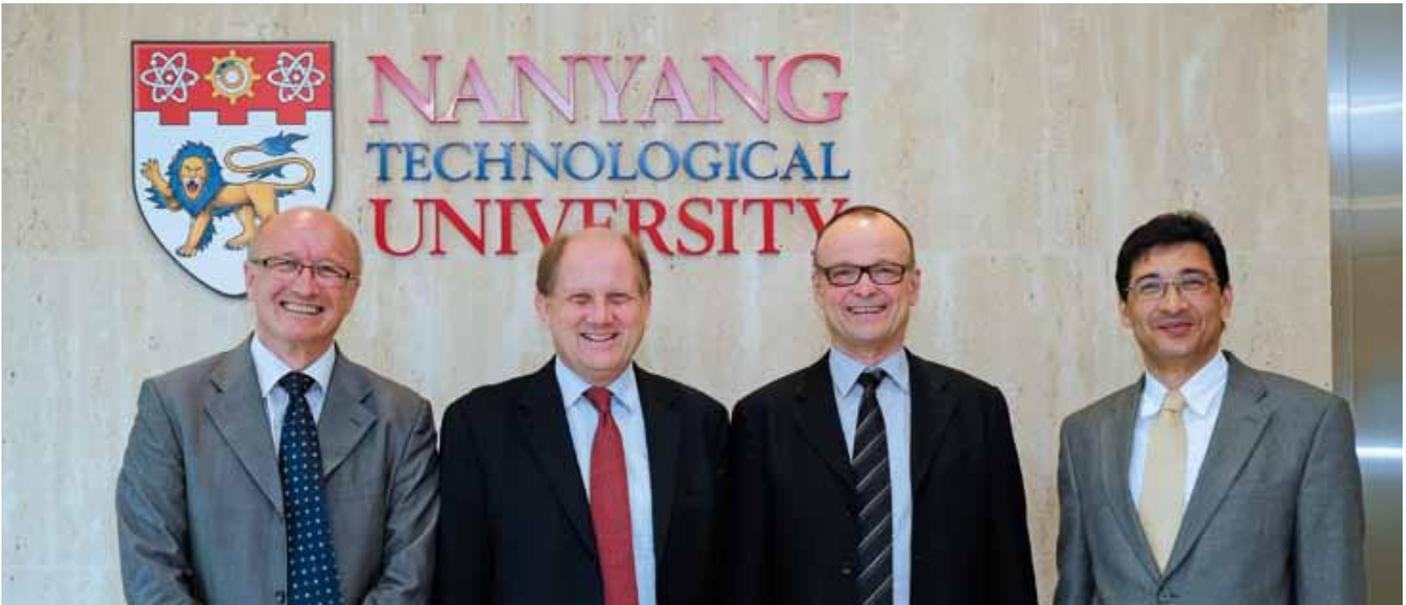
Chief Executive Officer
South Asian University, New Delhi, India

Prof Tommy Yung-Chi Cheng

Henry Bronson Professor of Pharmacology
Yale University School of Medicine, USA

Mr Evgeny V. Chuprunov

Rector
*N. I. Lobachevsky State University of
Nizhni Novgorod, Russia*



(From left) Prof Jens Petter Tøndel, Executive Vice-President, BI Norwegian School of Management; Prof Bertil Andersson, NTU Provost; Prof Tom Colbjørnsen, President, BI Norwegian School of Management; and Assoc Prof Nilanjan Sen, Assoc Dean, Nanyang Business School

Prof Tom Colbjørnsen

President

BI Norwegian School of Management, Norway

Prof Leticia F. Cugliandolo

Director

Ecole de Physique des Houches, France

Dr Siegfried Dais

Deputy Chairman, Board of Management

Robert Bosch GmbH, Germany

Prof Feng Da-Hsuan

Senior Executive Vice-President

National Cheng Kung University, Taiwan

Prof Alistair Fitt

Pro Vice-Chancellor

University of Southampton, UK

Mr Dave Hancock

Minister of Education and Government House Leader

Province of Alberta, Canada

Prof Harriet Wallberg-Henriksson

President

Karolinska Institutet, Sweden

Prof Richard Herman

Chancellor

University of Illinois at Urbana-Champaign, USA

Prof Marita Hilliges

Pro Vice-Chancellor

Halmstad University, Sweden

Prof Kerson Huang

Professor of Physics Emeritus

Massachusetts Institute of Technology, USA

H.E. Dr Jamil Mahmoud Mohamed Merdad
Ambassador of the Kingdom of Saudi Arabia
Royal Embassy of Saudi Arabia, Singapore

Prof Mannar Jawahar
Vice-Chancellor
Anna University, Chennai, India

Dr Seung Tae Kim
President
Anyang University, South Korea

Dr Steven Knapp
President
George Washington University, USA

Prof Wolfgang Krautschneider
Head, Institute of Nanoelectronics
Hamburg University of Technology, Germany

Prof Lee Lou Chang
Minister
National Science Council, Taiwan

Prof Christian Lerminiaux
President/ Vice-Chancellor
University of Technology of Troyes (UTT), France

Mr Marten Lindström
Chairman, Industrial Research Committee
Royal Swedish Academy of Engineering Sciences (IVA), Sweden

Prof Richard K. Lyons
Dean, Haas School of Business
University of California, Berkeley, USA

Prof Steven W. McLaughlin
Vice-Provost for International Initiatives
Ken Byers Professor
*School of Electrical and Computer Engineering
Georgia Institute of Technology, USA*

Dr Hermann Mettler
President
*University of Applied Sciences (HSR),
Rapperswil, Switzerland*

Prof Alan Robson
Vice-Chancellor
University of Western Australia, Australia

Prof Leonard H. Rome
Associate Director and Professor, Biological Chemistry
*California NanoSystems Institute
University of California, Los Angeles, USA*

Dr Carl J. Schramm
President and Chief Executive Officer
Kauffman Foundation, USA

Prof Saeed Sohbrabpour
President
Sharif University of Technology, Tehran, Iran

Prof Satish K. Tripathi
Provost and Executive Vice-President for
Academic Affairs
State University of New York at Buffalo, USA

Mr Bruce Wands
Chair, MFA Computer Art
Director of Computer Education
School of Visual Arts, New York, USA

Mr Lyonpo Dorji Wangdi
Minister
Ministry of Labour and Human Resources, Bhutan

Prof Yin Jie
Vice-President
Shanghai Jiao Tong University, China

MILESTONES

(August 2008 – July 2009)

AUGUST 2008

- NTU is chosen as the official Games Village for the world's inaugural Youth Olympic Games to be held in 2010.
- The Nanyang President's Graduate Scholarship is launched to encourage outstanding graduates and final-year students to take up research careers through PhD studies at NTU.
- The inaugural assembly of NTU's Senate marks a new milestone in the governance of university affairs.

OCTOBER 2008

- The NTU Art and Heritage Museum is officially opened.

DECEMBER 2008

- NTU partners with the Ewing Marion Kauffman Foundation to establish Asia's first Kauffman Campus.
- A key road at NTU is named the Lien Ying Chow Drive in honour of the late Dr Lien Ying Chow, to recognise his past contributions and the strong ties between the University and the Lien Foundation.

JANUARY 2009

- The Nanyang Business School's MBA programme is ranked 24th in the Global MBA Rankings by the Financial Times, marking the first time a Singapore university's MBA programme makes it to the top 25.

FEBRUARY 2009

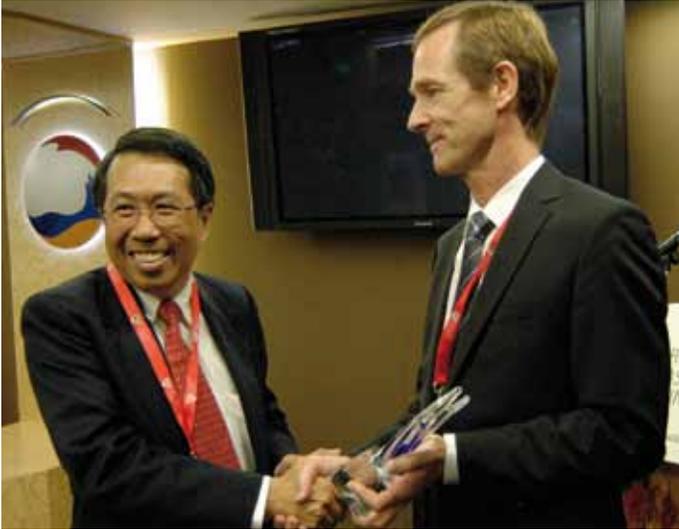
- The Institute for Sustainable Nanoelectronics designs and builds the world's first microchip that runs seven times faster and uses 30 times less energy than existing technologies.
- NTU launches the Bachelor of Science programme in Sport Science and Management, the only degree programme in Singapore that offers undergraduates academic and professional pathways to sports-related careers.
- The Earth Observatory of Singapore, the nation's first Research Centre of Excellence dedicated to the study of earth sciences, officially opens.

MARCH 2009

- The School of Mechanical and Aerospace Engineering wins the 2009 Aerospace Academic Institution of the Year award at the Frost & Sullivan Asia Pacific Aerospace and Defense Awards.

APRIL 2009

- NTU is one of the seven founding members of the Global Alliance of Technological Universities, a network of the world's top technological universities that seeks to address global issues through cutting-edge science and technology research.
- The award-winning building of the School of Art, Design and Media officially opens.



Dr Su Guaning, NTU President, and Prof Kerry Sieh, Director of the Earth Observatory of Singapore (EOS), at the official opening of EOS

- NTU receives the Excellence in Training Development award at the Singapore International Maritime Awards, the first institution of higher learning to do so.
- NTU and Imperial College London sign an agreement to establish joint PhD programmes in engineering and science.
- NTU launches a new Master of Science programme in Systems and Project Management, with an option for a Dual Master's programme with Stevens Institute of Technology, USA.

MAY 2009

- The Energy Research Institute at NTU (ERI@N) is launched to address complex global energy challenges.
- NTU launches a new alumni chapter in Sichuan, China.

JUNE 2009

- NTU and Technische Universität München implement a joint Master of Science programme in Aerospace Engineering, the first of its kind in Singapore.



Prof Bertil Andersson, NTU Provost, and Mrs Maria Grazia Mazzocchi, Domus Academy President, signing an MOU to formalise the NTU-Domus Academy joint Master's programme

- A new alumni chapter is launched in Hunan, bringing the total number of alumni associations in China to 12.

JULY 2009

- NTU collaborates with Domus Academy to offer a joint Master of Arts programme in Interactive Design. This is the first time the top Italian design school is partnering a foreign university to establish a Master's programme outside of Italy.
- The new School of Physical and Mathematical Sciences building is officially opened as a focal point for innovative research and education in science.
- NTU celebrates the graduation of the Class of 2009, its largest graduating cohort to date. The 7,989 graduates include the pioneer classes from the School of Art, Design and Media, the School of Humanities and Social Sciences, and the School of Physical and Mathematical Sciences.

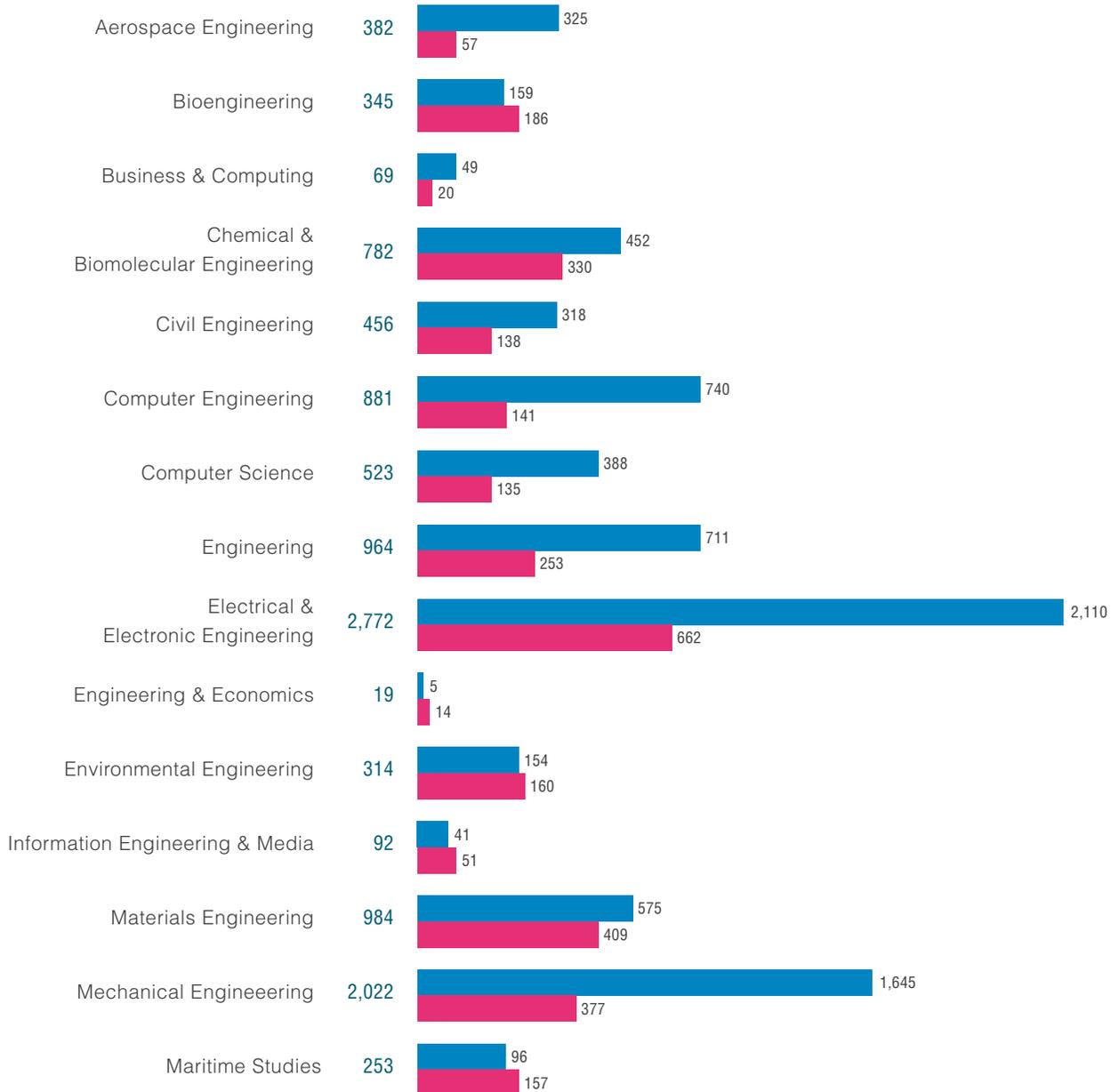
FACTS AND FIGURES

ENROLMENT

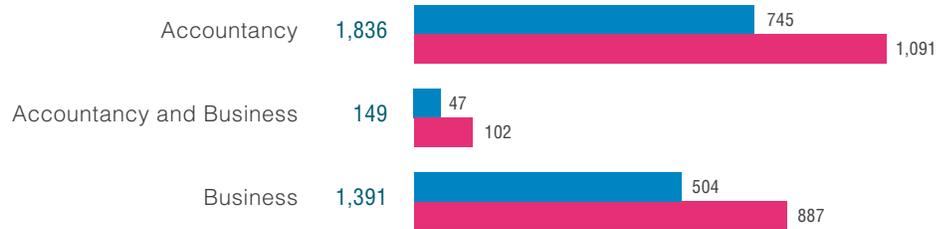
AY 08/09 UNDERGRADUATE ENROLMENT BY PROGRAMME & GENDER¹

■ Male ■ Female

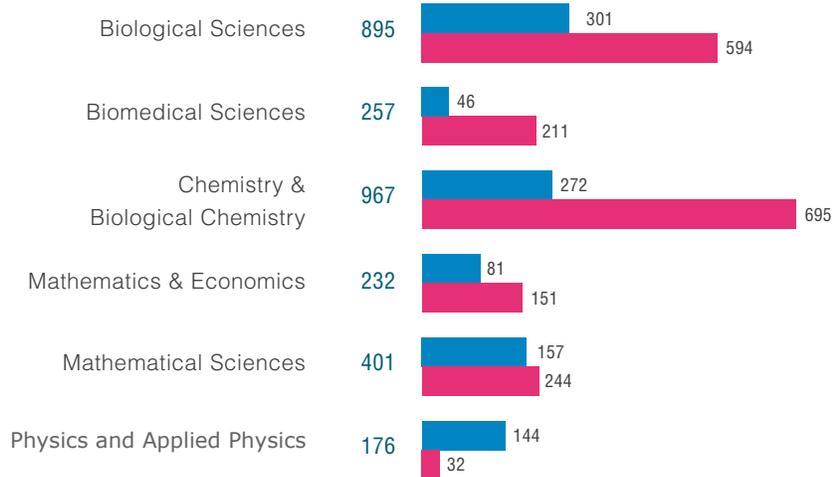
College of Engineering



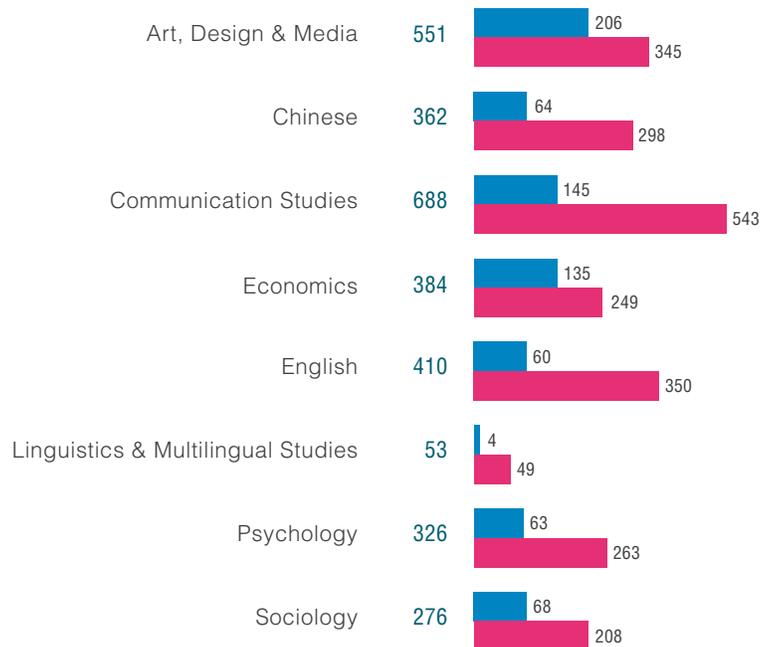
College of Business (Nanyang Business School)



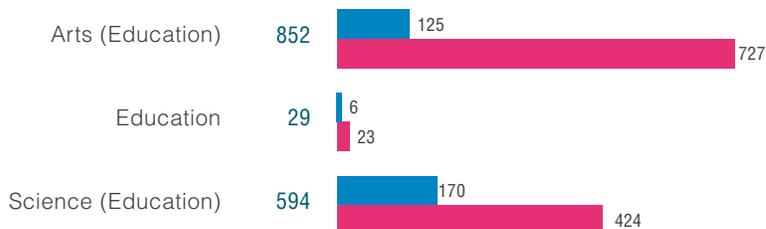
College of Science



College of Humanities, Arts, & Social Sciences



National Institute of Education



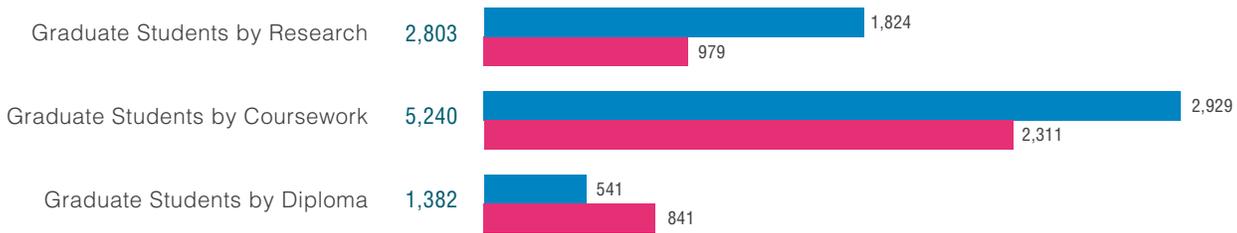
Total Male Undergraduates 11,111
Total Female Undergraduates 10,576
Total Undergraduates 21,687

¹ Student figures as at 1 September 2008

ENROLMENT

AY 08/09 GRADUATE ENROLMENT BY PROGRAMME & GENDER¹

■ Male ■ Female

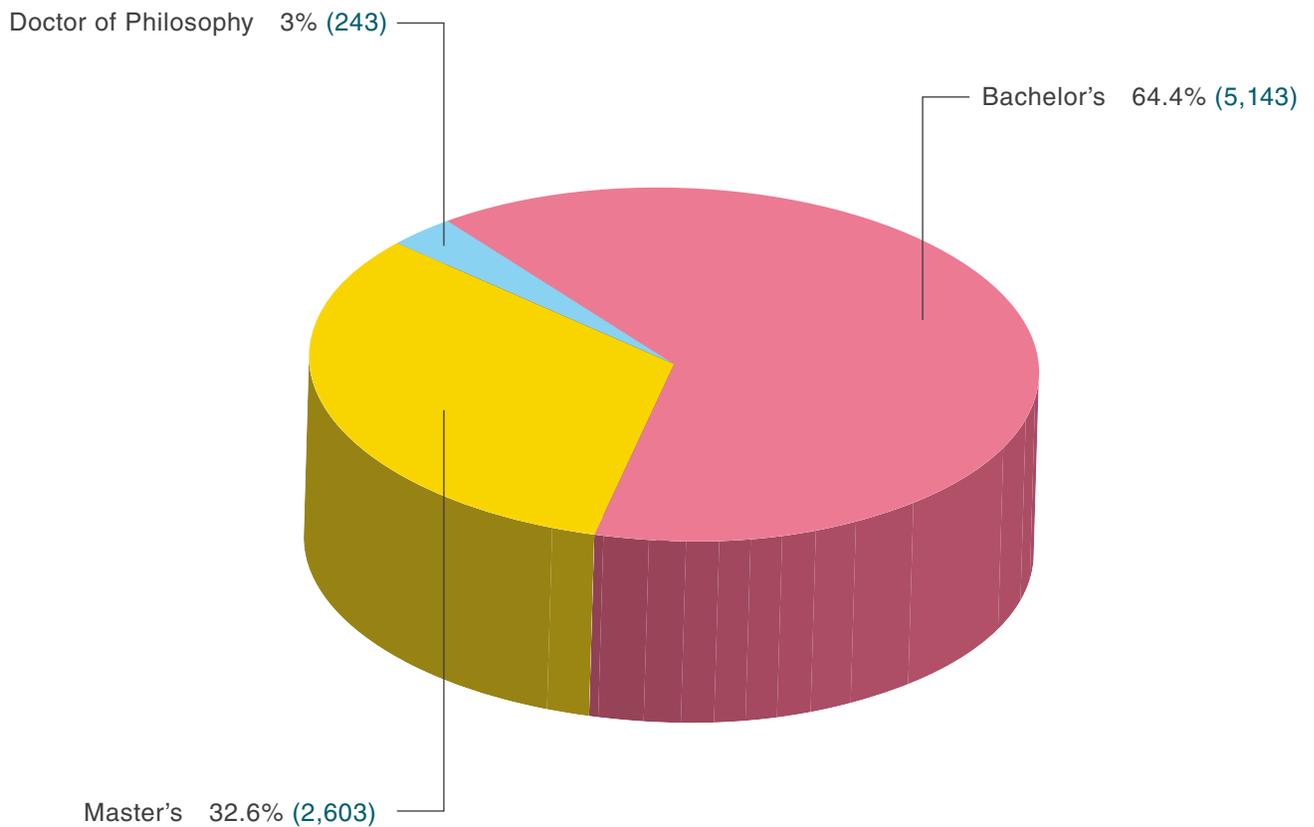


Total Male Graduate Students 5,294
 Total Female Graduate Students 4,131
 Total Graduate Students 9,425

¹ Graduate student figures as at 1 September 2008

GRADUATE

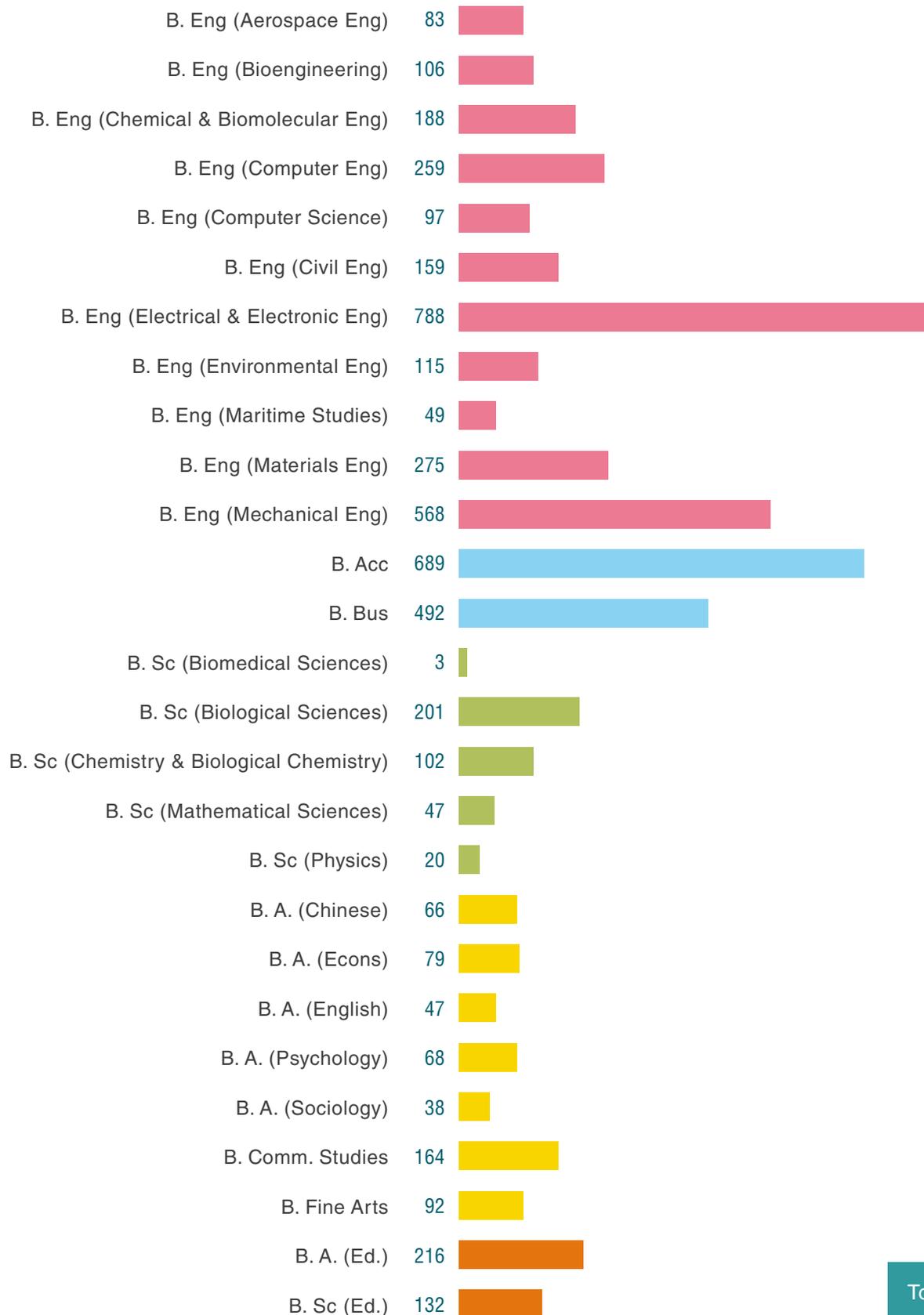
AY 08/09 GRADUATES BY TYPE OF DEGREE & PROGRAMME²



Total Graduates 7,989

² Graduate figures as at 7 September 2009

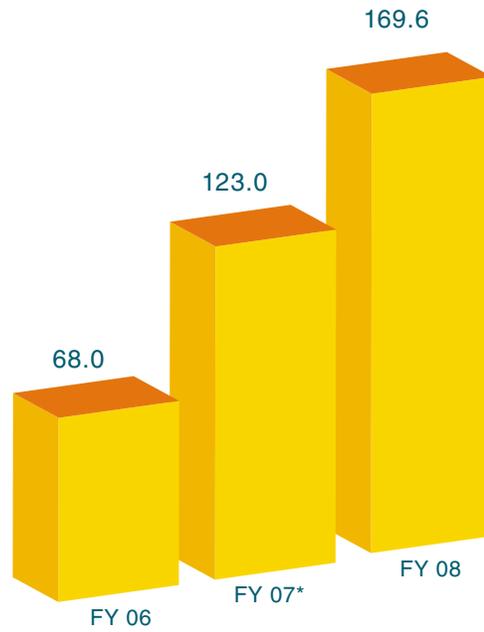
Graduates of Bachelor's Degrees



Total 5,143

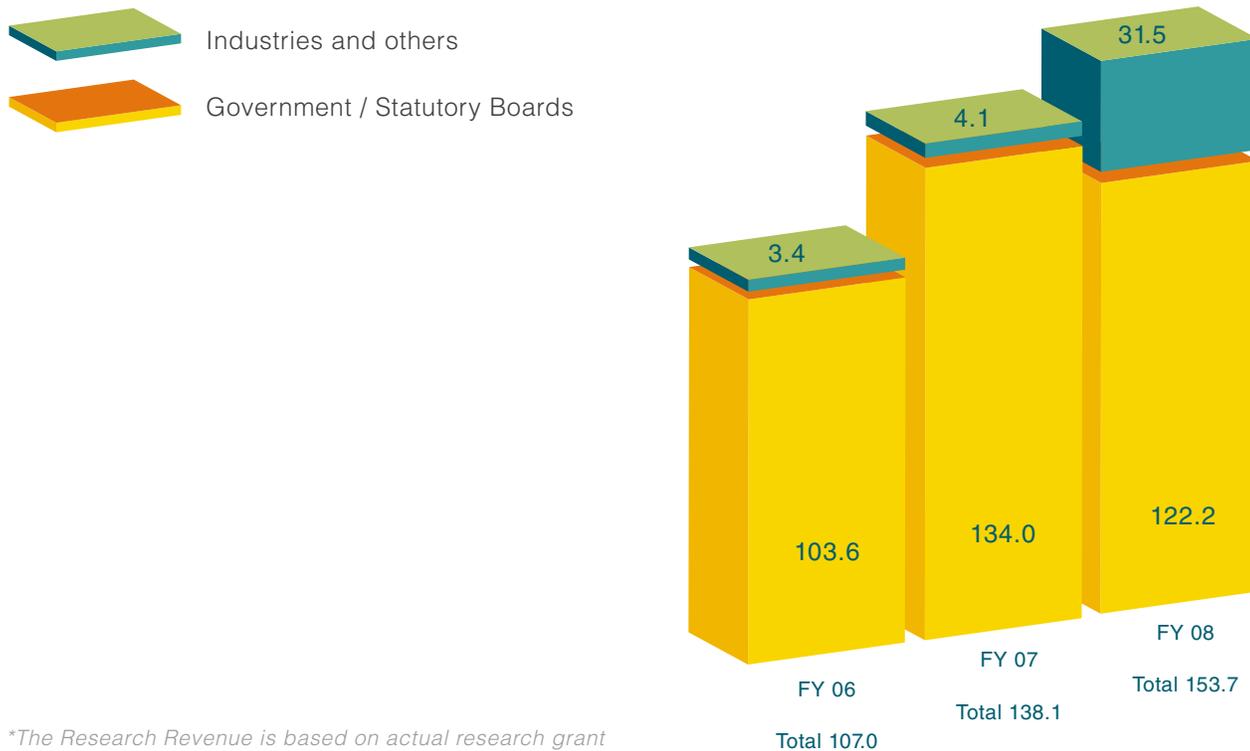
RESEARCH

COMPETITIVE RESEARCH GRANTS AWARDED (\$M)



*FY07 figure excludes \$150m for Earth Observatory of Singapore

RESEARCH REVENUE* (\$M)

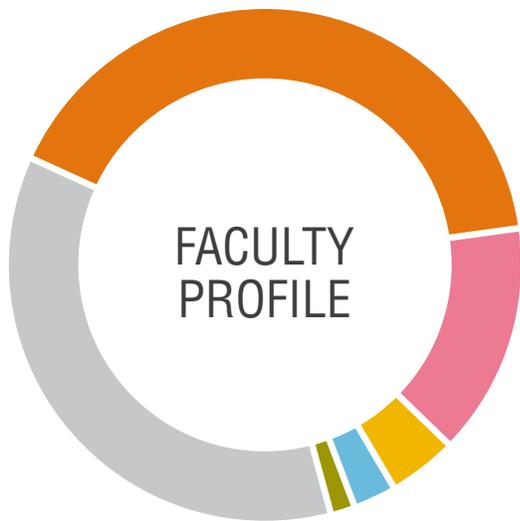


*The Research Revenue is based on actual research grant received for the Financial Year (FY).

OUR PEOPLE
EMPLOYEE PROFILE AND FACULTY PROFILE



- Faculty - 1,142
- Research Staff - 1,095
- Management Staff - 540
- Support Staff - 1,388



- Professor - 102
- Associate Professor - 461
- Assistant Professor - 381
- Lecturer - 67
- Visiting Faculty - 92
- Others - 39

*Our faculty members come from 55 countries
 Above figures are as at 31 March 2009 (excludes Adjunct faculty)*



The new home of the College of Humanities, Arts, & Social Sciences

FINANCIAL STATEMENTS



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Independent Auditors' Report	75
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Consolidated Income and Expenditure Statement	79
Statement of Changes in Funds and Reserves	81
Consolidated Cash Flows Statement	83

*The full audited financial report can be viewed at the University's website:
http://www.ntu.edu.sg/AboutNTU/Documents/NTU_Financial_Statements_Yr_ended_31_Mar_09.pdf*

The financial statements as set out on pages 72 to 84 do not contain the Notes to the financial statements.

REPORT OF TRUSTEES

YEAR ENDED 31 MARCH 2009

The Board of Trustees present their report to the members together with the audited financial statements of Nanyang Technological University (the University Company) for the financial year ended 31 March 2009.

Trustees

The Trustees in office at the date of this report are as follows:

Mr Koh Boon Hwee (Chairman)	Ms Lien Siaou-Sze
Mr Alwi Bin Abdul Hafiz	Mr Michael Lim Choo San
Mr Chia Ban Seng	Mr Lim Chuan Poh
Ms Jennie Chua	Prof Haresh Shah
Mr Goh Geok Ling	Mr Inderjit Singh
Dr Robert J. Herbold	Mr Tan Lip Bu
Mr Kwek Leng Joo	Mr Ernest Wong
Mrs Lee Suet Fern	Mr Edmund Cheng
Mrs Tan Ching Yee	Dr Su Guaning

Arrangements to Enable Trustees to Acquire Shares and Debentures

Neither at the end of nor at any time during the financial year was the University Company a party to any arrangement whose object was to enable the Trustees of the University Company to acquire benefits by means of the acquisition of shares in, or debentures of, the University Company or any other body corporate.

Trustees' Interests

As the University Company is limited by guarantee, there are no matters to be disclosed under Section 201(6)(f) and (g), Section 201(6A)(g) and (h), Section 201(11) and Section 201(12) of the Singapore Companies Act, Chapter 50.

Trustee Contractual Benefits

Since the end of the previous financial year, no Trustee has received or become entitled to receive a benefit by reason of a contract made by the University Company or a related corporation with the Trustee or with a firm of which he is a member or with a company in which he has a substantial financial interest, except as disclosed in Note 26 to the financial statements.

Auditors

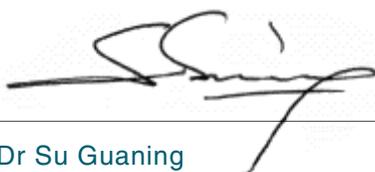
The auditors, KPMG LLP, have indicated their willingness to accept re-appointment.

On behalf of the Board of Trustees



Mr Koh Boon Hwee

Trustee



Dr Su Guanng

Trustee

14 July 2009

STATEMENT BY TRUSTEES

In our opinion:

- (a) the financial statements set out on pages 77 to 84 are drawn up so as to give a true and fair view of the state of affairs of the Group and the University Company as at 31 March 2009, and the results, changes in funds and reserves and cash flows of the Group and of the changes in funds and reserves of the University Company for the year then ended on that date in accordance with the provisions of the Singapore Companies Act, Chapter 50 and Singapore Financial Reporting Standards; and
- (b) at the date of this statement, there are reasonable grounds to believe that the University Company will be able to pay its debts as and when they fall due.

The Board of Trustees has, on the date of this statement, authorised these financial statements for issue.

On behalf of the Board of Trustees



Mr Koh Boon Hwee

Trustee



Dr Su Guanng

Trustee

14 July 2009

INDEPENDENT AUDITORS' REPORT

Members of the University Company
Nanyang Technological University

We have audited the accompanying financial statements of Nanyang Technological University (the University Company) and its subsidiaries (collectively the Group), which comprise the balance sheets of the Group and the University Company as at 31 March 2009, and the income and expenditure statement, statements of changes in funds and reserves and statement of cash flows of the Group and the statement of changes in funds and reserves of the University Company for the year then ended and a summary of significant accounting policies and other explanatory notes, as set out on pages 77 to 84.

Management's responsibility for the financial statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with the provisions of the Singapore Companies Act, Chapter 50 (the Act) and Singapore Financial Reporting Standards. Management has acknowledged that its responsibility includes:

- (a) devising and maintaining a system of internal accounting controls sufficient to provide a reasonable assurance that assets are safeguarded against loss from unauthorised use or disposition; and transactions are properly authorised and that they are recorded as necessary to permit the preparation of true and fair profit and loss accounts and balance sheets and to maintain accountability of assets;
- (b) selecting and applying appropriate accounting policies; and
- (c) making accounting estimates that are reasonable in the circumstances.

Auditors' responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Singapore Standards on Auditing. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit includes performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion:

- (a) the consolidated financial statements of the Group and the balance sheet and statement of changes in funds and reserves of the University Company are properly drawn up in accordance with the provisions of the Act and Singapore Financial Reporting Standards to give a true and fair view of the state of affairs of the Group and of the University Company as at 31 March 2009 and the results, changes in funds and reserves and cash flows of the Group and changes in funds and reserves of the University Company for the year ended on that date; and
- (b) the accounting and other records required by the Act to be kept by the University Company, have been properly kept in accordance with the provisions of the Act.

KPMG LLP

KPMG LLP

Public Accountants and
Certified Public Accountants

Singapore
14 July 2009

BALANCE SHEETS

AS AT 31 MARCH 2009

		Group		University Company	
	Note	2009	2008	2009	2008
		\$'000	\$'000	\$'000	\$'000
Non-current Assets					
Property, plant and equipment	3	1,273,263	1,302,977	1,272,791	1,302,460
Prepaid lease	4	3,931	4,097	3,931	4,097
Subsidiaries	5	-	-	291	291
Available-for-sale financial assets		1,299	2,845	-	-
Student loans	8	8,575	19,412	8,575	19,412
Finance lease receivables	9	23,280	24,430	23,280	24,430
		1,310,348	1,353,761	1,308,868	1,350,690
Current assets					
Derivative financial instruments	7	278	5,483	278	5,483
Student loans	8	5,759	4,288	5,759	4,288
Trade and other receivables	11	208,081	168,230	207,235	167,985
Financial assets at fair value through income and expenditure	6	548,857	1,053,805	548,857	1,053,805
Finance lease receivables	9	1,150	388	1,150	388
Cash and cash equivalents	12	867,031	477,962	863,209	474,415
		1,631,156	1,710,156	1,626,488	1,706,364
Total assets		2,941,504	3,063,917	2,935,356	3,057,054
Current liabilities					
Derivative financial instruments	7	3,628	436	3,628	436
Trade and other payables	13	120,227	118,483	119,014	116,140
Grant received in advance – IT and F&E	10	26,393	12,202	26,382	12,202
Short-term borrowings	14	172,000	124,000	172,000	124,000
Deferred tuition and other fees		50,137	47,814	50,137	47,814
Research grants received in advance	15	49,395	56,225	49,395	56,225
		421,780	359,160	420,556	356,817

BALANCE SHEETS

AS AT 31 MARCH 2009

		Group		University Company	
	Note	2009	2008	2009	2008
		\$'000	\$'000	\$'000	\$'000
Non-Current Liabilities					
Deferred capital grants	16	882,085	962,724	882,064	962,724
Other non-current liabilities		2,297	1,770	2,297	1,770
Sinking fund received in advance	10	99,970	73,763	99,970	73,763
		984,352	1,038,257	984,331	1,038,257
Total liabilities		1,406,132	1,397,417	1,404,887	1,395,074
Net assets		1,535,372	1,666,500	1,530,469	1,661,980
Capital account	18	200,858	200,858	200,858	200,858
Accumulated surplus					
- General fund		294,621	271,295	289,862	266,919
- Endowment fund	19	719,788	907,184	719,788	907,184
- Other restricted fund		320,105	287,163	319,961	287,019
Funds and reserves		1,535,372	1,666,500	1,530,469	1,661,980
Funds managed on behalf of the Ministry	17	191,582	178,920	191,582	178,920
Funds' net assets managed on behalf of the Ministry	17	(191,582)	(178,920)	(191,582)	(178,920)

CONSOLIDATED INCOME AND EXPENDITURE STATEMENT

YEAR ENDED 31 MARCH 2009

	Note	General fund		Endowment fund		Other restricted fund		Total	
		2009	2008	2009	2008	2009	2008	2009	2008
		\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000	\$'000
GROUP									
Income									
Tuition and other fees		178,482	153,420	-	-	23,402	19,467	201,884	172,887
Rental income		2,280	2,104	-	-	27,845	26,079	30,125	28,183
Research grants	15	128,947	124,489	-	-	-	-	128,947	124,489
Interest income	20	4,152	8,215	218	303	876	1,562	5,246	10,080
Donations		-	-	25,103	28,655	24,143	15,928	49,246	44,583
Other grants		3,124	1,714	-	-	5,117	8,472	8,241	10,186
Sundry income		7,239	7,656	-	-	40,441	30,548	47,680	38,204
Deferred capital grants amortised (non-ministry)	16	8,313	7,688	-	-	3,308	3,201	11,621	10,889
		332,537	305,286	25,321	28,958	125,132	105,257	482,990	439,501
Expenditure									
Expenditure on manpower		485,269	474,660	749	849	35,809	30,656	521,827	506,165
Teaching/Research		86,590	77,762	-	-	20,814	17,688	107,404	95,450
Administration		54,077	39,059	-	-	31,341	30,943	85,418	70,002
Maintenance		61,419	46,487	-	-	12,748	9,234	74,167	55,721
Library books and periodicals		8,051	7,670	-	-	-	-	8,051	7,670
Depreciation of property, plant and equipment	3	148,689	143,434	-	-	4,867	4,905	153,556	148,339
Amortisation of prepaid lease	4	166	166	-	-	-	-	166	166
Balance carried forward		844,261	789,238	749	849	105,579	93,426	950,589	883,513

CONSOLIDATED INCOME AND EXPENDITURE STATEMENT

YEAR ENDED 31 MARCH 2009

	Note	General fund		Endowment fund		Other restricted fund		Total	
		2009 \$'000	2008 \$'000	2009 \$'000	2008 \$'000	2009 \$'000	2008 \$'000	2009 \$'000	2008 \$'000
GROUP									
Balance brought forward		844,261	789,238	749	849	105,579	93,426	950,589	883,513
Capital expenditure not capitalised		17,551	16,361	-	-	474	129	18,025	16,490
Loss on disposal of property, plant and equipment		946	2,975	-	-	2	5	948	2,980
Loss on investments	21	59,279	7,930	215,765	26,690	892	125	275,936	34,745
Other expenses		718	506	3,994	5,249	52,849	44,958	57,561	50,713
		922,755	817,010	220,508	32,788	159,796	138,643	1,303,059	988,441
Deficit before grants from ministries	22	(590,218)	(511,724)	(195,187)	(3,830)	(34,664)	(33,386)	(820,069)	(548,940)
Development grants	10	18,212	17,008	-	-	-	-	18,212	17,008
Operating grants	23	451,353	387,709	-	-	-	-	451,353	387,709
Other grants		5	17	33,740	22,305	46,475	37,355	80,220	59,677
Deferred capital grants amortised	16	140,537	138,530	-	-	80	61	140,617	138,591
Surplus/(Deficit) after grants from ministries		19,889	31,540	(161,447)	18,475	11,891	4,030	(129,667)	54,045
Taxation	24	-	-	-	-	-	-	-	-
Surplus/(Deficit) for the year		19,889	31,540	(161,447)	18,475	11,891	4,030	(129,667)	54,045

STATEMENT OF CHANGES IN FUNDS AND RESERVES

YEAR ENDED 31 MARCH 2009

	←----- Accumulated surplus -----→				Total
	Capital account	General fund	Endowment fund	Other restricted fund	
Group	\$'000	\$'000	\$'000	\$'000	\$'000
At 1 April 2007	200,858	245,368	914,443	252,344	1,613,013
Surplus for the year	-	31,540	18,475	4,030	
Transfer from endowment fund	-	25,500	(25,734)	234	
Transfer to research grants received in advance	-	(641)	-	-	
Transfer to deferred capital grants	-	(175)	-	-	
Utilisation of other restricted fund/ general fund	-	(12)	-	(52)	
Transfer to other restricted fund	-	(30,328)	-	30,328	
Fair value adjustment	-	43	-	279	
At 31 March 2008	200,858	271,295	907,184	287,163	1,666,500
At 1 April 2008	200,858	271,295	907,184	287,163	1,666,500
Surplus/(Deficit) for the year	-	19,889	(161,447)	11,891	
Transfer from endowment fund	-	23,820	(25,949)	2,129	
Transfer to research grants received in advance	-	(1,193)	-	-	
Transfer to deferred capital grants	-	(388)	-	-	
Utilisation of other restricted fund/ general fund	-	12	-	(822)	
Transfer to other restricted fund	-	(20,931)	-	20,931	
Transfer to general fund	-	2,049	-	(2,049)	
Fair value adjustment	-	68	-	862	
At 31 March 2009	200,858	294,621	719,788	320,105	1,535,372

STATEMENT OF CHANGES IN FUNDS AND RESERVES

YEAR ENDED 31 MARCH 2009

	←----- Accumulated surplus -----→				Total
	Capital account	General fund	Endowment fund	Other restricted fund	
	\$'000	\$'000	\$'000	\$'000	\$'000
University Company					
At 1 April 2007	200,858	242,946	914,443	252,344	1,610,591
Surplus for the year	-	29,586	18,475	3,886	
Transfer from endowment fund	-	25,500	(25,734)	234	
Transfer to research grants received in advance	-	(641)	-	-	
Transfer to deferred capital grants	-	(175)	-	-	
Utilisation of other restricted fund/ general fund	-	(12)	-	(52)	
Transfer to other restricted fund	-	(30,328)	-	30,328	
Fair value adjustment	-	43	-	279	
At 31 March 2008	200,858	266,919	907,184	287,019	1,661,980
At 1 April 2008	200,858	266,919	907,184	287,019	1,661,980
Surplus/(Deficit) for the year	-	19,506	(161,447)	11,891	
Transfer from endowment fund	-	23,820	(25,949)	2,129	
Transfer to research grants received in advance	-	(1,193)	-	-	
Transfer to deferred capital grants	-	(388)	-	-	
Utilisation of other restricted fund/ general fund	-	12	-	(822)	
Transfer to other restricted fund	-	(20,931)	-	20,931	
Transfer to general fund	-	2,049	-	(2,049)	
Fair value adjustment	-	68	-	862	
At 31 March 2009	200,858	289,862	719,788	319,961	1,530,469

CONSOLIDATED CASH FLOWS STATEMENT

YEAR ENDED 31 MARCH 2009

	2009	2008
Note	\$'000	\$'000
Operating activities		
Deficit before grants from ministries	(820,069)	(548,940)
<i>Adjustments for:</i>		
Research grant income	(128,947)	(124,489)
Depreciation of property, plant and equipment	153,556	148,339
Amortisation of prepaid lease	166	166
Loss on disposal of property, plant and equipment	948	2,980
Loss on investments	275,936	34,745
Deferred capital grants amortised (non-ministry)	(11,621)	(10,889)
Interest income	(5,246)	(10,080)
Provision for attrition	(5,202)	(3,000)
Gain on derecognition of available-for-sale financial assets	-	(2,672)
Fair value adjustment	1,546	-
	(538,933)	(513,840)
<i>Changes in working capital:</i>		
Other payables	(109)	45,018
Trade and other receivables	(11,067)	(25,473)
Deferred tuition and other fees	2,323	4,169
Loans extended to students	10,296	(8,071)
Cash flows from operating activities	(537,490)	(498,197)

CONSOLIDATED CASH FLOWS STATEMENT

YEAR ENDED 31 MARCH 2009

		2009	2008
	Note	\$'000	\$'000
Financing activities			
Sinking fund received		22,782	10,863
IT and F&E grant received		34,821	21,148
Research grants received		143,858	145,461
Operating grants received, net of payment of goods and service tax expense on tuition fees and tuition grants		457,067	424,949
Development grants and related income received		33,864	79,800
Ministry grants received		68,785	75,112
Proceeds from borrowings		48,000	94,000
Cash flows from financing activities		809,177	851,333
Investing activities			
Acquisition of property, plant and equipment		(124,462)	(158,907)
Purchase of other financial assets		(285,944)	(454,914)
Proceeds from sale of other financial assets		475,444	357,092
Increase in cash held by fund managers	12	47,908	2,828
Interest received		4,436	9,892
Cash flows from investing activities		117,382	(244,009)
Net increase in cash and cash equivalents		389,069	109,127
Cash and cash equivalents at beginning of the year		477,962	368,835
Cash and cash equivalents at end of the year	12	867,031	477,962

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