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PRESS RELEASE

**TOP SCIENTISTS TO RECEIVE INAUGURAL PRESIDENT'S
SCIENCE AND TECHNOLOGY AWARDS FOR OUTSTANDING
CONTRIBUTIONS TO R&D LANDSCAPE IN SINGAPORE**

***Professor Miranda Yap honoured for developing Singapore's biologics
industry and nurturing young talent for R&D sector***

1. Eight outstanding research scientists and engineers will receive the inaugural President's Science and Technology Awards (PSTA) from President S R Nathan at the award ceremony held at the Istana on 28 September 2009. The PSTAs are the highest honours bestowed on exceptional individuals and teams for their excellent achievements in science and technology, and their outstanding contributions to the research and development landscape in Singapore.

2. The most prestigious of the awards, the President's Science and Technology Medal (PSTM), will be presented to Professor Miranda Yap, for her sustained, distinguished and strategic contributions to Singapore's Biomedical Sciences landscape, particularly in the areas of developing the biologics industry sector, building the research culture and nurturing young talent. The Executive Director of A*STAR's Bioprocessing Technology Institute (BTI), who is also the Executive Director of A*STAR's Graduate Academy, is one of the leading pioneers of Singapore's biomedical sciences (BMS) R&D sector. She has played a pivotal role in the development of Singapore's growing biologics industry, and is instrumental in attracting five leading multi-national biologics manufacturing companies to set up six commercial scale biologics manufacturing plants here.

These will employ almost 1,300 staff and bring in more than S\$2.5 billion in investment.

3. Said Professor Yap, "I am deeply honoured to receive this prestigious award. I would like to acknowledge the past and present team at BTI for their belief and ceaseless efforts in sharing my desire to establish an industry that was non-existent when BTI was established as a unit in 1990. They have worked hard to build up research capabilities for the biologics sector as well as pushing for scientific excellence which has put Singapore in high regard by many around the world. I must also add that the coordinated efforts arising from the biomedical sciences initiative and the presence of the Biopolis had also greatly supported our work. It is truly gratifying to be able to see the fruits of our labour in the form of the rapidly growing biologics sector in Singapore."

4. The President's Science Award (PSA) will be presented to Professor Donald Tan, Professor Roger Beuerman and Associate Professor Aung Tin – a team of clinician scientists from the Singapore Eye Research Institute, Singapore National Eye Centre, and Yong Loo Lin School of Medicine, National University of Singapore. The trio is recognised for its outstanding contributions in translational, clinical and epidemiological corneal research, which have led to the discovery of new knowledge, and the pioneering of novel medical and surgical therapies for improved outcomes for patients suffering from blinding corneal diseases.

5. Some examples of the trio's research that have resulted in clinical innovations and inventions include:

- a. a novel serum-free technique to culture conjunctival stem cells for eye stem cell transplant which reduced the risk of disease transmission, and
- b. a surgical device, Tan EndoGlide, used by surgeons around the world to perform keyhole, sutureless corneal transplantation.

The trio also pioneered the first Asian series of Osteo-Odonto Keratoprosthesis procedures in which the patient's own tooth is removed and used to implant an artificial cornea into the eye.

6. The President's Technology Award (PTA) will be presented to Professor Jacob Phang, Mr Chua Choon Meng, Mr Alfred Quah and Mr Goh Szu Huat from the Department of Electrical and Computer Engineering, National University of Singapore, and SEMICAPS Pte. Ltd, Singapore. This exceptional team of research scientists and engineers from academia and industry is recognised for the contributions it made to identify flaws and perform failure analysis in advanced integrated circuits.

7. The team's ten years of intense research resulted in the development of an integrated multi-laser near-infrared scanning optical microscope system for the design debug and failure analysis of advanced integrated circuits down to the 32 nm technology node. As of 31 Dec 2008, this notable system has been adopted by seven of the world's top 25 semiconductor manufacturers. Twenty-five systems with invoice values of more than S\$25m have been delivered worldwide, more than 90% of which were to destinations outside Singapore.

8. Lauding the accomplishments of this year's award winners, Mr Lim Chuan Poh, Chairman of A*STAR said, "I would like to extend my heartiest congratulations to the winners. They have collectively raised the bar for research excellence in Singapore. At the same time, their efforts have also created visible impact in the biologics, healthcare and semiconductor sectors in Singapore. Their contributions speak eloquently of the potential benefits brought about by mission-oriented R&D. This is especially important as Singapore continues its transformation into a knowledge based, innovation driven economy".

9. Said Mr Ravi Menon, 2nd Permanent Secretary, Ministry of Trade and Industry and Chairman of the PSTA Main Selection Committee, "It has been a

delight chairing the selection committee for the PSTA. The quality of the candidates and their work was very impressive, rising year after year. It is testament to the sterling progress made by the R&D community in Singapore.”

Young Scientist Awards (YSA)

10. In addition to the PSTAs, three Young Scientist Awards (YSA) will also be presented to scientists aged 35 years and below, who are actively engaged in R&D in Singapore, and who have shown great potential to be world-class researchers in their fields of expertise. The awards are organised by the Singapore National Academy of Science and supported by A*STAR. These awards will be presented by Mr Lim Hng Kiang, Minister for Trade and Industry.

11. More information on the winners of PSTA and YSA are at [Annex B and E respectively](#).

Background

12. 2009 marks the first year that the PSTAs are presented. The awards, formerly known as the National Science and Technology Awards since 1987, have been elevated to the status of the President’s awards to highlight and give due recognition to the important role research scientists and engineers play in Singapore. The prestige of the President’s awards underpins Singapore’s efforts to raise the level of excellence in research and strengthen the growing community of scientific talent in Singapore.

AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH

Enclosed:

Annex A – List of PSTA winners

Annex B – Citations of PSTA winners

Annex C – Factsheet on PSTA and Award Selection Committees

Annex D – Information Sheet on YSA (including list of YSA winners)

Annex E – Citations of YSA winners

For queries and clarifications, please contact:

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About the Agency for Science, Technology and Research (A*STAR)

The Agency for Science, Technology and Research (A*STAR) is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based Singapore. A*STAR actively nurtures public sector research and development in Biomedical Sciences, and Physical Sciences and Engineering, and supports Singapore's key economic clusters by providing intellectual, human and industrial capital to our partners in industry and the healthcare sector. It oversees 23 research institutes, consortia and centres located in Biopolis and Fusionopolis, and the area in their vicinity, and supports extramural research in the universities, hospitals, research centres, and with other local and international partners.

For more information about A*STAR, please visit www.a-star.edu.sg.

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LIST OF PRESIDENT'S SCIENCE AND TECHNOLOGY AWARD WINNERS

President's Science and Technology Medal (PSTM)

- **Professor Miranda Yap**
*Executive Director, Bioprocessing Technology Institute, and
Executive Director, A*STAR Graduate Academy
Agency for Science, Technology and Research (A*STAR)*

President's Science Award (PSA)

- **Professor Donald Tan**
Professor Roger Beuerman
Associate Professor Aung Tin
*Singapore Eye Research Institute, Singapore National Eye Centre
Yong Loo Lin School of Medicine, National University of Singapore*

President's Technology Award (PTA)

- **Professor Jacob C H Phang**
Mr Chua Choon Meng
Mr Alfred C T Quah
Mr Goh Szu Huat
*Department of Electrical and Computer Engineering, National University of
Singapore
SEMICAPS Pte Ltd, Singapore*

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CITATIONS OF PRESIDENT'S SCIENCE AND TECHNOLOGY AWARD WINNERS**President's Science and Technology Medal 2009****Professor Miranda Yap**

*Executive Director, Bioprocessing Technology Institute, and
Executive Director, A*STAR Graduate Academy
Agency for Science, Technology and Research (A*STAR)*

"For her sustained, distinguished and strategic contributions to Singapore's Biomedical Sciences landscape, particularly in the areas of developing the biologics industry sector, building the research culture and nurturing young talent"

Professor Miranda Yap, the founding Executive Director of Bioprocessing Technology Institute (BTI) and the Executive Director of A*STAR Graduate Academy (A*GA), has played a pivotal role in developing the biomedical sciences research landscape in Singapore since 1990. Her sustained contributions in cultivating a vibrant bioprocess R&D environment, which include raising the standard of research in Singapore and developing a significant critical mass of highly skilled R&D talent, have resulted in the growth of the biologics industry and reaped significant outcomes for Singapore. Her efforts were instrumental in helping Singapore to attract five leading multi-national biologics manufacturing companies to set up six commercial scale biologics manufacturing plants here, which will potentially employ almost 1,300 staff and bring in more than S\$2.5 billion in investments.

Under her leadership, BTI has been steadily developing research capabilities in bioprocessing, training highly skilled manpower and providing core services for the biotechnology industry. A major outcome of BTI's work is the establishment of the Biopharmaceutical Manufacturing Technology Centre (BMTC) – a cGMP facility – in 1999 for the production of clinical grade materials as contract service to local and overseas biotechnology companies. BMTC was subsequently spun out in 2004 as A-Bio Pharma, a commercial entity and the first biologics contract manufacturing company in Singapore. Today, A-Bio Pharma has built up a successful client base of companies, providing process development, optimisation, manufacturing scale-up, GMP production, quality control and regulatory compliance to pharmaceutical and biotech companies.

BTI's bioprocess R&D efforts, as spearheaded by Professor Yap, have resulted in several successful collaborations and partnerships with academia and industry. A case in point is the Consortium for Chinese Hamster Ovary Cell Genomics, which was jointly organised by BTI and the University of Minnesota in 2006. Set

up with a sum of close to US\$2 million that was provided by companies through the Society for Biological Engineering (USA), the consortium has since attracted the participation of nine leading pharmaceutical and biotechnology companies including Bayer Healthcare AG, Boehringer Ingelheim, Bristol-Myers Squibb, SAFC Biosciences and Schering Plough. Another example is GSK Biologicals SA Belgium's S\$2 million commitment to collaborate with BTI in three vaccine and adjuvant system related research projects.

A firm believer in the importance of talent development for R&D and industry, Professor Yap has been relentless in training promising young people. Through BTI, she made available opportunities for chemical engineering undergraduates and post-graduate students at NUS to specialise in biopharmaceutical engineering. In 2005, she also initiated an intensive hands-on training programme, the Bioprocess Internship Programme, to prepare science and engineering graduates for careers in bioprocessing. By building up a ready pool of talent trained in biologics manufacturing, she made it attractive for companies to invest Singapore.

In her role as the Executive Director of A*GA since 1 November 2006, Professor Yap led A*GA to introduce new initiatives under the Youth Science Programme to cultivate students' interest in science and to enthuse young Singaporeans to pursue careers in Science and Technology. Some examples include providing opportunities for A*STAR scientists to engage teachers and students to develop in them an awareness of R&D, as well as establish and administer scholarships for bright Singaporeans in upper secondary schools. Through these initiatives, A*GA has built up a healthy pipeline of young Singaporeans keen on pursuing research as a career. Under her watch, A*GA also introduced other scholarships and awards to encourage international students to do their PhDs in Singapore and A*STAR so as to build up an internationally diverse PhD talent pool as well as strengthen the network of PhD talent connected with Singapore and A*STAR. These include the Singapore International Graduate Award (SINGA), the A*STAR Research Attachment Programme (ARAP), and the Singapore International Pre-Graduate Award (SIPGA). In addition, Professor Yap has also contributed towards strengthening linkages between A*STAR and internationally renowned research institutions and universities so as to increase the opportunities available for A*STAR scholars and fellows to train there.

Professor Yap's other achievements include setting up the Centre for Natural Product Research (CNPR), a joint venture between GlaxoWellcome and the Institute for Molecular & Cell Biology in 1993, and heading it for seven years until 2000. CNPR was privatised in 2002 to form MerLion Pharmaceuticals, a leading natural product-based R&D company. Professor Yap also led the development of the Singapore Stem Cell Bank (SSCB), which represents an important initiative in Singapore to advance stem cell research and the development of stem cell-based technologies. SSCB is a centralised repository and distributor of high quality research-grade human stem cell lines that are maintained and

characterised according to validated and standardised processes for basic and translational research.

Professor Yap's outstanding achievements in education, research and management in the field of mammalian cell culture were recognised by the prestigious U.S. National Academy of Engineering which elected her as a Foreign Associate in February 2006. She became the first foreign female associate and the only engineer in Singapore to be elected into the academy. For her contributions, Professor Yap was honoured locally with the National Day's Public Administration Medal (Silver) in 2003.

For her sustained, distinguished and strategic contributions to Singapore's Biomedical Sciences landscape, particularly in the areas of developing the biologics industry sector, building the research culture and nurturing young talent, Professor Miranda Yap is awarded the President's Science and Technology Medal 2009.

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President's Science Award 2009

Professor Donald Tan
Professor Roger Beuerman
Associate Professor Aung Tin
Singapore Eye Research Institute
Singapore National Eye Centre
Yong Loo Lin School of Medicine, National University of Singapore

“For their innovative breakthroughs in “bench-to-bedside” medical research in blinding corneal diseases, leading to major advancements in scientific knowledge and the treatment of corneal blindness”

Over the last decade, Professor Donald Tan, Professor Roger Beuerman and Associate Professor Aung Tin have solved many mysteries of corneal diseases, and invented treatment modalities which are now mainstream approaches adopted world-wide. The trio has spearheaded pivotal corneal research programmes that span the range of fundamental research from clinical innovations to public health interventions. This is a true *“bench to bedside to population”* approach which has direct impact on reducing corneal blindness and placed Singapore at the forefront of corneal research.

At the *bench*, the team's efforts have led to new insights into corneal and ocular surface stem cell biology and the causes of inherited corneal diseases. Their Ocular Surface Stem Cell Research Programme has succeeded in growing adult ocular stem cells in the laboratory. They have patented a novel serum-free technique to culture conjunctival stem cells, thus reducing the risk of disease transmission by eliminating the use of animal cells or serum. The team also discovered the gene responsible for congenital hereditary endothelial dystrophy (CHED), a severe form of blindness occurring in children. They found that this same gene is also mutated in the commonest form of age-related corneal degeneration, Fuch's endothelial dystrophy, which opens up opportunities for gene therapy for this disorder.

At the *bedside*, they were the first in the world to perform a series of bioengineered human conjunctival stem cell transplants in patients with chemical and burn injuries, Stevens Johnson syndrome and pterygium. The team has also transformed the field of corneal transplantation and artificial cornea surgery. The innovations in transplantation, in which only partial layers of the cornea are surgically replaced, have led to reduced rates of graft rejection and improved graft survival. The Tan EndoGlide, a patented surgical device invented at SERI, is used by surgeons around the world to perform keyhole, sutureless corneal transplantation, also known as Endothelial Keratoplasty (EK). Where corneal or stem cell transplantation would not be successful, the team have turned to the artificial cornea, and pioneered the first Asian series of Osteo-Odonto

Keratoprosthesis (OOKP) procedures in which the patient's own tooth is removed and used to implant an artificial cornea into the eye.

Finally, the group's research at the *population* level prevented a major outbreak of blinding corneal infections on a global scale. In 2006, through a nation-wide epidemiological study, the group was the first to identify that a major outbreak of *fusarium keratitis* a severe fungal corneal infections, was due to contamination of a well-known contact lens cleaning solution.

For their outstanding contributions in translational, clinical and epidemiological corneal research leading to the discovery of new knowledge and the pioneering of novel medical and surgical therapies for improved outcomes for patients suffering from blinding corneal diseases, the SERI team made up of Prof Donald Tan, Prof Roger Beuerman and Assoc Prof Aung Tin is awarded the 2009 President's Science Award.

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President's Technology Award 2009

Professor Jacob C H Phang

Mr Alfred C T Quah

Mr Goh Szu Huat

*Department of Electrical and Computer Engineering, National University of
Singapore*

Mr Chua Choon Meng

SEMICAPS Pte Ltd, Singapore

“For their outstanding contributions to the research, development and commercialisation of scanning optical microscope systems for design debug and failure analysis of advanced integrated circuits which have been adopted by some of the world's top semiconductor manufacturers”

To the team from the National University of Singapore's Department of Electrical and Computer Engineering and SEMICAPS Pte Ltd, failure analysis is integral to the development and manufacture of semiconductor integrated circuits. With every technology node that results in smaller geometries and faster devices, the incidence of failure increases significantly.

The new circuit architecture and advanced fabrication processes associated with the new technology nodes mean that new failure mechanisms have evolved, which would require new failure analysis techniques for fault localisation and characterisation. Since failure analysis is a reactive step, the tools and techniques which lag behind the design and process technologies have, in recent years, been responsible for the delay in transition to the next technology node.

Led by Professor Jacob Phang, the team developed an integrated multi-laser near-infrared scanning optical microscope system for the design debug and failure analysis of advanced integrated circuits down to the 32 nm technology node. The system incorporates a suite of backside techniques for fault localisation jointly developed by National University of Singapore and SEMICAPS Pte Ltd. The joint project has resulted in active fault localisation techniques with the highest sensitivity and spatial resolution achievable.

Recently, the resolution and sensitivity enhancements techniques have also led to the successful imaging of a single defective via from 65 nm technology node – something that has not been achieved previously. The joint project has also established a new paradigm of tester-based fault localisation techniques which allows design debug and failure analysis to take place at full device operating speeds.

This project has resulted in 13 publications, two best paper awards, four invited papers, four invited presentations and six patents. In addition, SEMICAPS has also developed and commercialised five system configurations for analytical,

tester-docked and wafer prober applications that meet the diverse needs of design debug, product engineering, yield enhancements and customer returns for integrated device manufacturers, foundries, fab-less and failure analysis service companies.

The impact of the project is evident from the extensive adoption of these systems and techniques by integrated device manufacturers, foundries, fab-less companies and failure analysis service providers. As of 31 Dec 2008, the systems have been adopted by seven of the world's top 25 semiconductor manufacturers. Twenty-five systems with invoice values of more than SGD25M have been delivered worldwide, more than 90% of which were to destinations outside Singapore.

The development has provided the team with a strategic position to collaborate with leading semiconductor companies, research institutes and technology companies in projects that will lead to failure analysis technologies that will meet the future challenges of advanced semiconductor technology nodes.

For their outstanding contributions to the research, development and commercialisation of scanning optical microscope systems for design debug and failure analysis of advanced integrated circuits which have been adopted by some of the world's top semiconductor manufacturers, the team, made up of Professor Jacob Phang, Mr Alfred C.T. Quah and Mr Goh Szu Huat from the Department of Electrical and Computer Engineering, National University of Singapore, and Mr Chua Choon Meng from SEMICAPS Pte Ltd, Singapore, is awarded the 2009 President's Technology Award.

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FACTSHEET ON PRESIDENT'S SCIENCE AND TECHNOLOGY AWARD SELECTION COMMITTEES

About the President's Science and Technology Awards

The President's Science and Technology Awards (PSTA) are the highest honours bestowed on exceptional research scientists and engineers in Singapore for their excellent achievements in science and technology, and outstanding contributions to the development of the research and development landscape in Singapore.

President's Science and Technology Medal

The President's Science and Technology Medal is awarded to outstanding individuals who have made distinguished, sustained and exceptional contributions and played a strategic role in the development of Singapore through the promotion and management of R&D. Recipients receive a specially designed gold medal and a citation.

President's Science Award

The President's Science Award is presented to research scientists and engineers in Singapore who have made outstanding contributions in basic research leading to the discovery of new knowledge or the pioneering development of scientific or engineering techniques and methods. Recipients will receive a crystal trophy, a citation and a prize of \$50,000.

President's Technology Award

The President's Technology Award gives recognition to research scientists and engineers in Singapore who have made outstanding contributions to research & development resulting in the invention or discovery of significant technology with industrial applications. Recipients will receive a crystal trophy, a citation and a prize of \$50,000.

Award Selection Committees

The award selection panels comprised key representatives from the industry, academia, defence and research institutes. The main selection committee was chaired by Mr Ravi Menon, Second Permanent Secretary, Ministry of Trade and Industry.

Prof Lui Pao Chuen, Advisor, National Research Foundation, and Mr Tan Gee Paw, Chairman, Public Utilities Board, chaired the selection committees for the National Science Award and National Technology Award respectively.

INFORMATION SHEET ON YOUNG SCIENTIST AWARD**List of Young Scientist Award Winners**

- **Dr Loh Yuin Han, Jonathan**
Agency for Science, Technology & Research
- **Assistant Professor Haifeng Yu**
Department of Computer Science, National University of Singapore
- **Assistant Professor Yu Ting**
Division of Physics and Applied Physics
School of Physical and Mathematical Sciences
Nanyang Technological University

Young Scientist Award

The Young Scientist Awards recognise young researchers, aged 35 years and below, who are actively engaged in R&D in Singapore, and who have shown great potential to be world-class researchers in their fields of expertise. This award is organised by the Singapore National Academy of Science and supported by A*STAR. Recipients will receive a trophy, a certificate of commendation and a prize of \$10,000.

Young Scientist Award Selection Committee

The judging committee for the Young Scientist Awards, which is organised and administered by the Singapore National Academy of Science (SNAS), is chaired by its President, Prof Leo Tan.

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CITATIONS OF YOUNG SCIENTIST AWARD WINNERS

Young Scientist Award 2009

Biological and Biomedical Sciences

Dr Loh Yuin Han Jonathan

Agency for Science, Technology & Research

“For his research on embryonic stem cells and epigenetic reprogramming”

The ability to derive multiple cell types from embryonic stem (ES) cells opens up exciting new opportunities for their use in regenerative medicine. Dr. Loh's research focuses on understanding the genetic and epigenetic mechanisms underpinning the self-renewal and pluripotency of the ES cells.

Dr Loh and his colleagues at the Genome Institute of Singapore pioneered the use of functional genomics to elucidate the transcriptional network of the master regulators that govern the ES cells. This has enhanced our understanding of how the “stemness” state of the ES cells is regulated. He also discovered three novel transcription factors that are involved in controlling and establishing the ES cells state. Dr Loh's work in epigenetics has also revealed the mechanisms whereby the ES cell master regulators can modulate the unique chromatin architecture of the ES cells by regulating two novel epigenetic factors. Recently, Dr Loh and his colleagues at the Children's Hospital Boston were the first in the world to achieve the reprogramming of human blood cells into ES-like induced pluripotent stem (iPS) cells. This is an important step towards the development of more efficient ways of generating patient-specific pluripotent stem cells for clinical transplantation.

Dr. Loh's achievements have gained international recognition amongst his peers. His work has been published in top international journals such as *Cell*, *Nature Genetics*, *Nature Cell Biology*, *Genes and Development*, and *Blood*. His articles have been cited over 900 times and were highlighted and featured by the editors from prestigious journals including *Nature Reviews Genetics* and *Nature Methods*. He was also the recipient of the Philip Yeo Prize for his outstanding achievements in research in 2008. Currently, Dr Loh is working on using iPS technology to understand human diseases.

Young Scientist Award 2009

Physical, Information & Engineering Sciences

Assistant Professor Yu Haifeng
Department of Computer Science
National University of Singapore

“For his research on defending against sybil attacks and on distributed systems security”

Dr. Yu’s research centers around distributed systems, distributed algorithms, and distributed systems security. The overarching goal of his research is to make emerging novel distributed systems more robust. He is known for his track-record of focusing on and addressing intrinsically-challenging research problems. Over the past few years, Dr. Yu pioneered a series of ground-breaking and highly-effective randomized defense mechanisms against sybil attacks in distributed systems. Sybil attacks are rather fundamental, and are widely considered to be challenging, if not impossible, to defend against. Dr. Yu’s research results opened up new directions for addressing this notoriously difficult problem. His novel approaches and results have been quickly followed up by the international research community. In addition to his work on defending against sybil attacks, Dr. Yu has also made significant contributions in other security problems in distributed systems such as secure aggregation.

Dr’s Yu’s achievements have gained international recognition. He has published extensively in premier publication venues in his field, and many of his papers have been selected as top papers in the corresponding venues. His publications have received over 900 total citations, and have been used as course materials in universities worldwide. He also serves on the Programme Committee of premier conferences to review and judge other researchers’ work.

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Young Scientist Award 2009

Physical, Information & Engineering Sciences

Assistant Professor Yu Ting

School of Physical and Mathematical Sciences
Nanyang Technological University

“For his research on metal oxide nanostructures and graphene for development of nanodevices and energy harvest”

Dr Yu's research focuses on the fabrication of metal oxide nanostructures and graphene, investigation of their physical and bio/chemical properties as well as the development of nanodevices. He has developed a method for the synthesis of metal oxide nanostructures which has the advantages of being substrate-friendly, applicable on a large-scale, morphology-controllable and of low-cost. This has been widely adopted. For the first time, Dr Yu has demonstrated the ability of optical tweezers in the manipulation of nanowires. Based on this strategy, a powerful probe has been developed for the study of nanophotonics. Dr Yu has received many “firsts” in graphene study. The studies on uniaxial/local strain and hydrogen plasma effects on graphene have facilitated the development of new approaches for engineering the structure and properties of graphene.

Dr Yu's achievements have gained international recognition in the nanoscience and nanotechnology community. He has published more than 85 papers in top international journals, which have been cited over 820 times. He has also contributed to two book chapters and has been awarded one patent.

In addition, Dr Yu's research team is currently working on the controllable fabrication of high-quality and large yield of metal oxide nanostructures and graphene for energy harvesting, which includes Lithium ion batteries, supercapacitors and electrodes for dye-sensitised solar cells.