

Decade of scientific greatness

The 11 past winners of the President's Science and Technology Medal



2009

Professor Miranda Yap
Former Executive Director, A*STAR's Bioprocessing Technology Institute, and A*STAR Graduate Academy



2010

Professor Chong Tow Chong
President and Acting Provost, Singapore University of Technology and Design



2011

Professor Soo Khee Chee
Specialist, Farrer Park Hospital Senior Advisor, Professor, Benjamin Sheares Professor of Academic Medicine, Duke-NUS Former Director, National Cancer Centre Singapore



2012

Professor Dim-Lee Kwong
Executive Director, A*STAR's Institute for Infocomm Research, and Covering Executive Director, A*STAR's Institute of Microelectronics



2013

Professor Freddy Boey
Senior Vice-President, Graduate Education & Research Translation, National University of Singapore (NUS) Former Vice President and Provost, Nanyang Technological University, Singapore (NTU)



2013

Professor Barry Halliwell
Senior Advisor, Academic Appointments and Research Excellence, Office of the Senior Deputy President and Provost, NUS Tan Chin Tuan Centennial Professor Chairman of Biomedical Research Council, A*STAR



2014

Professor John Eu-Li Wong
Isabel Chan Professor in Medical Sciences Chief Executive, National University Health System Senior Vice-President (Health Affairs), NUS



2015

Mr Tan Gee Paw
Special Advisor to Chairman, PUB Former Chairman, PUB



2016

Professor Bertil Andersson
President Emeritus, NTU Singapore



2017

Professor Edward Warren Holmes
Department of Medicine, Yong Loo Lin School of Medicine, NUS Senior Fellow, A*STAR Advisor, National Research Foundation



2017

Professor Sir David Philip Lane
Chief Scientist, A*STAR Director, p53 Laboratory, A*STAR Chairman, Chugai Pharmabody Research



Prof Yap made distinguished contributions to Singapore's biomedical sciences landscape. STIFL

In a class of their own

Two eminent professors tell **Esther Teo** and **Michelle Chin** about their current projects and developments in their respective fields

FEW have the honour of being awarded the President's Science and Technology Awards (PSTA), Singapore's top scientific accolade. Multiple winners are even more of a rarity.

Yet two professors have not only won the award, they have achieved the rare feat twice. Find out more about them here.



Pushing the limits

A SERIAL inventor who pioneered functional biomaterials for medical devices, Professor Freddy Boey, 62, was part of a team that won the President's Technology Award in 2014, and the winner of the President's Science and Technology Medal in 2013.

The Senior Vice-President of the Graduate Education and Research Translation department at the National University of Singapore shares what excites him in the industry:

"It is fortuitous that materials science is a sunrise-to-sunrise discipline that lifts up one industry after another.

"Materials scientists today should know that the field has no boundaries. For example, when I was the Chair of the Nanyang Technological University's School of Materials Science and Engineering (MSE), I saw the application of materials science on the human body as a new but viable area, so I moved the school to teach a non-traditional subject as a core undergraduate subject — biomaterials for medical devices.

"At first, some were sceptical while others were upset. I challenged the school to become top 10 in the world. Ten years later in 2014, the school was ranked top 10 in world MSE ranking and continues to remain at that level till today.

"More recently, I am excited by the developments taking place in the food science and technology sector.

"Materials scientists have a role to play to increase the world's food production, and improve processing and monitoring procedures."



Eye on the future

PROFESSOR Wong Tien Yin, 50, is a renowned ophthalmologist, scientist clinician and health administrator.

Part of a team that won the President's Technology Award in 2014 and the winner of the President's Science Award in 2010, Prof Wong is the Deputy Group Chief Executive Officer (Research & Education) of SingHealth, and Vice-dean of Duke-NUS Medical School.

He shares his current plans and upcoming developments of the field:

"Perhaps the most satisfying moment of my career is observing how there is an increasing number of younger clinicians who are interested in becoming clinician scientists.

"I am currently involved in various mentorship and leadership roles, with an aim to ensure there is a fertile ecosystem to support the next generation of academic clinicians, so hopefully there can be more clinician scientists to pursue award-winning work.

"We are moving from single investigator research to research done with large collaborative teams hailing from different disciplines.

"For instance, research translation in my area requires a team of primary care physicians, endocrinologists, health economists and computer scientists working on data analytics and artificial intelligence.

"Part of my research includes a team effort to study eye image analysis technologies to determine the onset of systemic vascular diseases.

"We are progressing towards artificial intelligence algorithms to analyse retinal photos for retinopathy and systemic complications in diabetes patients."

Stars in the spotlight

On its 10th anniversary, past winners of the President's Science and Technology Awards talk about their inspirations and how Singapore's investment in research and development has borne fruit

BY ESTHER TEO
Sweet Writer

THER life's work touches us in many unseen ways, from fighting blindness to creating Singapore's first commercial earth observation satellite.

Each year, outstanding individuals in the fields of science and engineering are feted during the President's Science and Technology Awards (PSTA).

Previously known as the National Science and Technology Awards from 1987 to 2008, they were elevated to the status of the President's awards — the nation's highest scientific honours — in 2009.

PSTA Chairman Tan Gee Paw says: "Science, technology, engineering and mathematics (STEM) is the pillar of our intellectual capital. The PSTA, being the pinnacle awards, play a critical role in recognising this."

A*STAR Chairman Lim Chuan Poh says: "The PSTA reflects the meaningful contributions of Singapore's scientific talents and gives a glimpse of the diverse fields and capabilities across our public research institutes, institutes of higher learning, as well as the hospitals and clinical community. The starting point is always excellent science, and the end goal is to bring benefits to our economy and society. The PSTA winners continue to make an impact on Singapore and beyond, and their ongoing endeavours and achievements add to Singapore's reputation as a global talent hub and an emerging innovation and enterprise ecosystem."

"Even when faced with no funding or other difficulties, Miranda would persist in research and pursue her passions. She would still push her convictions and the many valuable insights she gained from colleagues from all over the world."

The 2018 PSTA and Young Scientist Awards (YSA) ceremony will be held next Tuesday. The YSA, which are also presented at the PSTA ceremony, are conferred on young researchers aged 35 and below, who are actively engaged in R&D in Singapore, and have shown great potential to be world-class researchers in their fields of expertise.

From strength to strength

Since its inception, a total of 34 awards have been conferred at PSTA on individuals and teams for their outstanding and invaluable contributions to the research and development landscape in Singapore.

S&T [Science & Technology] has become an integral pillar of our economy as companies move up the value chain to undertake more capital-, tech- and innovation-intensive activities. We have put in place a strong environment for Intellectual Property protection and enforcement, and established a network of public and private sector R&D centres that work together to develop and commercialise new technologies, processes and products. These efforts are underpinned by our long term investment in training skilled science and technology manpower in our schools, universities and research institutes.

— MR LIM HNG KIANG, Special Advisor, Ministry of Trade and Industry, in his first PSTA speech in 2009

PSTA in numbers (2009-2017)

PSTA given out

34

PSTM winners

11

PSA winners

20

PTA winners

28

YSA given out

28

Paving the way

These scientists speak about how winning the prestigious Young Scientist Award and President's Science and Technology Award has defined their careers. **Joshua Wong** and **Michelle Chin** report

THEY started out by winning the Young Scientist Awards (YSA) as budding talents in their fields, before achieving a career milestone — the coveted President's Science and Technology Awards (PSTA).

These scientists may be established names now, but they still look forward to achieving more in their journeys.

Overcoming the odds

DR DESMOND Rodney Lim, 47, senior director at DSO National Laboratories (DSO) is currently seconded to the Defence Science and Technology Agency (DSTA) as director, Advanced Systems. He won the YSA in 2003 and was part of a team that clinched the President's Technology Award in 2016.

Dr Lim lists the traits that will go a long way towards success: "There is no substitute for passion, hard work and resilience in overcoming difficulties.

"I was fortunate to be given many opportunities to explore diverse disciplines, from photonics, communication systems, to sensor systems. I got to work in academia, government service and a start-up. Through the years, I developed a good scientific foundation and acquired a 'toolkit' of skill sets which served me well across the different roles I took on.

"When I was at DSO, we partnered Nanyang Technological University, National University of Singapore and ST Electronics (Satellite Systems) on advancing Singapore's satellite engineering and systems capabilities. This team effort launched Singapore's first commercial earth observation satellite TELEOS-1, and won the President's Technology Award in 2016.

"I thoroughly enjoy working alongside the dynamic, passionate people in both DSO and DSTA who excel in their areas of expertise to push technology and help shape Singapore's defence."



Turning fantasy into reality

PROFESSOR Louis Phee, 47, is the Dean, College of Engineering, College Dean's Office, at the Nanyang Technological University, Singapore.

Part of a team that won the President's Technology Award in 2012 and winner of the YSA in 2006, he reveals what attracted him to robotics:

"When I first saw Luke Skywalker's dismembered hand replaced by a robotic one in Star Wars, it was pure fantasy — but it got me interested in working with robots. Thirty years later, technology has made robot-assisted surgery possible.

"There has been a marked exponential growth in the R&D scene in Singapore since I was a student. With hard work and investment, we have

come a long way, achieving international recognition.

"In the future, we may see the integration of artificial intelligence and data science with robotics, which may reduce or even eliminate the need for a human surgeon controlling the robot.

"My greatest reward comes from seeing my robot benefiting patients. Instead of spending a week in hospital recovering from an invasive surgical procedure, they can be discharged on the same day.

"Seeing the smiles on their faces is extremely fulfilling, and is something that money cannot buy."



Searching for breakthroughs

PROFESSOR Ng Huck Hui, 47, is the Executive Director of A*STAR's Genome Institute of Singapore (GIS), and the A*STAR Graduate Academy.

Part of a team that won the President's Science Award in 2011, he also won the National Science Award in 2007 and YSA in 2004.

He shares his plans:

"We started in GIS with the ambition to put Singapore on the map in stem cell genomics research. Being one of the pioneers in this field was very exciting, and winning the President's Science Award was a great encouragement and validation.

"Besides advancing science, we have succeeded in training the next generation of scientific lead-

ers in Singapore, who are now at A*STAR, National University of Singapore, National Neuroscience Institute, and also prestigious overseas institutions such as Stanford University.

"Although Singapore is young compared to the more established biomedical hubs in Boston or California, our community has nevertheless made tremendous progress.

"We aim not so much to catch up with them, but to find a niche for ourselves. Simply replicating what others have done is not enough — we must continue to attract the top talent and push the frontier of science in order to excel and differentiate ourselves in this field."



Keeping the flame burning

THE Deputy Executive Director of the Biomedical Research Council, A*STAR, and Professor at Duke-NUS Medical School, Professor Patrick Tan, 49, was part of a team that won the President's Science Award in 2015.

Prof Tan, who also picked up the Young Scientist Award in 2001, looks forward to improving patients' lives in the future:

"Team science allows us to achieve much more due to collaboration. Choosing the right team members and asking the right questions are important.

"The President's Science Award in 2015 was jointly awarded to Prof Teh Bin Tean, Prof Steven Rozen and me for our work on Asian cancer genom-

ics such as stomach, biliary tract, urinary tract and breast fibroepithelial tumours.

"Back in 2001, I was working on infectious diseases relevant to Asia, and I was honoured to win the Young Scientist Award that year.

"Throughout my career journey as a scientist, my curiosity about certain basic scientific questions and a driving passion for science have kept me going.

"Thanks to our efforts, Singapore is now a world leader in scientific research. In future, research may generate insights that bridge disciplines in the scientific ecosystem. Different disciplines working together translate to better treatments and diagnostics for patients."

Prof Liu believes women carry equal weight in STEM as men.

