

**REMARKS BY MR HENG SWEE KEAT, DEPUTY PRIME MINISTER AND
COORDINATING MINISTER FOR ECONOMIC POLICIES AND CHAIRMAN OF
THE NATIONAL RESEARCH FOUNDATION AT THE PRESIDENT'S SCIENCE
AND TECHNOLOGY AWARDS CEREMONY ON 20 OCTOBER 2023**

President Tharman Shanmugaratnam,
Ladies and gentlemen,

Good evening.

A very warm welcome to everyone.

Since 2009, the President's Science and Technology Awards have been held every year, to recognise and celebrate our outstanding scientists and technologists in Singapore.

This year, we are honoured to have President Tharman join us for the first time.

Since independence, our leaders have placed great emphasis on the role of science and technology in our nation's growth and development. That these awards are conferred by our Head of State underscores their value to our nation.

2023 marks the 100th birth anniversary of our founding Prime Minister Lee Kuan Yew.

In many ways, Mr Lee and his team were our pioneers at harnessing the transformative power of science and technology, to overcome our inherent constraints as an island-nation with little land or natural resources.

Two of Mr Lee's lasting legacies – the Singapore water story and our journey as a "Garden City" and more recently as a "City in Nature" – were made possible by combining science and technology with sound public policies.

Through science and technology, we made use of desalination and reverse osmosis to build a more stable and reliable water supply.

We also adopted more sustainable environmental practices to keep our island clean, green and liveable.

More recently, we saw how Singapore's early investments in science and technology fortified us in our fight against COVID-19, through research and development into diagnostics and therapeutics.

Our ability to harness science and technology will remain critical to our efforts to build a better life for Singaporeans, and to contribute to the world.

Whether it is in tackling challenges related to climate change, combatting the next pandemic, or dealing with the health needs of an ageing population, a deep mastery of science and technology will be critical.

These are common challenges faced by countries around the world.

Indeed, Singapore recognises that science is a global endeavour.

Let us do our best to bring the best minds together, to work across borders – be it national borders, or disciplinary borders, to advance our scientific research and make breakthrough innovations.

Talent is critical in our scientific endeavour.

To harness science and technology effectively, we need to have a two-pronged approach.

First, to do our utmost to inspire young people to take up, study, and embark on careers in STEM, and to develop our talent as fully as possible.

Second, to anchor top global scientists and research institutions in Singapore, to enrich our research ecosystem, and build a global network of like-minded experts.

On the first prong, we have invested – and continue to invest – in nurturing homegrown scientific talent.

Our students are exposed to science, technology, engineering and mathematics, or STEM, both in school and beyond, to nurture an interest in the sciences from an early age.

And we are stepping up efforts to grow our youth's interest in STEM, by stimulating their curiosity and developing a spirit of inquiry.

We have the Applied Learning Programme (ALP) in most of our schools, to encourage students to apply the scientific concepts that they have learnt in class to address real world challenges.

The new Science Centre that will open in a few years at Jurong Lake Gardens will also seek to stimulate the interest and curiosity of our young and not-so-young in the marvels of science and technology.

The Science Centre will set up innovation incubators to nurture future technopreneurs and to develop an appreciation of the real world relevance of science.

Today, we have around 1,600 Singaporeans pursuing STEM-related PhDs in our Autonomous Universities.

This is testament to the traction that our STEM education in schools has had over the years.

We also send some of our students to study in the best universities in the world, to pursue their undergraduate and postgraduate programmes.

Our research, innovation and enterprise ecosystem is growing in vitality, and provides further development opportunities for our people.

Our universities, medical institutions and 17 research institutes under A*STAR have all established strong and fruitful collaborations with industry and international partners.

Since 2007, the National Research Foundation has also developed the Campus for Research Excellence and Technological Enterprise (CREATE) which houses research centres in partnership with 9 overseas universities.

These have helped us establish peaks of excellence in wide-ranging areas such as in quantum technologies, artificial intelligence, genomics and other fields of biomedical sciences and more.

Beyond basic research, venture-builders are also leveraging Singapore as a test-bed for innovative solutions in different fields with a view to scaling these regionally and beyond.

Through these initiatives, we are making good progress on our aspirations to be a Global-Asia node of technology, innovation and enterprise.

An important element in talent development is having good role models.

Many years ago, Sir Isaac Newton wrote that “if I have seen further than others, it is by standing on the shoulders of giants”.

Indeed, in many fields, role models serve to inspire future generations to pursue excellence and go further, and scale higher, than what they have achieved.

In science specifically, role models can be exemplars of the value and impact of research excellence.

This in turn will help to galvanise young talent to step forward and invest their energies in coming up with even more innovative solutions to pressing problems.

Our award recipients this evening are all good role models.

They come from different backgrounds, age groups, disciplines, and institutions. I hope they serve as inspiration to our younger and budding generations of scientific talent.

Young Scientist Awards

First, we recognise three young, rising scientists with the Young Scientist Awards. Given out by the Singapore National Academy of Sciences, these honour promising scientists under the age of 35 who have shown great potential in their chosen fields.

Dr Tan Yong Zi, Assistant Professor at the National University of Singapore, is recognised for his contributions to cryo-electron microscopy. Techniques developed by Dr Tan have improved our ability to determine the structure of membrane proteins at near-atomic resolution. Insights gleaned from these help scientists to better understand biological processes, diseases, drug resistance, as well as in developing new therapeutics.

Dr Chang Guoqing, Assistant Professor at Nanyang Technological University, is recognised for his contributions to the field of topological quantum materials. Dr Chang's use of novel computational techniques allowed him to find novel quantum materials and predict unusual and unexpected properties. This could lay the foundations for improved applications in other domains, such as more efficient solar panels that could help boost global efforts towards greater renewable energy adoption.

Dr Soujanya Poria, Assistant Professor at the Singapore University of Technology and Design is recognised for his work in Natural Language Processing and Artificial Intelligence. By combining text, audio and video data

in novel deep learning models, Dr Soujanya is making strides in developing AI systems that understand human emotions and intentions.

This could lead to richer and more beneficial interactions between humans and AI platforms, with cascading benefits in education, healthcare, and workplace productivity.

President's Science and Technology Awards

Second, the President's Science Award recognises scientists who have made outstanding contributions with a transformative effect on one or more fields of science and technology.

This year's President's Science Award goes to Dr Qiu Cheng-Wei, Associate Professor at the National University of Singapore for his groundbreaking contributions to the field of topological thermal diffusion and radiation.

Applying quantum mechanics to the study of heat transfer and diffusion, Dr Qiu's work has led to a paradigm shift in the field of quantum thermal diffusion, particularly in thinking about heat confinement and transfer.

Through this, he has been able to create new materials that conduct heat far better than even the best found in nature.

While quantum mechanics may sound abstract, it actually underpins much of our modern technology including the semiconductor transistors in our phones, computers, and household appliances and even the satellites that empower our global connectivity.

Dr Qiu's work opens up the possibility of cooler and faster computer chips, or even cooler buildings coated with materials designed to dissipate heat using quantum mechanical principles.

Third and finally, the President's Science and Technology Medal is Singapore's top scientific honour, awarded to those who have distinguished themselves by advancing Singapore's development through science and technology.

This year's medal is awarded to Mr Quek Gim Pew for his outstanding contributions in shaping Singapore's research ecosystem and developing deep and needle-moving local science and technology local capabilities.

Gim Pew is well-known for his long and illustrious career in the defence sector, having led DSO National Laboratories from 2004 to 2016 and then serving as Singapore's Chief Defence Scientist from 2016 to 2021.

Just as importantly, Gim Pew has been a long-standing and passionate advocate for cross-sectoral science partnerships.

Through encouraging technological advancements in one field to be leveraged to accelerate breakthroughs in others, Gim Pew has helped to strengthen our overall R&D ecosystem.

In particular, Gim Pew has helped to steward Singapore's efforts at the frontier of two exciting and important domains – space science and quantum technologies.

Gim Pew's emphasis on partnerships led to DSO National Laboratories collaborating with the Nanyang Technological University to develop Singapore's first experimental satellite X-Sat, as well as with ST Engineering to build Singapore's first commercial earth observation satellite.

As Deputy Chairman of the Office for Space Technology and Industry, Gim Pew also contributed to Singapore becoming the first and only nation in Southeast Asia with the capability of designing and producing operational-class satellites independently.

Additionally, as Chairman of the Centre for Quantum Technologies based in NUS, Gim Pew steered the Centre to become a nationwide platform with partners like ST Engineering, A*STAR and other government agencies, building strong capabilities in quantum computing and communications and fabricating quantum devices.

Gim Pew also continues to contribute to Singapore's growing quantum research excellence by co-chairing the National Quantum Strategy Steering Committee.

Let me again extend my heartiest congratulations to all award recipients today for your exceptional accomplishments.

In particular, I am pleased to see that all of you have made contributions at the intersections of different scientific domains. This illustrates the importance of interdisciplinary research – that insights and breakthroughs achieved in one domain can inform and impact outcomes in others.

The awards tonight are a recognition of your achievements thus far, and I hope that they also serve to motivate you to aspire to even greater peaks ahead.

I encourage you to continue mentoring and developing younger talent, within and across your respective institutions, and inspiring fellow scientists and researchers to follow in your footsteps.

By harnessing our collective knowledge and creative energies, we can build a better future for Singapore and the world.

Thank you.

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