

Accidental find leads chemist to become first woman winner of individual President's Science Award



Professor Liu Bin is the first woman scientist to win the President's Science Award as an individual. ST PHOTO: MARK CHEONG



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SINGAPORE – The eureka moment for chemist Liu Bin came “absolutely by accident” in 2019.

“We were looking for molecules that emit very brightly and have a long lifetime... so we picked one that looked most promising, but we found something unusual,” said the Tan Chin Tuan Centennial Professor from the National University of Singapore (NUS), adding that every step towards the discovery was curiosity driven.

Over the next three years, the team found that commercial Carbazole, which is used as small fluorescence materials, contained trace amounts of impurities that they were able to develop to yield new materials.

The new materials, which are still being developed, could potentially shine brightly and have a long emission lifetime, opening up opportunities for their use in afterglow devices, naked-eye theragnostics, and optical encryption of data. Naked-eye theragnostics refers to a two-pronged approach to diagnosing and treating cancer that can be detected

with the naked eye.

“For example, if we can really make these molecules absorb sunlight very effectively and make their lifetime long enough, then they can be put on highways or pavements. They absorb the light in the daytime and emit at night. (This way) we will not need any power supply to see signals on the streets at night,” Prof Liu told The Straits Times.

This discovery bagged her the 2024 President’s Science Award, making her the first woman scientist to win the prize as an individual.

The award is part of the annual President’s Science and Technology Awards given to scientists whose work has led to significant scientific, technological or economic benefits for the country.

Three researchers and one team received this year’s four awards, which were given out on Sept 27 at Nanyang Auditorium, located within the Nanyang Technological University (NTU) campus.

The other awards are the President’s Science and Technology Medal – the nation’s top scientific honour – and the President’s Technology Award.



The individual winners of the President’s Science and Technology Awards – (from left) Professor Liu Bin, Professor Richard Parker and Professor Ho Teck Hua. ST PHOTO: MARK CHEONG

The President’s Science and Technology Medal was awarded to NTU president Ho Teck Hua and A*Star’s Singapore Aerospace Programme chairman Richard Parker.

Professor Ho was honoured for having made both NTU and NUS top-ranking in the world by transforming them into powerful talent magnets that draw both young and established researchers to Singapore.

“Recruiting top talent requires perfect teamwork. I am very fortunate to have had the chance to work with many talented individuals to attract top scientists to Singapore. With strong support from the Government over the last decade, I have been given the freedom and resources to drive innovation boldly. This has been very energising,” said Prof Ho.

“There are many people who have worked with me over the past decade to nurture a pipeline of top talent and build strong R&D ecosystems for Singapore. Therefore, this really is a team award,” he added.

Professor Parker, on the other hand, was lauded for being a “successful matchmaker”, creating effective collaborations between research practitioners and industry.

“Matchmaker is an interesting phrase for it, but I think it’s fitting,” he said, commenting on his passion for bringing industry and academics together from the time he was chief technology officer at Rolls-Royce and, more recently, since 2016, as a special adviser to A*Star.

“I really believe it is important that the national investment in research in universities and research centres should be tapped into by industry as effectively and efficiently as possible. If you can bring the two together to work in joint labs, to work in consortium activities, which I have been championing, then yes, that’s that’s a great way forward,” he said.

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The President’s Technology Award was given to a team, led by Professor Malini Olivo of the A*Star Skin Research Labs, in recognition of their development of a groundbreaking optical wearable technology to measure respiratory and lung physiological parameters.

This innovation has the potential to revolutionise clinical decision-making across the healthcare setting, from post-operative care and general wards to home environments.

Prof Olivio said: “Clinical collaboration is the lifeline of scientific innovation and excellence in medical technology. Without it, it is not possible to make advances.

“We are now moving in the direction of adaptation at hospitals in Singapore, the United States and Australia. This means that the technology will soon transform how we manage cardio-respiratory disease.”

A member of the team, Dr Augustine Tee, chairman of the division of medicine at Changi General Hospital, said there are opportunities to further enhance the wearable medical device with additional vital-sign parameters and algorithms, and extend its use to other areas of the hospital.

“(It) has exhibited the capacity to predict patient deterioration, providing a lead time of 18 to 21 hours prior to deterioration, (and) at a performance of 91.7 per cent,” added Dr Tee, who is also a senior consultant at the hospital’s department of respiratory and critical care medicine.

Speaking at the ceremony, Deputy Prime Minister and National Research Foundation chairman Heng Swee Keat said: “We invest in deepening our local talent pool through schemes like the A*Star scholarships and Industrial Postgraduate Programme. We tap the best global scientific talent and institutions to enter Singapore, to enrich our research ecosystem and build a global network of like-minded experts.”

This, he said, would support Singapore’s aspirations to be a Global-Asia node of technology, innovation and enterprise, bringing the best minds from around the world together to tackle shared challenges.

DPM Heng also presented the Young Scientist Award to four researchers who have made their mark early in their careers.

Recipients of the 2024 President’s Science and Technology Awards

President’s Science and Technology Medal:

- Professor Ho Teck Hua, president of NTU
- Professor Richard Parker, chairman of the Singapore Aerospace Programme at A*Star

President’s Science Award:

- Professor Liu Bin from NUS

President’s Technology Award:

- Professor Malini Olivo, Dr Gurpreet Singh and Dr Renzhe Bi from A*Star, and Dr Augustine Tee from Changi General Hospital

Recipients of the 2024 Young Scientist Award

- Dr Jonathan Goke from A*Star
- Dr Daniel Ting Shu Wei from the Singapore National Eye Centre
- Dr Li Qianxiao from NUS
- Dr Lu Jiong from NUS