

# S'pore prof wins top prize in engineering

NTU scientist shares Draper Prize with three others for work on lithium batteries



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**A** Nanyang Technological University don has become the first Singapore resident to win the Draper Prize, the Nobel equivalent

for engineers.

Professor Rachid Yazami, the Cheng Tsang Man Chair Professor in Energy at NTU's School of Materials Science and Engineering, won the prestigious prize for his work on making lithium-ion batteries safely rechargeable.

"It's been the most incredible one week of my life," said the professor, who is also director of Battery Programs at NTU's Energy Research Institute.

"I didn't know how important this was until I found out how people were reacting to it," he laughed.

"I've been having phone calls from all over – some at 3am because people don't know the time difference."

The award – named after American scientist Charles Stark Draper – was announced by the Washington-based National Academy of Engineering on Monday.

Prof Yazami's discovery in the 1980s paved the way for lithium batteries to be used in a wide range of appliances such as phones, lap-



PHOTO: TERRAN TANG

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tops, shavers, power tools and even cars.

The lithium-ion battery market was worth US\$12 billion (S\$15.3 billion) last year and is expected to more than double to US\$30 billion by 2016.

The 61-year-old French citizen of Moroccan descent has been a Singapore permanent resident since 2011.

Recounting his discovery to The Sunday Times, Prof Yazami said: "To be honest, it was by chance."

"I was studying the properties and changes in graphite when you put lithium into it."

When he succeeded in inserting lithium into graphite, he discovered that he could also get it out.

This essentially was the basic process that rechargeable lithium-ion batteries undergo. "You store and 'un-store', thousands of times," he explained.

The graphite proved to be a safer alternative to the previous metal negative electrode in lithium batteries, which were prone to short circuits and explosions.

"Yazami's lithium-graphite is the most commonly used anode in commercial lithium-ion batteries today," read the Draper citation.

## Congratulations

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PROFESSOR RACHID YAZAMI, the Cheng Tsang Man Chair Professor in Energy at NTU's School of Materials Science and Engineering, on his win

Prof Yazami shares the Draper, which comes with a US\$500,000 prize money, with three others who contributed to lithium battery research.

They are University of Texas centennial professor of engineering John Goodenough, retired Sony Corp chief technology officer Yoshio Nishi and Asahi Kasei Corp general manager Akira Yoshino.

Prof Yazami would not reveal much about what he is currently working on, except to say that it is on the next generation of batteries, "beyond lithium".

"The lithium electric car can cover 200km per charge. For it to compete with conventional cars, it needs to cover 500km," he said.

"Of course, you can do it with lithium, but you would have to fill the entire car with batteries. So you need something more efficient."

Researchers the world over are working on this too; and the professor would not reveal if he is close to success.

"It's top-secret," he whispered. "But I can say this, We're making progress."

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