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Working on the building blocks for futuristic computer

Dr Yvonne Gao aims to be a leading player in the hardware development of the first full-scale quantum computer.

Dr Yvonne Gao, 33, is developing the key hardware building blocks for the quantum computer – a futuristic computer that is more powerful than today's supercomputers.

A quantum computer will be powered by quantum mechanics, and can speed up computational processes to tackle complex issues such as climate modelling and optimising logistics.

Creating such a supreme computer with robust performance is an active area of research, said Dr Gao, Presidential Young Professor from the National University of Singapore's physics department.

In quantum computers, information is stored in quantum bits, called qubits, and a pair of qubits that interact form the basic processing unit of a quantum computer.

Dr Gao and her team are working on new techniques to implement such units in a highly programmable and robust manner.

"My goal is to be a leading player in the hardware development of the first full-scale quantum computer, and learn more about the fascinating effects of the quantum world during this process," she said.

Dr Gao hopes that quantum computers will drive a new era of scientific discoveries and innovations.

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