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SPINQ

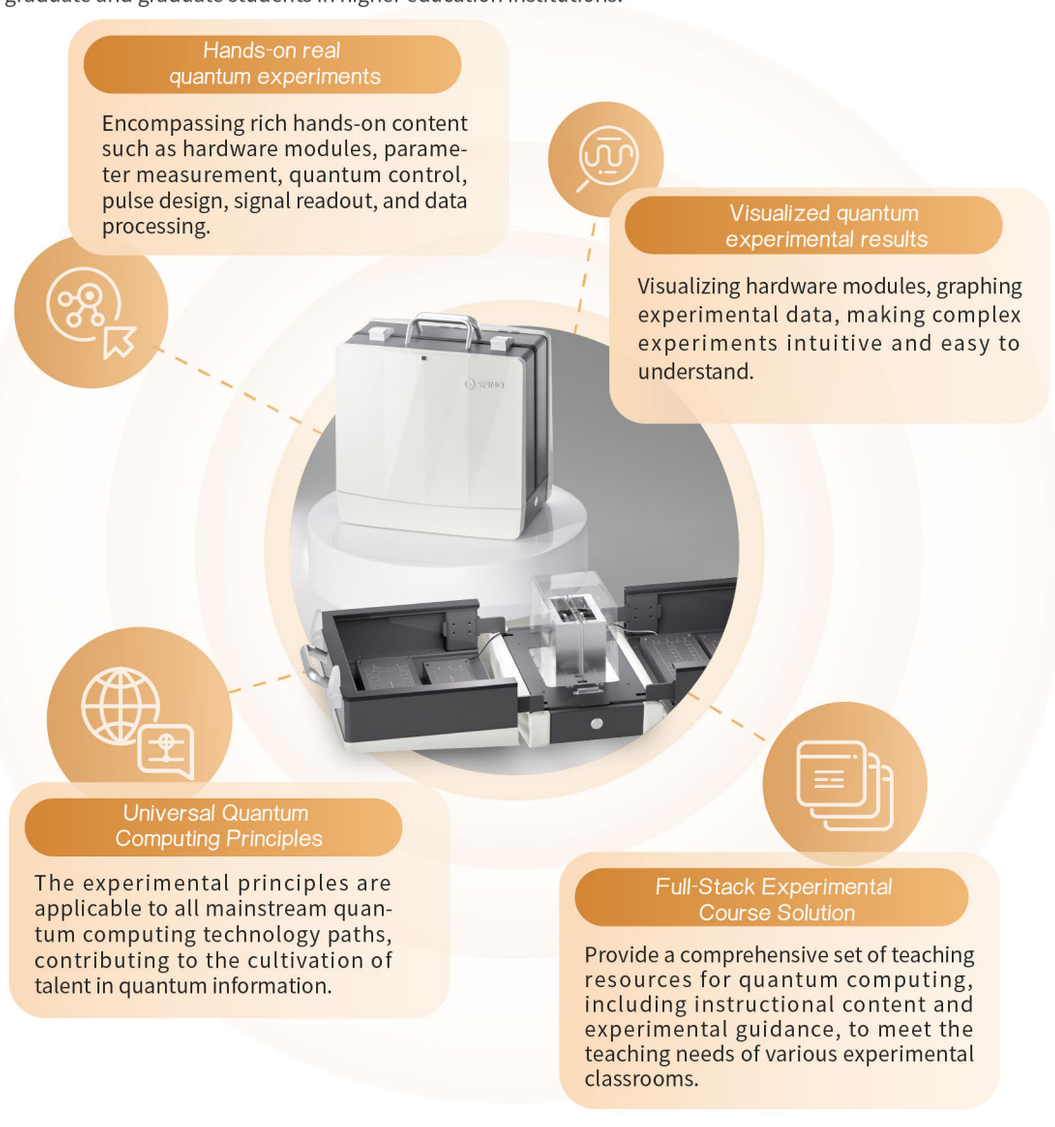
Gemini Lab

Quantum Computing Experimental Platform

Quantum Computing Experiment Platform

Quantum computing is a new computer architecture founded on the principles of quantum mechanics, harnessing the superposition and entanglement of quantum systems to achieve parallel acceleration of computations. As the need for computational power continues to escalate, quantum computing technology has emerged as a strategic focal point in national strategies for information security and industrial competitiveness. In the foreseeable future, it is anticipated to exert profound influences on diverse fields including artificial intelligence, drug development, financial technology, and fundamental sciences.

The SpinQ Gemini Lab is a full-stack quantum computing experimental platform. It is based on the principles of NMR (nuclear magnetic resonance) quantum computing, equipped with advanced radiofrequency technology and miniaturized quantum systems. Capable of conducting real quantum computing experiments in a classroom environment, it is well-suited for use as experimental teaching equipment and a research platform for undergraduate and graduate students in higher education institutions.



Product Advantages

Comprehensive in Content

The experiment includes the foundational principles of quantum computing, control techniques, quantum algorithms, programming languages, research topics, and underlying hardware.

Open Structure

With visible internal structures and operable hardware modules, our quantum computer provides a unique opportunity to understand quantum information technology from a hardware perspective, making it an invaluable resource for users.

Convenient Usage

With its compact size, maintenance-free operation, and room-temperature capability, experience real quantum computing in any classroom setting.

Stable Performance

Benefit from nuclear magnetic resonance, known for superior controllability and prolonged stability - leading the way in quantum computing reliability.

Comparison with Similar Products

	Gemini Lab	Other Similar Products
Real Quantum System	Yes	Yes
Degree of Control	High	Low
Experimental Phenomena	Intuitive	Not Obvious
Experimental Content	Full-Stack	Single
Adaptation Course Type	Variety	Single
Universality of Content	High	Low

Comparison with Simulator

	Gemini Lab	Simulator
Quantum Computing Hardware	✓	✗
Quantum System Parameter Measurement	✓	✗
Radio Frequency Pulse Control	✓	✗
Quantum Logic Gate Construction	✓	✗
Quantum Circuit Design	✓	✓
Real Dynamic Process	✓	✗
Quantum System Signal	✓	✗
Experimental Data Processing	✓	✗
Quantum State Reconstruction	✓	✗
Presentation of Quantum Algorithm Results	✓	✓

Product features

Quantum Computing Principles Experiment

Nuclear Magnetic Resonance & Signal	Observe spin resonance phenomena and measure resonance frequency to understand the physical carrier of quantum bits.
Rabi Oscillation	Observe transition oscillation phenomena, measure Rabi frequency, and explore the rules of RF field driving qubits.
Qubits	Observe the quantum characteristics of nuclear spin and comprehend the physical image of qubits.
Quantum Decoherence	Witness relaxation phenomena, measure decoherence characteristic time, and understand the concept of qubit lifetime.
Quantum Control	Use the RF field to control the state of quantum bits and explore the principle of implementing quantum logic gates.
Quantum System Initialization	Based on controlling quantum bits, implement the initialization process of quantum computing.
Quantum Logic Gates & Circuits	Construct quantum gates based on RF pulses; perform quantum circuit computations based on constructed quantum gates.
Quantum State Tomography	Process readout signals from the quantum system to obtain the output quantum state of the quantum circuit.
Deutsch-Josza Quantum Algorithm	Implement Deutsch-Josza quantum algorithm in the quantum system to experience the parallel computing characteristic of quantum computing.

Product features

Quantum Control Technology

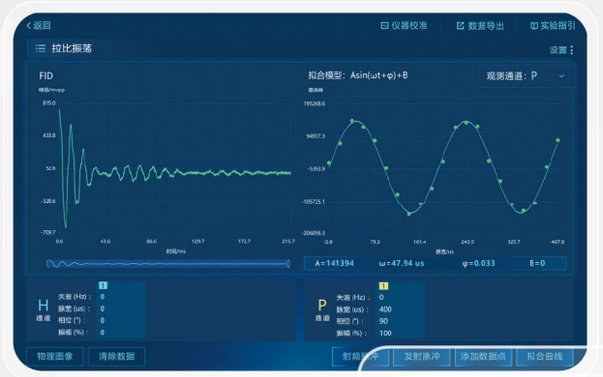
Enhance your understanding of quantum control techniques through methods such as changing experimental samples, utilizing peripheral instruments, and designing pulse sequences. Including independent experiments such as nuclear magnetic resonance spin, spin echo, dynamic decoupling, and shape pulses.

Quantum Algorithm

Learn various quantum algorithms through graphical programming and quantum programming languages, and implement experiments from the physical foundations in quantum systems.

Research-oriented Experiments

Offer various semi-open exploratory experiments, such as quantum optimization algorithms, quantum simulation, and optimization control. It can also serve as a research platform for quantum information.



Quantum Bit
$^{1}H/^{31}P$ atomic nuclear spin

Magnetic Field Strength
0.65 Tesla
27.7 MHz

Size and Weight
991*396*222 (mm)
20 kg

Operating Conditions
0-40 °C
100-240 V AC

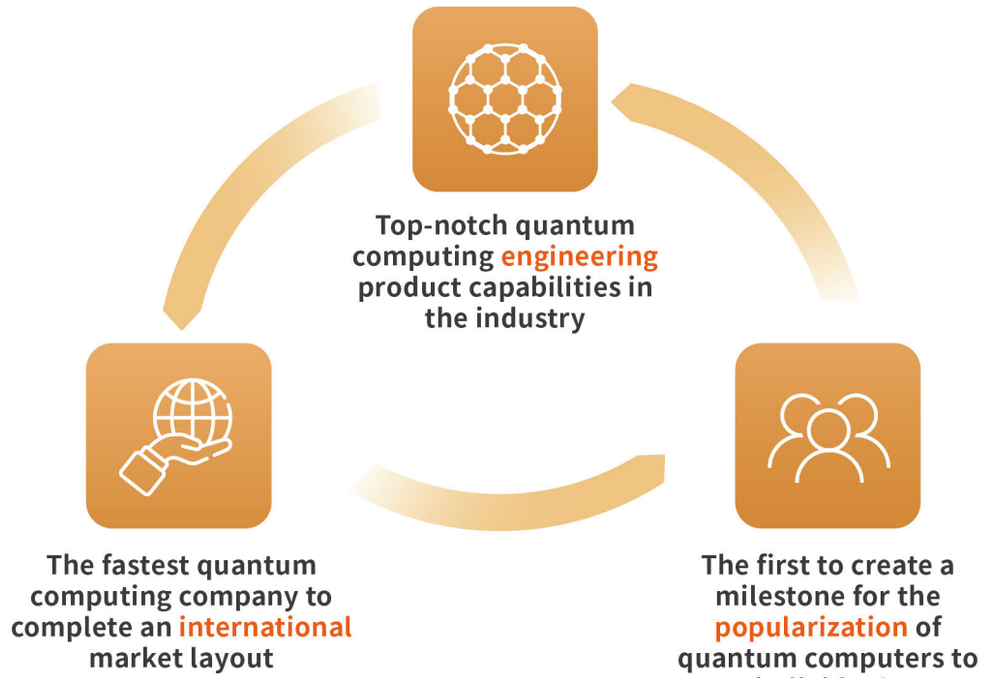
About Us

Founded in 2018

SpinQ is currently **the global leader in quantum computer sales.**
We are a one-stop solution provider committed to **industrializing** and **popularizing** quantum computing.

Under our dual-wheel drive strategy of tech R&D and commercial implementation, we depend on practical superconducting quantum computer, desktop NMR quantum computer, quantum computing cloud platform, and application software for industrial layout. We empower various cutting-edge fields such as scientific research teaching, drug R&D, FinTech, artificial intelligence, and more. We collaborate with partners in building scenario-based solutions, bringing quantum computing into thousands of industries, making it a truly productive tool.

Our Advantages



Development History

2018

August
Shenzhen SpinQ Technology Co., Ltd was established.

November
Completed the development of a large-scale NMR quantum computing cloud platform.

2019

April
Released the prototype of desktop NMR instrument with built-in 2 qubits.

2020

January
Launched the world's first Desktop NMR Quantum Computer (2 qubits) "Gemini".

October
A new generation of general quantum computing cloud platform "Taurus" was officially launched.

December
Completed tens of millions of RMB in Series A financing.

2021

September
Launched Desktop NMR Quantum Computer “Triangulum” with built-in 3 qubits.

December
Our collaboration project with Huaxia Bank won the first prize of the "2020 People's Bank of China Financial Technology Development Award".

2022

January
Launched the world's first portable quantum computer "Gemini Mini" .

March
Passed the national high-tech enterprise certification.

September
Completed nearly 100 million RMB in Pre-B round financing, accelerating the industrialization of quantum computing.

2023

April
Held a strategic conference to upgrade all three major businesses.