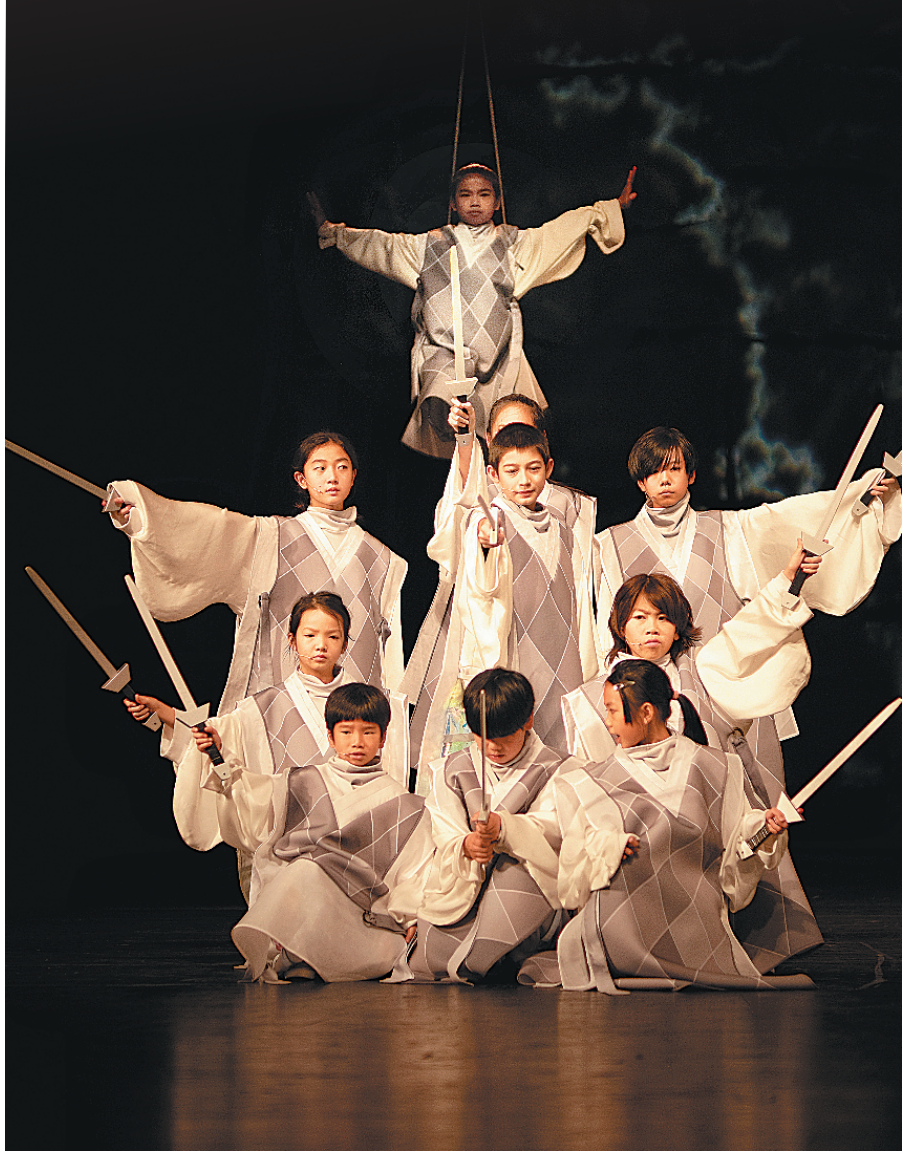
YOUTH

Production is child's play

The National Traditional Orchestra launches theater troupe for youngsters, **Cheng Yuezhu** reports.



The children's play *Compendium of Materia Medica* premiered in January. PHOTOS PROVIDED TO CHINA DAILY

Bencao Gangmu, or Compendium of Materia Medica, a medical encyclopedia compiled by Li Shizhen, a Ming Dynasty (1368-1644) herbalist and pharmacist, has been transformed into a stage play, with science-fiction elements.

The eponymous production, premiered in January in Guangzhou, Guangdong province, was mainly created by children and teenagers of QFun Theater, a children's experimental theater troupe in China. The young members of the troupe wrote the script in nearly 30,000 Chinese characters, as well as composed original songs and choreographed dance pieces for the play.

In their rendition of the ancient Chinese text, the story begins with a futuristic world, where a virtual reality game is developed to help people deal with all kinds of crises. In one game setting, the players are teleported to the Ming era, where they witness the creation of the medical classic.

Xu Xihao, a teenage member of the troupe known as Haohao, is one of the scriptwriters and stage managers of the production.

"I joined QFun Theater in my sixth grade at school, learning the concepts of theater, and how to perform freely and authentically," he says. "It took me more than two years to come to this point, when other young members and I independently created the play."

Prior to the project, he had performed in QFun Theater's other productions, such as *Flowers in the Mirror*, a play adapted from the eponymous Qing Dynasty (1644-1911) fantasy novel and performed entirely by children.

The troupe is dedicated to producing plays from Chinese literature seen from children's viewpoints, targeting social issues such as bullying, prejudice and parent-child relationship.

The new production, coproduced by the troupe, the China National Traditional Orchestra and Guangzhou Opera House, is different from previous productions as it has been written by children, and mixes theater with folk music and kung fu.

It marks the first collaboration of QFun Theater and the youth folk music ensemble affiliated with the China National Traditional Orchestra.

Young instrumentalists from the folk ensemble performed live during the play with *erhu* (a two-stringed bowed musical instrument), *pipa* (a four-string plucked lute) and drums that reenact the ambiance of ancient China.

Following this collaboration, the orchestra and QFun Theater created a youth theater troupe affiliated with the orchestra, aiming to integrate traditional music with theater, and tell Chinese stories from the perspective of children and teenagers.

Zhao Cong, head of the orchestra, says members of the folk ensemble beamed with joy when they dressed in futurist outfits and performed onstage.

"It's extraordinary that children are inspired to transform our ancient classics into contemporary narratives, and promote the stories," Zhao says.

At the youth theater troupe's launch ceremony in Beijing on Feb 19, themed "bringing Chinese stories to the world", the troupe's new productions and tour plans for the year were announced.

The young members of the newly established theater troupe performed excerpts from *Compendium of Materia Medica* at the event, as well as poetry recital of *A Spring Morning* and choir song *Looking for the Moon*.

"Art can help children open up their imagination, and I hope there will be a place where children's creativity can be inspired and exercised. Therefore, we jointly established this youth theater troupe," says Zhao.

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The new troupe plans to take the play *Compendium of Materia Medica* on a tour to Turkmenistan, France and the United Kingdom, as well as major cities in China this year. The troupe's new original play *The Book of Odes*, incorporating traditional music, acrobatics and magic tricks, will also be produced this year.

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East China lab to get world-leading quantum computer

HEFEI — Around a canopy-like freezer hung from the ceiling at a lab in the eastern Chinese city of Hefei, a team of scientists is busy installing a quantum computer.

Li Shaowei has played a major part in this task. The researcher-engineer takes a palm-size cube out of a box. The 3D-encapsulated device, a quantum processor with 176 qubits, is primed to achieve a computational acceleration that is currently not feasible for traditional computers, an ability known as "quantum supremacy". Instead of mazy transistors, this processor contains minutely printed Josephson junctions, a structure less than a micron in size and features a thin layer of aluminum oxide sandwiched between two layers of aluminum.

When the temperature gets close to absolute zero, two aluminum layers will display zero resistance or superconductivity, in a bid to form quantum states that can bolster an exponentially growing calculating capacity. But now, the quantum-based circuit wafer is sealed inside a metal case, with nearly 200 holes allowing connection with the wires dangled down from the freezer above. Standing on a table, Li takes about two hours to complete the connecting work.

During the past six years, more than 10 superconductivity-driven prototypes were created. Among them is Zuchongzhi 2.1, which is currently running and making a repetitive sound at another lab in the building. Zuchongzhi 2.1 is a 66-qubit programmable quantum computing system, made in 2021, which can perform large-scale random quantum circuits sampling about 10 million times faster than the fastest supercomputer at that time.

"Like Zuchongzhi 2.1, the new system has 66 digital qubits plus 110 coupling ones," says Li, who works at the University of Science and Technology of China. "I have to link each qubit with its corresponding wire, otherwise they may lose control."

The team then manages to package the quantum system into variable-sized, Matryoshka doll-like vacuum jars and used liquid helium to help realize an absolute zero working environment.

The prototype computer, in cylinder shape, reminds Xu Yu, a post-doctoral researcher, of Zordon of Eltar, the protagonist in the US superhero TV series *Power Rangers*, who has a head soaked in a jar.

Xu says the system under assembly, a replica of Zuchongzhi 2.1, was projected to be linked to a cloud platform for quantum computing, making it accessible to other research institutions and even the public.

In 2019, Google reported the existence of a 53-qubit superconducting processor called Sycamore that performed the quantum random sampling task in 200 seconds, and the designers said then that it would take the world's fastest supercomputer 10,000 years to produce a similar output.

The 66-qubit Zuchongzhi 2.1 is 1 million times faster than the speed Sycamore could produce in 2019.

"Superconducting computing is a technical route believed to be the best strategy for developing quantum computing to a stage where it can be used for tasks similar to those performed by a general-purpose computer," says Xu.

Another team of scientists from USTC has created a quantum computer prototype, named Jiuzhang, with a photon-driven strategy. Jiuzhang 2.0 was shown in 2021 to have implemented Gaussian boson sampling, a classical simulation algorithm, with 113 detected photons, which was septillion times faster than the world's fastest existing supercomputer.

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These two technical routes have placed China at the forefront of developing and commercializing quantum computing, driving the country to become one of the global leaders in this sector.

China is also home to a number of startups working on quantum technology such as Origin Quantum, a Hefei-based unicorn company that launched OriginQ Cloud, a full-stack quantum computing cloud service platform.

Currently, quantum computers excel in certain less-practical tasks like quantum random sampling and Gaussian boson sampling. In the near future, more practical quantum computers are expected to push artificial intelligence to new heights, and design entirely new materials, chemicals and medicines.

Having achieved "quantum supremacy", scientists in the global quantum computing race are now placing more emphasis on improving the machine's performance by focusing on error-correcting and the qubit's operating life.

"With ever-known algorithms, the high-quality automatic error correction for a quantum computing prototype may require thousands of qubits," says Xu.

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