

# China builds a record-breaking hypergravity machine to compress space and time

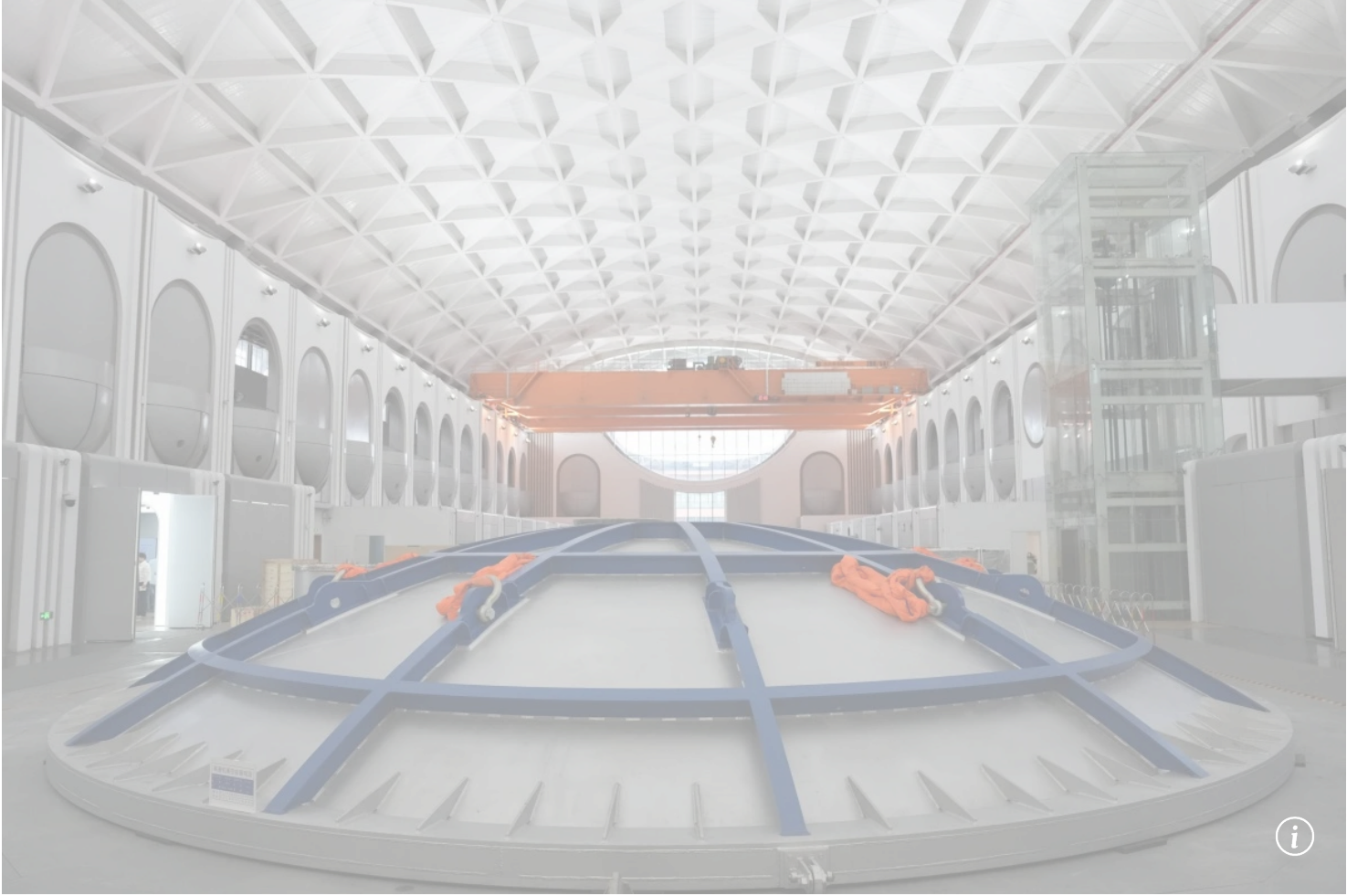
CHIEF1900 will help to recreate catastrophic events such as dam failures and earthquakes inside a lab, university says

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Ling Xin in Ohio  
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China is set to break its own record in [hypergravity research](#) with a colossal new centrifuge that can spin multi-tonne samples at unmatched intensities.

The machine, known as CHIEF1900, is the largest of its kind in the world. It was built by the Chinese Academy of Space Technology (CAST) and is located at the University of Chinese Academy of Sciences (UCAS) in Beijing.

With a capacity of 1,900 tonnes, the machine is designed to simulate the hypergravity conditions experienced by spacecraft during launch and reentry.

and samples. The machine is expected to be operational by September 2026.

Power for the machine is provided by a dedicated power supply system. The machine is designed to operate at a maximum speed of 1,900 revolutions per minute (RPM), which can generate up to 190g of hypergravity.

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Both machines are part of the Centrifugal Hypergravity and Interdisciplinary Experiment Facility (CHIEF), a national laboratory 15 metres (49 feet) beneath the university campus to minimise vibration and ensure stable operation.

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CHIEF1300 dethroned the long-time record holder operated by the US Army Corps of Engineers in Vicksburg, Mississippi, which has a capacity of around 1,200 gtonne. That is in contrast to a household washing machine which rarely exceeds 2 gtonne during a spin cycle.

Approved in 2021 with a budget of 2 billion yuan (US\$285 million), the CHIEF complex is part of China’s broader effort to expand cutting-edge research infrastructure and promote international collaboration. The facility is open to users from universities, research institutes and industries – both domestic and overseas.

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All objects on Earth are subject to gravity and the centrifugal force induced when spinning. By generating forces hundreds or thousands of times stronger than Earth’s gravity, machines such as CHIEF can compress time and distance, making it possible to study phenomena that would otherwise take decades or span kilometres, all within a lab.

For example, to assess the structural stability of a dam 300 metres (984 feet) tall, scientists can build a three-metre model and spin it at 100g. This replicates the same stress levels the full-scale dam would experience in the real world.

Ling Xin

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