

Ideas factories

Nimble, responsive and collaborative, these institutions are growing in strength.

Among the leading young universities (aged 50 years or younger) in the Nature Index, these four institutions stand out. From subject specialists to technology hubs and regional training grounds, they are charting their own course to success.

Pohang University of Science and Technology

At less than 40 years old, Pohang University of Science and Technology (POSTECH) is already looking for ways to reinvent itself. In 2024, it launched its POSTECH 2.0 strategy – a ten-year plan to elevate its global status, supported by 1.2 trillion South Korean won (US\$888.9 billion) in funding, half of which comes from the university itself, and the other half from local and federal governments, corporate backing and donations.

Part of this initiative is to become South Korea's first 'AI-native' university. The plan, announced in July, is to integrate artificial intelligence into all aspects of its system, from research to education. This includes deploying personalized 'AI tutors' to assess learning patterns in real time to help students study more efficiently, and equipping teaching staff with AI tools to monitor students' progress. The initiative will help to prepare POSTECH for "a new leap forward" to meet the challenges of a rapidly changing world, says Sung-Min Park, a biomedical engineer at POSTECH.

Building a future-oriented campus will require close collaboration with industry – something that POSTECH has been set up to do since its inception. Based in Pohang, an industrial hub on South Korea's east coast, POSTECH was established as a research-oriented university in 1986 by POSCO, one of the world's largest steel manufacturers.

Although POSTECH and POSCO operate as separate entities, they remain deeply connected through training and research programmes. In 2022, for example, POSTECH launched a postgraduate course in battery-materials research in collaboration with POSCO Future M, a subsidiary of POSCO. The master's and doctoral programmes allow students to

conduct field research and participate in projects at the company, and guarantee them a job there after graduating.

"Industry collaboration is not just an activity, but part of POSTECH's DNA," says Park. Before joining POSTECH, Park spent more than a decade developing health-care technologies in the United States and South Korea. He now aims to merge that industry experience with POSTECH's research strengths to develop new medical technologies.

In the Nature Index 2025 Young Universities rankings, POSTECH placed 15th overall and 8th in physical sciences. It's also within the top 10 fastest-rising young universities in the biological and health sciences for the period 2023 to 2024.

Since 2018, POSTECH has run an 'open major' system, allowing some undergraduates to choose courses in any fields in the first four semesters of their degree before deciding on their final core subject. In a country where high-school education is heavily focused on college entrance exams, the system helps students to discover what truly excites them, Park says. He adds that the broad understanding that students gain across disciplines is a valuable asset for their future study.

For Joo Yeon Yoo, a cell biologist at POSTECH, one of the university's biggest strengths is its small size. Although several South Korean universities, such as Seoul National University and Yonsei University, both in Seoul, have tens of thousands of students, POSTECH has just over 4,000. Yoo says this makes it easier to collaborate with colleagues in other departments on interdisciplinary research – "a critical factor in producing impactful outcomes". **Xiaoying You**

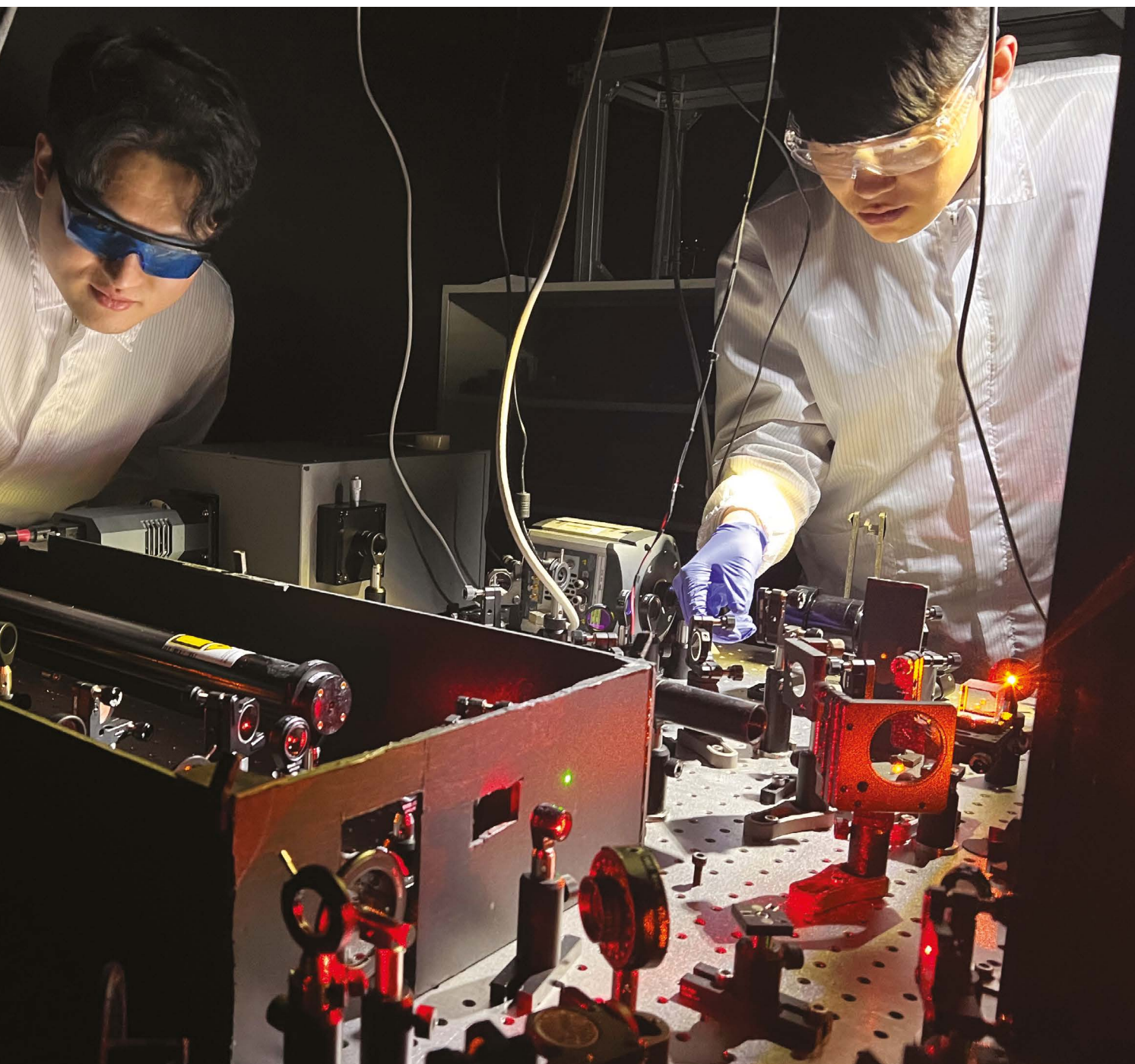
City University of Hong Kong

City University of Hong Kong (CityUHK) has climbed the ranks since it was established in 1994. In the Nature Index 2025 Young Universities rankings, it placed fourth overall, and fourth in the physical sciences. It also placed fifth in chemistry and was the third fastest-rising young university overall.

A major focus of the university is



fast-tracking the development and commercialization of new technologies. One of its flagship initiatives is HK Tech 300, a HK\$600-million (US\$77.22-million) programme that aims to kickstart new businesses based on CityUHK research and technology. Since its launch in 2021, more than 900 start-ups have completed the HK Tech 300 incubation programme, which includes access to resources such as training, workspaces and



POSTECH

POSTECH students use an advanced imaging technique called tip-enhanced nano spectroscopy to study materials at the nanoscale.

legal support, as well as eligibility for up to HK\$100,000 in seed (early-stage) funding. Of those 900 start-ups, 200 have gone on to secure up to HK\$1 million in angel investment (early-stage funding that grants the funder some equity).

One such start-up is Super Bamboo, which produces a sustainable bamboo material with a higher strength-to-weight ratio than steel and titanium, according to company

co-founder and director Andy Ong. Ong is a former research assistant at CityUHK, whose supervisor Lu Yang, a materials scientist, carried out the research that inspired the bamboo material. Super Bamboo went on the market in early 2025, offering products for use in areas such as construction and interior design.

Ong says programmes such as HK Tech 300 are crucial for bringing ideas from the lab to the market. “Everywhere around the world,

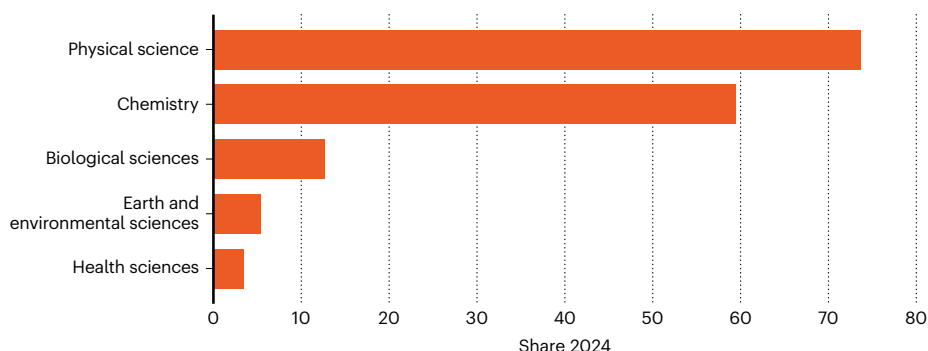
people care more and more about impact and application, not just theoretical research.”

Strong cross-sector collaborations are an important part of CityUHK’s strategy, says the university’s senior vice-president of innovation and enterprise, Michael Yang Mengsu. CityUHK has established partnerships with 19 companies across Hong Kong and mainland China to provide financial support to start-ups via HK Tech 300, he says.

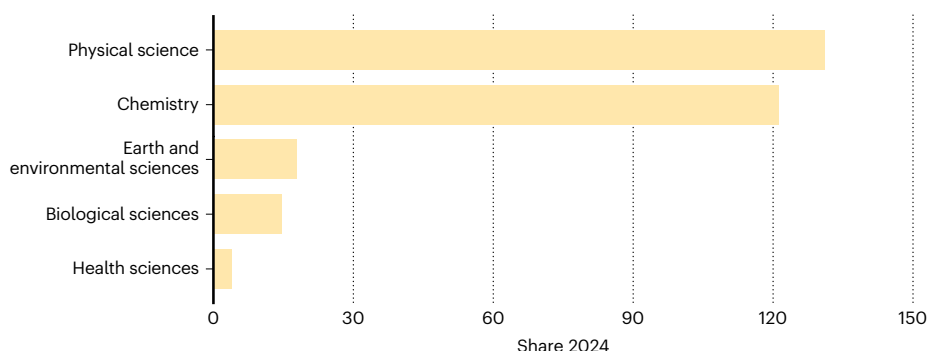
SUBJECT STRENGTHS

A breakdown of selected young universities' (aged 50 and under) Share by subject in the Nature Index reveals where their research strengths lie. The three Asian institutions — Pohang University of Science and Technology in South Korea, IIT Guwahati in India, and City University of Hong Kong — are focused on chemistry and the physical sciences whereas Wageningen University & Research in the Netherlands excels in the biological and Earth and environmental sciences.

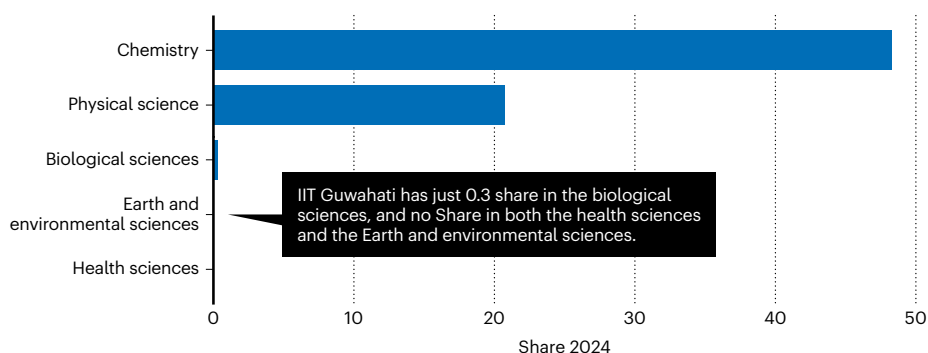
Pohang University of Science and Technology



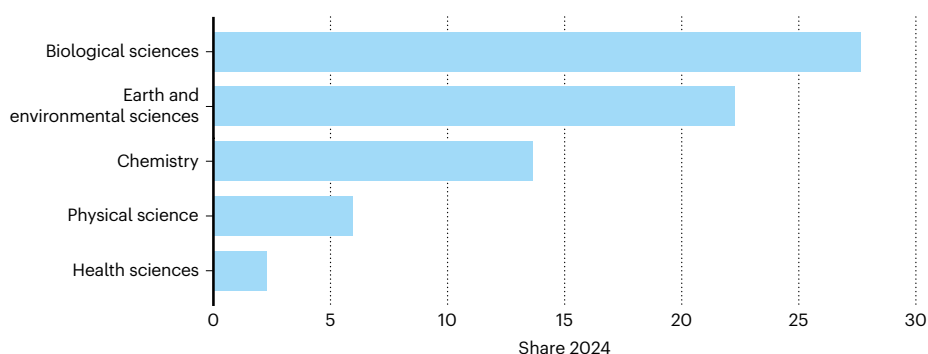
City University of Hong Kong



IIT Guwahati



Wageningen University & Research



The university also has close ties with the health-care sector. In September, CityUHK signed an agreement with Huadong Hospital in Shanghai to establish a joint research institute that is focused on developing new medical technologies, such as surgical robotics.

A key part of CityUHK's draw is the diversity of its people. In 2024 and 2025, it was named the most international university in the world by UK publisher Times Higher Education, which ranks institutions on metrics such as proportion of international students and staff and strength of international collaborations. CityUHK has exchange programmes with roughly 400 institutions around the world, which 65% of its undergraduates take part in.

According to Anderson Shum Ho-cheung, vice-president of research at CityUHK, forging relationships with developing nations is part of the university's goal to ensure that its research responds to real-world needs. In May, the university opened its first central Asian institute branch, the CityUHK Institute for Research and Innovation at Satbayev University in Kazakhstan. The institute offers joint undergraduate and postgraduate programmes, which award students a degree from both CityUHK and Satbayev University in areas such as computer science, architecture and materials science.

Xiaoying You

IIT Guwahati

Founded on the banks of the Brahmaputra River in northeast India in 1994, the Indian Institute of Technology Guwahati (IITG) is one of the country's 22 IITs — institutions that are autonomous of, but funded by, India's Ministry of Education.

The first IITs were established in the 1960s as India's leading research and engineering institutions. Through their foundational charter, the government tasked them with furthering India's national development by serving their local areas as places of scientific excellence. IITG gave itself a broader regional mission: to serve not only its own state of Assam and its neighbouring Indian states, but also parts of Bangladesh, Bhutan and Nepal, whose borders are less than 500 kilometres away.

"We're the only IIT in this part of India," says Gopal Das, IITG's dean of academic research. "IIT Guwahati plays a key role in supporting the research activities of all the other smaller institutes in this region."

This support involves hosting academics and students from nearby areas and making sure the partnership feels mutually beneficial, says Das. The visiting researchers bring samples and data to collaborate on and IITG

offers training, such as how to use its scanning electron microscope, nuclear magnetic resonance machine and other specialized equipment.

"We give a free hand to all the PhD students to use the equipment," says Das, adding that other Indian research institutes tend to be more restrictive with their facilities. "We give all newcomers hands-on training for three to six months, depending on the importance of the instrument. Then we test them and allow them to operate independently." This creates more autonomous and competent researchers, says Das, and because many students stay on as postdocs, IITG benefits from a higher quality of research output.

In the Nature Index 2025 Young Universities ranking, IITG ranked second in India (after Homi Bhabha National Institute in Mumbai) and 35th globally. It also ranked 27th in chemistry globally – a strength that chimes with India's research performance more generally: in 2023, almost 60% of India's output in the Nature Index was chemistry-related.

IITG's focus on the personal development of its researchers and students extends to the institute's management structure. For example, each PhD student has two supervisors who must come from two different departments. This set-up encourages the students to think in multidisciplinary terms, says Das, which strengthens their work. "Students now want to learn multiple things at the same time – one person doing a chemistry PhD simultaneously wants to learn AI or machine learning," says Das. "That's our edge."

Benjamin Plackett

Wageningen University & Research

Wageningen University & Research (WUR) in the Netherlands punches above its weight in environmental science. In the Nature Index 2025 Young Universities rankings, WUR placed 8th for Earth and environmental sciences – the only institution outside of China to make the top 10 – and 38th overall.

The university operates with just one department, which houses eight research institutes, each one focused on a theme, such as animal science, food safety and marine research. This centralized structure is run by a small team of managerial and senior administrative staff who grant the university's researchers a lot of freedom, says WUR virologist Wim van der Poel. "Professors have full autonomy to direct their research and choose what's good or bad for their work," he says. Van der Poel is the co-author of a 2021 paper that describes the transmission of the COVID-19 virus between

humans and minks – one of the most cited research articles from that year among Nature Index papers involving young universities (B. B. Oude Munnink *et al. Science* **371**, 172–177; 2021).

WUR's streamlined administration also makes it relatively easy to assemble research teams across different fields, says van der Poel. This allows WUR, which achieved university

"A person doing a chemistry PhD simultaneously wants to learn AI or machine learning. That's our edge."

status in 1986 but has a history stretching back to 1876, to operate as both a specialized and interdisciplinary institution.

Location matters, too. Wageningen is a rural town, located within a river-laced patchwork of woods and flatlands with university-owned fields that double as living laboratories. Those plots have seen decades of crop experiments and environmental monitoring, and many are within a bike ride of campus. "It's a pleasant environment to live in," says van der Poel.

The campus is close to major agribusinesses with which many WUR researchers collaborate. The Dutch research headquarters of

British consumer-goods giant Unilever are nearby, "which isn't a coincidence", says van der Poel. "It was a decision by the university and the company to have a good exchange of researchers and students." Dutch dairy company FrieslandCampnia is another frequent collaborator, with an innovation centre located just a few minutes' walk from WUR's main campus.

The university also has a close working relationship with the Dutch government, and often provides researchers to perform data collection and species monitoring in local nature reserves, says van der Poel. "Since we can work closely together with these nature reserves, we can produce very original papers." In August, van der Poel and his colleagues published a paper about pathogen monitoring in Dutch nature reserves (I. Marcelino *et al. Transbound Emerg. Dis.* **2025**, 6948049; 2025).

In 2025, WUR was named the top university in the Netherlands for the 20th consecutive year, based on the results of a national student survey. "I think the reason for that is because the university really puts a lot of effort into the training programmes for students," says van der Poel. "They can tailor their own degree by picking the subjects that they find interesting."

That attitude helps with talent retention, he adds. "A lot of students stay for master's studies, PhDs and postdocs." **Benjamin Plackett**



Wageningen University researcher Ingrid van der Meer studying water lentils, or duckweed.

Correction

This Nature Index article misdescribed the status of the CityUHK Institute for Research and Innovation.