RESEARCH ON A SHORT LEASH

TEXT: MARCEL GRZANNA

Democracies are thought to be the centers of groundbreaking research. However, the People's Republic of China is upending the free world's perception of itself. Despite its increasingly totalitarian structures, the country has joined the leading group of scientific nations. Under the direction of China researcher Anna Lisa Ahlers, a group from the Lise Meitner Program is attempting to determine how this is possible.

For a few decades, the democratic word held on to the view that, just as rainforest vegetation flourishes in a tropical climate, science flourishes in freedom. Only where a liberal spirit prevails can research tread its unpredictable but steady path like water through the ground. The conviction was based on more than just dogma. The sociologist Robert K. Merton had already defined four characteristics of true science back in the early 1940s. He argued that universalism, equality, altruism, and skepticism are necessary for continually achieving new scientific milestones. Merton was convinced that only democratic societies could provide these ingredients.

A good 80 years later, Anna Lisa Ahlers sits in her Berlin office at the Max Planck Institute for the History of Science. "A few things have changed. We have to take a close look at the developments of the past few years," she says. Ahlers is a China researcher. She spent several years in the People's Republic and speaks fluent Mandarin. Now she heads the Lise Meitner Research Group "China in the World System of Science."

When the call for applications for the 2019 program landed in her inbox, she was sitting in the library at the University of Chicago as a visiting professor – ready to give up a tenured position in Oslo for an opportunity to go on an intensive hunt for clues. Her application for the Lise Meitner Program of the Max Planck Society struck a chord with the zeitgeist.

"The overriding question for us is how science works in an authoritarian system," she says. This is because, with the entry of the People's Republic of China into the leading group of global scientific nations, Robert K. Merton's social theory is beginning to falter. Nothing that was once thought to be a prerequisite for thriving research exists in China in its purest form, and some of it does not exist at all. In addition, the political structures in China have become increasingly totalitarian since party leader Xi Jinping took office more than ten years ago. For the Chinese Communist Party, everything is subordinated to maintaining its monopoly on power in a single-party state. This also applies to

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science, which must always serve the party and not contradict its ideology under any circumstances. What makes science in the People's Republic of China internationally competitive despite the CCP's strict control over it? This question is on Anna Lisa Ahlers' mind, not least because she has been observing this development from close quarters for some time. China not only wants to keep up with the nations who have been the frontrunners in science until now, above all the US, but also some European countries: the People's Republic wants to outdo them all. Abundant data sources, relevant publications, state-of-the-art research centers, internationally renowned award ceremonies – all this could shift increasingly to the Far East if the country succeeds in its confidently stated goal of becoming the leading scientific nation in the world.

Meanwhile, there has been a sharp rise in interest in Chinese science. Media attention has also increased dramatically since China's universities started to publish more and more research results. Just recently, the People's Republic of China surpassed the United States in terms of the total number of publications in scientific journals. The goal of achieving a high position in such rankings is set for Chinese research organizations and universities by policymakers, as the researchers in the Lise Meitner group make clear. In an incentive-based system, the leaderboard becomes the outstanding benchmark. "This is why it's much easier for Chinese universities, for example, to adjust to the international rankings," Ahlers says.

First quantity, then quality

However, first place in the number of publications is only a partial victory for the People's Republic. This is because the criteria used to judge whether scientific research is successful not only include the number of journal articles, but also, for example, the importance of the journals in which they appear or the frequency with which scientific papers are cited by other research groups. Meanwhile, for universities, students' assessment of how well they are supervised is also considered a mark of quality. When it comes to factors such as these, many Chinese research facilities are still struggling. In the QS World University Ranking, for example, which takes into account the academic reputation of universities and the ratio of faculty to students, Chinese universities have yet to achieve top rankings. However, the universities of Beijing and Tsinghua still landed among the top 20, which already puts them ahead of German universities. The best German universities here are the TU Munich in 37th place, the Ludwig Maximilian University of Munich (54) and the University of Heidelberg (87). For many observers, the increasing number of high-level publications and the steadily improving placements in rankings is a sign that

SUMMARY

China wants to become the leading scientific nation on earth. The country's research facilities already publish the highest number of scientific articles. However, the quality of the articles is still mediocre in many cases.

The former maxim of "learning from the West" is increasingly being replaced by China's aspiration to emerge as an independent player in science. However, a "Chinese model" is not yet discernible

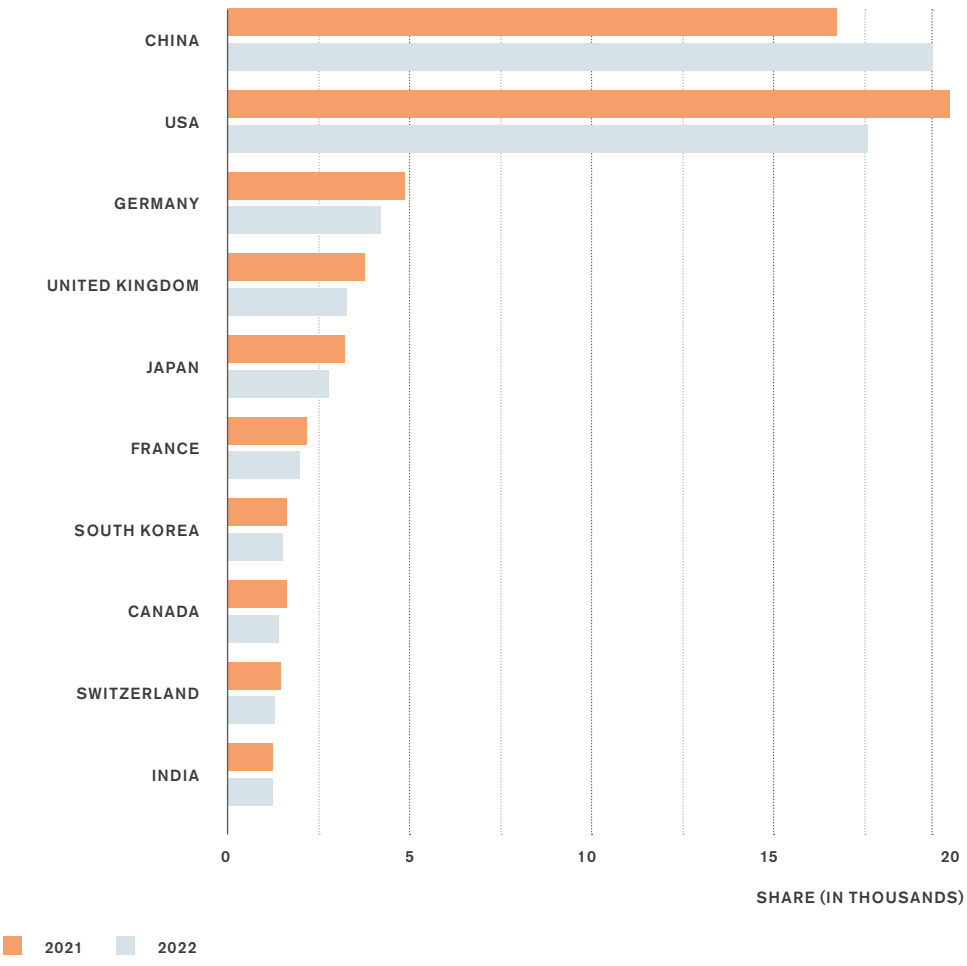
Under Xi Jinping's leadership, the state is once again exerting a much stronger influence on science than it did under his predecessors. Goals are often set by the state once again.

Massachusetts Institute of Technology (MIT)
University of Cambridge
Stanford University
University of Oxford
Harvard University
California Institute of Technology (Caltech)
Imperial College London
University College London
ETH Zurich – Swiss Federal Institute of Technology
University of Chicago
National University of Singapore (NUS)
Peking University
University of Pennsylvania
Tsinghua University
The University of Edinburgh
EPFL
Princeton University
Yale University
Nanyang Technological University, Singapore (NTU)
Cornell University
The University of Hong Kong
Columbia University
The University of Tokyo
Johns Hopkins University
University of Michigan-Ann Arbor

GRAPHIC: GCO BASED ON A TEMPLATE BY QS WORLD UNIVERSITY RANKINGS 2023

Ranking of top universities: The QS World University Ranking is based on the analysis of criteria such as academic reputation, number of international students and international research networking. The top 10 still includes only US and European universities.

China is on the rise, while Western countries are losing ground. The Nature Index tracks authors of research articles published in 82 selected high-quality natural and health science journals. The graphic shows each nation's contribution to the index based on the percentage of researchers who are listed as authors on each article. China gained 2600 points between 2021 and 2022, while the US lost 2200 points, ceding its leadership position to the People's Republic. The amount of articles from other Western countries has also fallen.



GRAPHIC: GCO BASED ON A TEMPLATE BY NATURE INDEX, ANNUAL TABLES 2023

the quality of research and teaching in China continues to rise. Ahlers' team is now investigating whether this is really the case.

Few research groups have examined the success of autocratic science in recent years as closely. Ahlers is getting to the bottom of the phenomenon using classic social scientific basic research. "We want to understand how scientific structures have developed in China and what influence the social environment has on research in the country," she says. Social science has already explained how China is able to succeed despite restrictions on free science thanks to its strong international connections, particularly with Western researchers. Now, however, the maxim "learn from the West" is no longer set to apply without restriction in the country. It wants to put its own stamp on things, such as having its own scientific publishers or withholding resources like research data. This would reduce the significance of international cooperation.

The Max Planck Group is therefore investigating the state of international networking. Anna Lisa Ahlers and her team not only analyze publications, as other researchers have done, but also look at the personal profiles of the Chinese scientists: their presence at international conferences or their educational background. The significance and forms of international networking are changing, to be sure, as the team has already established in its research. For example, Chinese scientific publishers and domestic dissemination of research results are becoming more important. "But there is no sign of a Chinese model yet," says Ahlers. The government's account of its own model therefore does not yet stand up to reality. Instead, the country continues to rely on international connections, while at the same time aiming to create new capacities and setting its own standards. Another aspect of international networking is the attractiveness of Chinese research facilities to foreign researchers. Despite the political circumstances, this attractiveness is fairly high because research projects are financed with extensive outside funding and laboratories are well equipped. The conditions under which European researchers work at Chinese universities are also a topic for Ahlers' team. The data so far shows that,

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Mao statue and party slogan on the campus of Tongji University in Shanghai: "Learn the thoughts [of Xi Jinping] to strengthen the party spirit. Put practice to work to achieve new successes."

PHOTO: ANDREA BROWN STŘELCOVÁ

although their numbers have increased, only very few researchers want to stay in China for the long term. "China is becoming more attractive, but only up to a point," Ahlers says.

Problems such as air pollution or the circumstances of family life discourage many foreign researchers from making a long-term commitment to the People's Republic – despite the high budgets and modern laboratories. In contrast, the group found that Chinese students are now somewhat less likely to be drawn to study abroad. The pandemic played a role here, but so did increasing geopolitical tensions between the People's Republic and the West. In addition, as Chinese educational opportunities have improved, young Chinese people are staying put more often – and this is also for cost reasons. This development could promote the emergence of a Chinese model.

African research without the colonial baggage

The researchers look at very different disciplines in their studies. This ranges from the humanities and social sciences to agriculture, climate research, and computer science. For example, they are interested in the debates surrounding the use and devel-

opment of artificial intelligence. The team is examining whether, for instance, there are less stringent ethical standards for artificial intelligence (AI) research and development in China than there are in Europe. This has led the researchers to conclude that the differences in scientific approaches to AI and its development to date are not necessarily due to different ethical and moral standards. It rather found that Chinese AI research is under high pressure to publish results and also commercialize them.

Part of Ahlers' group also conducts research on Chinese regional studies in Africa, for example, focusing on the researchers' approach and the interaction of their research with the country's foreign policy. The official interpretation of the Chinese studies is: our African studies are free of colonial baggage. The Max Planck projects in this area will shed light on whether the claim is true and how this attitude and other, possibly political, motives are reflected in the work of Chinese researchers on other world regions. But the researchers are also concerned with the question of how significant China really is as an intellectual player on a global level.

In general, the relationship between science and politics plays a major role in the work of the research group. The team therefore also analyzes the period before Xi Jinping became the most powerful person in China and took tight control over the state and society. Under Xi's predecessors Jiang Zemin and Hu Jintao in the 1990s and 2000s, researchers enjoyed greater autonomy than they do today. This is also evident in the academic think tanks in China. For years, think tanks enjoyed relatively broad freedom; today, they are to a large extent exclusively affiliated with universities or government agencies. In addition, their work is now subject to greater restrictions. According to Anna Lisa Ahlers, think tanks no longer have as much access to comprehensive data as they once did. Additionally, the government's willingness to be openly consulted has decreased, as have the opportunities to share information and proposals with it. As a result, discussions about political issues and reform strategies are becoming less multifaceted.

The overall situation for researchers in China has gotten much worse, and goals are increasingly being formulated at the state level to a much greater extent than ever before. Science searches for solutions with a strong emphasis on pragmatism. Until Mao's death, scientists were "partially paralyzed" by strong ideological control and lack of resources. This changed in 1978 with the implementation of Deng Xiaoping's policy of Opening-up, which emphasized a comparatively liberal approach toward science as a means to modernize the nation. Since Xi Jinping became head of the party, he has consistently emphasized the significance of scientific and technological advancement for China's rise on the global stage, as well as the need for the party to exercise complete control over these developments. In fact, Ahlers is once again seeing significantly more caution among Chinese scientists in their dealings with politics as well. The resulting questions are: Do scientists discuss what they are researching? Do they present their theses to party cadres, or do they prefer to say what these want to hear? And what are the consequences? Moreover, the increased politicization of science suggests to international partners that researchers from China often travel with a dual role, especially abroad. In addition to their research questions, they are also expected to keep China's interests in mind. What evidence is there of a political mission that need not even have been explicitly issued?

It is not easy to gather evidence for such sensitive topics. Anna Lisa Ahlers' group uses methods such as interviews to collect data. However, there has been growing skepticism and concern among interviewees about talking to foreigners at all. The researchers therefore supplement their findings with media reports, political documents, and as diverse a range of other material as they have access to. Other barriers to research exist as well, some of which are very practical. The Covid-19 pandemic, for example, made the task much more difficult. The group had actually planned to participate in regular research residencies in China. Ahlers herself was able to travel to the country for the first time in years in late summer of 2023. Her plan to accompany parts of a Chinese polar mission, which aimed to investigate the link between scientific and political-diplomatic tasks, also had to be canceled. To investigate this topic further, part of Ahlers' team is now analyzing the publications of Chinese polar researchers in more detail.

China research should become interdisciplinary

In addition, Ahlers believes there are challenges for China research as a whole. "To ensure access to the field, I think that research on important topics must be conducted using an interdisciplinary approach." People who study China's climate from a sociological or cultural science perspective, for instance, increasingly need to participate in on-site expert discussions that, ideally, include specialists from meteorology, atmospheric chemistry, and other fields. Ahlers' previous experience has shown that all those involved can benefit from this. She says that this is also an opportunity for the natural science disciplines to gain additional access and to better contextualize and control data. Ahlers also advocates strengthening internationally comparative projects to make research on China less exoticized and to make findings more generalizable. "It would be good for China research to develop in this direction. But this is of course an additional component that presents a challenge," says Anna Lisa Ahlers. Even so, she concludes, the Max Planck Society offers her excellent opportunities to meet this challenge.

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