

Global Science Needs Teamwork

Four decades ago, the **Chinese Academy of Sciences** and the **Max Planck Society** established their scientific cooperation. Since then, these collaborative ties have been continuously strengthened. The Presidents of both research organisations, **Professor Bai Chunli** and **Professor Peter Gruss**, look back on the development of earlier decades, highlight past success and future challenges – and underline the importance of cooperation in the new times of globalisation of science.

CAS and MPG have been working together for 40 years. How has cooperation changed over this period?

BAI: The speed and extent to which cooperation has developed is remarkable. The situation in China – in light of its enormous need to catch up and its absolute desire, but also necessity, to join the international community in terms of research and technology – has certainly contributed to this. Soon after the Academy's establishment, CAS mainly cooperated with Soviet and East European institutions. In the 1970s, China intended to resume development. Cooperation between CAS and MPG started in 1974 and was well-suited to this intention. Such a scientific cooperation pioneered China's opening up to the West. In the early years, CAS leaders such as Professor Wu Youxun, Professor Yu Wen and others, made a big contribution to the development of bilateral collaboration.

I have to say, international cooperation not only promoted the development of science within CAS but also facilitated our institutional change. My predecessors in this position, Professor Zhou Guangzhao and Professor Lu Yongxiang, transformed CAS into a modern, internationally competitive research institution through a set of far-reaching reforms and initiatives. The Max Planck Society has proven itself to be an outstanding partner. I suppose MPG must have sharply sensed the change in China at that time, in 1974, and then reached out to China and CAS and focused on CAS. Both sides made a smart decision.

GRUSS: I can't really overstate the importance of the decision of former Max Planck President Reimar Lüst to initiate contact with CAS. Our cooperation started with an exchange of just ten scientists per year. Today, we not only have a joint Partner Institute in a strategically important research field, we also jointly identify future research topics through the Exploratory Round Table Conferences on a regular basis. In addition, we have established successful programmes for the joint career development of junior scientists. More than ten per cent of our international visiting scientists – i.e. over 800 mainly young researchers at our institutes – come from China. About half of these are from CAS, while the remainder comes from elite Chinese universities. China therefore has an enormous presence at our institutes. And many key positions in China are held by alumni of the Max Planck Society. Also, an impressive number of CAS directors are scientists who received their training at a Max Planck Institute in Germany.

So there has been a major intensification in cooperation – but to explore Mr Bai's point in greater depth – why did the Max Planck Society focus on CAS at such an early stage?

GRUSS: I only recently spoke to Mr Lüst about this historically significant establishment of contact and his reasons for initiating such a relationship. During that period, science played a pioneering role in the relations between the People's Republic of China and the Federal Republic



»» We are seeking to build upon this foundation in order to jointly make strategic decisions in future.

Bai Chunli and Peter Gruss during a meeting at the Administrative Headquarters of the Max Planck Society in Munich.

lic of Germany. Professor Leussink, former Minister of Science, established the initial contact through his connections with the Krupp Foundation and Professor Beitz. At the time, only very few people were aware of China's potential and of the possible significance of this collaboration. In 1974, the German Ambassador Rolf Friedemann Pauls provided an insightful explanation during the now legendary first visit to China by an MPG delegation under President Reimar Lüst: "The Germans and the Chinese are the only people who can pride themselves on having discovered gunpowder; only the Chinese discovered it a few centuries earlier. The same is true for both countries as regards the art of book printing and the production of porcelain. Such gaps in knowledge caused by a lack of contact should be avoided in the future." This is where the motto of our cooperation comes from – direct dialogue between scientists is the key requirement for the acquisition of knowledge. Only many years later, the public began to realise the political and economic dimension as well as the relevance of this first contact-making trip. Fortunately, we had strong supporters of the expansion of this cooperation in the 1980s in the Secretary Generals Dietrich Ranft and Yu Wen.

How is this early period seen from a Chinese perspective?

BAI: In the early years, those scientists who studied and worked in Germany made an important contribution to building the relationship. For instance, one of China's most well-known nuclear physicists, Professor He Zehui, and Professor Wolfgang Gentner, former Vice President of MPG and former Director of the Max Planck Institute for Nuclear Physics, had worked together in Germany in the 1940s. Later they met again in 1974 in China and this reunion initiated a close collaborative relationship in high energy physics between CAS and MPG. Of course, the more common cases were scientists who had no prior contacts. The desire to advance through collaboration brought them together despite initial unfamiliarity and some historical and cultural issues. I am thinking of pioneers who I also knew personally, such as Professor Uli Schwarz and his colleague Professor Zhuang Xiaohui in Shanghai who set up the first Max Planck guest laboratory in 1985. This facility gave young Chinese scientists the opportunity to continue the work they had begun in Germany or in China.

In addition to the progress facilitated by cooperation in research, of course the early CAS leadership also showed far-sightedness and made an important contribution to our collaboration. The CAS Vice President at that time, Professor Wu Youxun, met with the MPG delegation first. They reached a verbal agreement on the establishment of a partnership on the basis of equality and mutual benefit, which subsequently becomes the fundamental principle insisted upon by later presidents. In the words of then CAS President Fang Yi: "Precious pearls should be exchanged for gems of equal value."

Milestones of Cooperation



1974

MPG President Professor Reimar Lüst (r.) and CAS Vice President Professor Wu Youxun lay the foundation for cooperation at their first meeting in Beijing. In the beginning, the exchange of scientists was strictly controlled. Today, there are over 800 visiting scientists from China working at Max Planck Institutes (MPIs).



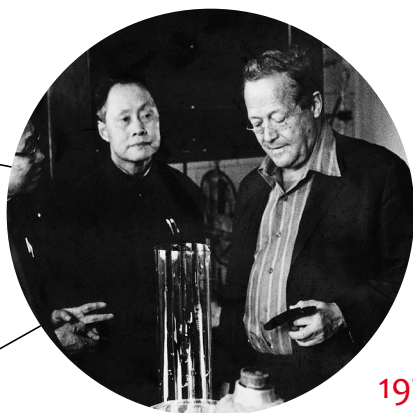
1985

The cooperation first achieves international visibility through the Max Planck guest laboratory in Shanghai, which was inaugurated by Professor Zhang Xiaohui (l.) and MPG Secretary General Dietmar Ranft.

To mark the 20th anniversary of their cooperation, CAS President Professor Zhou Guangzhao (l.) and MPG President Professor Hans F. Zacher meet in Munich to discuss the modernization of the Chinese scientific system and the remodelling of the German research landscape as a result of German unity.



1994



1974

It is the scientists themselves who bring the cooperation on specific projects to life. Professor Feodor Lynen (r.) and Professor Wang You knew one another as students in Europe in the 1930s.



1987

With a focus on targeted support for junior scientists, the contract is extended by Presidents Professor Zhou Guangzhao (r.) and Professor Heinz A. Staab.

Mr Gruss – do you have recollections of cooperation from the time before your presidency when you were still conducting research as a Max Planck Director?

GRUSS: In the mid-1980s, I was at the guest laboratory myself, and I clearly remember the difficult conditions under which researchers in China had to work at the time. Within the Max Planck Society, there were a number of scientists who strongly advocated collaboration with China, especially in fields such as biochemistry and materials research. As China always had been traditionally strong in these two areas, in which it also had an economic interest, good starting points for collaborative endeavours already existed in these fields. Professor Peter Hans Hofschneider trained an entire generation of Chinese molecular biologists at his institute in Martinsried, which today hosts the third-generation of Chinese doctoral students. The Max Planck institutes in Stuttgart were one of the key footholds for junior scientists in materials research. Our scientists Professor Günter Petzow and Professor Manfred Rühle, just to mention a few names, laid the foundations for our Partner Groups today. The Fritz Haber Institute produced pioneering work with Professor Gerhard Ertl and others. And we shouldn't forget to mention that the Alexander von Humboldt Foundation and the German Academic Exchange Service (DAAD) also made a major contribution to the cooperation's development through their grant programmes. A special feature of our agreement was the longstanding co-representation of the German Research Foundation (DFG) and the associated involvement of the German universities, which used unique Chinese resources for fieldwork and expeditions, particularly in the geosciences.

Mr Bai, the Partner Institute in Shanghai has already been touched upon. This took cooperation to a new level ...

BAI: Exactly – ten years ago, on the 30th anniversary of our cooperation, we decided to attempt a major experiment and founded a joint Partner Institute in the field of computational biology, PICB. CAS wanted to test new models for a leading international research organisation and to strengthen its international orientation. For example, in parallel with PICB, we also founded a joint institute with the French Pasteur Institute in the field of infectious disease prevention and control. PICB serves as a model for China in many respects as it introduces entirely new forms of research management, such as collective leadership of the Institute by several directors, international calls for applications for director positions and evaluation by an international, independent Scientific Advisory Board. From the perspective of CAS, this experiment has proved extremely successful and we are delighted with the experience we have acquired. The Institute has positioned itself outstandingly well scientifically and is a guiding light for CAS's international institutional cooperation.

This attempt also meets the internal demands of CAS. After the past 30 years of development, CAS aims to become a world-class research institution and we are putting much emphasis on internationalization of our research and education. Yet, how to improve the internationalization of CAS and enhance international cooperation is a crucial challenge facing us. Therefore, I am very glad to see the positive experience gained from PICB.

Mr Gruss, when Mr Bai talks about an experiment, scientists always consider the possibility of failure. How big was this risk?

GRUSS: As regards the foundation of PICB we were able to take this risk because we had already put into practice the key elements required for implementation of such an enterprise with CAS. Since 1995, we have realised the model for Max Planck Independent Junior Research Groups in Shanghai and later also in Kunming. The idea was to recruit outstanding young international scientists and provide them with the opportunity to qualify for leadership positions in 5 to 7 years. The Leader of the first MPG Junior Research Group, Pei Gang, is now the President of Tongji University. International calls for applications, selection symposiums, evaluation by an international Scientific Advisory Board and, above all, scientific and financial independence – all of these are elements which we jointly implemented at the Partner Institute. However, another factor of success was the financial support from the German Federal Ministry of Education and Research, which continuously and generously funded our cooperation from the outset.

How do you view the development of the Partner Institute?

GRUSS: PICB is well established internationally. By addressing the subject of computational biology, it is focusing on a research field with tremendous prospects. The results of the most recent international academic evaluation of PICB were also extremely satisfactory. The Institute has made excellent scientific progress: It publishes in the top international journals and has built an international position for itself. Above all – and this is important for the future of PICB – it enjoys a good reputation among young people due to its highly international orientation, its large number of international staff members and its excellent equipment. I am very confident that PICB has a great future lying ahead of it because its scientific field is evolving rapidly, and we have put the relevant structural and financial basis in place.

BAI: I totally agree. MPG and CAS have reason to be proud, but they must also continue to work meticulously to maintain a balance between their still very different systems and cultures, and to achieve the goal of do-



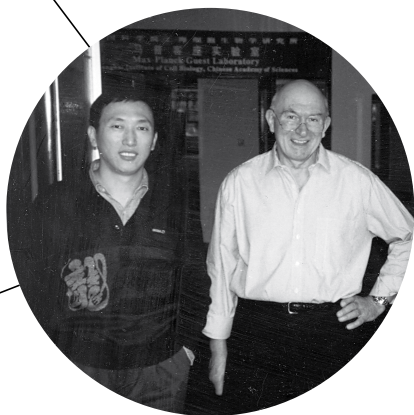
1999

Presidents Professor Hubert Markl (r.) and Professor Lu Yongxiang agree to set up MPG Partner Groups in China. This enables Chinese junior scientists to maintain ties with their host institute and continue their research in their home country following a period of residence at an MPI. Support has so far been provided for over 30 such Groups.



2001

China becomes the first stop outside of Germany for the Max Planck Science Tunnel. The multimedia exhibition was presented for a second time in Beijing and Shanghai in 2006. To mark the 40th anniversary of cooperation, version 3.0 is visiting China once again.



1995

Upon the initiative of Professor Uli Schwarz (r.), the first Independent Max Planck Research Groups are established in Shanghai. For many Group Leaders, such as Dr. Pei Gang, they became a springboard to a future career. Today, he is the President of Tongji University.



2001

With the foundation of the Shanghai Institute for Advanced Studies (SIAS), pioneering Professor Uli Schwarz establishes a platform which has since served as an ongoing interdisciplinary scientific dialogue.



2003

Bilateral talks in Shanghai provide an opportunity for scientists and heads of both organisations to discuss new perspectives – among them are Professor Gerhard Wegner, China-Commissioner and former MPG Vice President (l.), and former Vice President of the CAS, Professor Chen Zhu.

ing excellent research. There have of course also been setbacks over the past ten years. During these periods, it was vital that the cooperation was structured on the basis of equality and mutual benefit from the outset, which was very important for China. One quality that I greatly admire in the Max Planck Society is the persistence with which it pursues this cooperation – sustained, relentless continuation, even in times of difficulty or when not everything was going according to plan.

How important is the role of junior scientists in the cooperation?

BAI: The leadership of CAS always attaches great importance to the training and recruitment of young talent. We initiated some specific measures to attract more outstanding talent from overseas. In fact, I was responsible for overseeing talent programmes during my term as CAS Vice President, including the implementation of the “Hundred Talent Programme”, aimed at returning junior scientists from overseas. I must say this programme and others were effective channels to attract excellent junior scientists. They have played an important role in the development of CAS and have also been a key force in CAS-MPG cooperation.

The first MPG/CAS partner groups – one of the flagships of our cooperation – were set up during 1999. Almost 35 such groups have been set up to date. They enable Chinese Max Planck grant holders to continue conducting research in China for five years after their stay in Germany as part of a joint project with the German institute. These groups have enhanced MPG-CAS cooperation through important projects and have enabled sustainable networks to be established. Leadership of a partner group also represents a career stepping-stone for many Chinese junior scientists, and quite a few are now CAS directors.

GRUSS: I completely agree with Mr Bai about the importance of promoting junior scientists. This issue has always been one of our key priorities at the Max Planck Society. Also, please allow me to add another aspect regarding the MPG/CAS Partner Groups: we introduced this model with CAS, and it proved so successful that it has become an essential instrument of general internationalization. This is a perfect example to highlight how collaboration with CAS leads to great new impulses.

Mr Bai, earlier on you mentioned differences in the systems. Where is this evident in relation to your organisations?

BAI: MPG focuses on basic research, which is part of its mission. It is also constantly generating new future-oriented topics and has great flexibility in terms of implementation. That is one of its greatest strengths. CAS is set up differently. It effectively combines under one umbrella the three great pillars on which non-university research in Germany is

based. This means that CAS also incorporates applied research, similar to that conducted at the Fraunhofer Gesellschaft, and Mega-science Facilities and research programmes, like those of the Helmholtz Association. In addition, we are also a national think-tank on scientific and development issues and a higher education centre including two universities. One must say that CAS is an integrated, comprehensive institution. But basic research is always one of the most important areas at CAS. In order to better fulfill its mission, I have further improved the management system and areas of responsibility.

GRUSS: From the Max Planck Society's point of view, CAS has established a very solid concept for the promotion of basic research. There are strong research groups at CAS institutes with which our researchers collaborate on equal footing. This is also one of the reasons why we have been organising highly successful 'future conferences' with CAS for several years now – conferences on scientific topics that are still emerging. The Exploratory Round Table Conferences (ERTC) create a platform for a small circle of internationally leading experts and enable scientists from the Max Planck Society and CAS to discuss and become acquainted with new areas of research and identify their future potential. Uli Schwarz paved the way for this kind of dialogue in 2001 with the foundation of the internationally-oriented and interdisciplinary Shanghai Institute for Advanced Studies (SIAS). The new concept for ERTC was successfully developed under the leadership of Professor Wegner and Professor Shen Wenqing. I am really looking forward to the next round table as part of the anniversary in Shanghai on the topic of personalised medicine, which presents major challenges for science in many fields.

This points to the future ...

BAI: That's right, and as Professor Gruss says, the ERTCs represent an outstanding means of jointly evaluating specific, new research topics in order to explore their potential. The fact that we also work together in areas that are tricky to cooperate on is further evidence of our special relationship and trust. But it is more than that, as collaboration between MPG and CAS today extends beyond the boundaries of exchanging scientists and cooperating on a project basis. It is a strategic partnership of equals. We are seeking to build upon this foundation in order to jointly make strategic decisions in future. Ten years ago we observed that – in various circumstances and at different times – we had entered the age of the knowledge society and that the challenges facing us are therefore also the same. China is focusing intensively on the internationalisation of science. CAS is taking the lead and wishes to become an open stage for scientists to do global science.



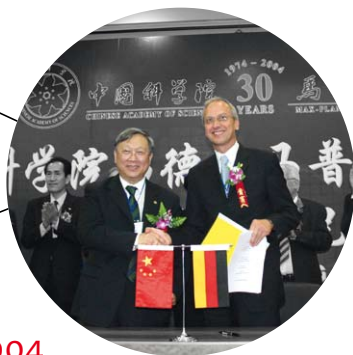
2005

Founding Director Professor Andreas Dress unveils the plaque bearing the name of the new CAS-MPG Partner Institute for Computational Biology (PICB) during the inauguration ceremony. Leading scientists and high-ranking politicians come together to celebrate this further step of cooperation.



2010

The SIAS in Shanghai (photo) becomes the venue for the Exploratory Round Table Conferences (ERTC), at which MPG and CAS scientists join with internationally leading experts to discuss new research topics that have yet to become established. The fifth of these Conferences is taking place in 2014 as part of the 40th anniversary and is dedicated to the topic of personalised medicine.



2004

At the 30th anniversary, Presidents Professor Peter Gruss (r.) and Professor Lu Yongxiang agree to intensify their cooperation: They resolve to set up a joint research facility.



2006

The Max Planck Institutes have a great interest in recruiting Chinese doctoral students. Currently, more than 300 Chinese students carry out research at the Institutes per year. On top of this, up to 30 doctoral students are selected through a special MPG-CAS program, which is being financed from the Chinese side.

GRUSS: I believe that a strategic partnership of equals constitutes the basis for addressing this question. As part of the new MPG/CAS programme on joint career development (“Jun-Ma”), we can support the objective of bringing excellent junior scientists to China and integrating them into the Chinese research system. It is obvious that a country which invests heavily in research and development will play an increasingly important role in the international research and innovation system. Science historians point out that currently – in the light of globalisation – a general transformation is taking place. As global mobility continues to increase, no national science system will predominate in the future as, for example, the German one did from the end of the 19th century to the early 20th century, or as the US system has done over the past fifty years. Instead, regional excellence centres all over the world will set the tone and attract the best and brightest academic minds. The countries’ key players will therefore play a decisive role. The fact that we found a partner in China at such an early stage is a great achievement of both our organisations. And this successful partnership was only possible thanks to the necessary trust between the scientists of our two countries. ◀

The questions were asked by Barbara Spielmann, Jens Eschert, Wang Dongyao



2012

MPG President Professor Peter Gruss, Secretary General Dr. Ludwig Kronthaler, and CAS President Professor Bai Chunli agree on a new initiative to promote the careers of young researchers. The JUNMA Programme provides outstanding postdocs at MPIs with the opportunity to conduct research in China at attractive conditions. The scheme is aimed at strengthening science in the country on the whole.

Prof. Bai Chunli, a well-known chemist and leading scientist in nanoscience, received his Ph.D. degree from the CAS Institute of Chemistry in 1985. From 1985 to 1987, he worked with the US California Institute of Technology in the field of physical chemistry as a post-doctoral associate and visiting scholar. From 1991 to 1992, he worked as a visiting professor at Tohoku University in Japan. Prof. Bai was appointed as the President of CAS in 2011. In the following year, he was elected as the President of the Academy of Sciences for the Developing World (TWAS).

Prof. Peter Gruss earned his Ph.D. in biology from the University of Heidelberg in 1977. The following year, he joined the Laboratory of Molecular Virology of the NIH in Bethesda Maryland (USA). In 1982, he was appointed to Professor at the University of Heidelberg. He was named as Director at the Max Planck Institute for Biophysical Chemistry in Göttingen in 1986. Since 2002, Gruss has been President of the MPG. His term of office ends in June 2014. During the course of his career, he received numerous scientific awards, including the Leibniz Prize.