ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

ORIGINS AND EVOLUTION
OF THE COLLABORATION BETWEEN CERN
AND THE PEOPLE'S REPUBLIC OF CHINA
1971 - 1980

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ABSTRACT

The report describes in some detail the origins and evolution up to the present day of the collaboration between the European Organization for Nuclear Research (CERN) and the Institute of High Energy Physics of the Academia Sinica in Beijing, People's Republic of China. The text is illustrated by a number of photographs, while some of the relevant documents and letters are reproduced as Annexes.
PREFACE

Article II.3.(c) of the CERN Convention states in part that one of the purposes of the Organization is:

“The organization and sponsoring of international cooperation in nuclear research ... this cooperation may include in particular ... the promotion of contacts between, and the interchange of, scientists, the dissemination of information, and the provision of advanced training for research workers.”

After more than twenty-five years of existence, it is well known that CERN has been extremely successful in promoting such international collaboration not only within Europe but also on a world wide scale, especially with the major centres of elementary particle physics research in the USA and the USSR as well as those in India and in Japan. A relative newcomer to this field of research is the People’s Republic of China. It is the purpose of this report to describe the origins and evolution of the collaboration between CERN and China, and in particular with the Institute of High Energy Physics of the Academia Sinica in Beijing, as seen from the point of view of one who has been actively involved since its inception.

The careful reader will note a certain inconsistency in the spelling of Chinese names, although efforts have been made to reduce this to a minimum. In general the spelling of names and of places in quotations from letters or documents have been left unchanged, as have any grammatical errors or spelling mistakes. In the body of the text the modern transliteration of Chinese names and places has been used so that, for example, Peking is written as Beijing.
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INTRODUCTION

1. CERN is a European Laboratory for particle physics research, financed by twelve countries of Western Europe. Nevertheless, it is widely recognized as a world Laboratory in terms of its scientific stature and its openness to collaboration with scientists from throughout the world. Scientists from very many countries work at CERN, among them physicists and engineers from the People's Republic of China, whose Government decided in 1975 to enter the field of elementary particle physics research by establishing an Institute of High Energy Physics of the Academia Sinica. The active and successful collaboration between CERN and China, which by the late 1970's essentially became routine, took many years of discussion and negotiation to establish. It is the purpose of this report to give the history of the discussions which took place from 1971 onwards, when the first official contacts were established between CERN and scientists in the People's Republic of China.

2. During the same period of time as covered by this report, the Chinese authorities established similar contacts with the major high-energy physics laboratories in the United States as well as with laboratories such as DESY, Hamburg, and KEK near Tokyo. Such contacts are mentioned in passing and it will be noted that many of the delegations which came to CERN in the years from 1973 onwards did so either on their way to or from the United States or DESY, Hamburg. In the particular case of the United States the collaboration was eventually placed on a formal level via the Department of Energy, and a US-PRC Joint Committee on High-Energy Physics was set up, which held its first meeting in Beijing in June 1979. The collaboration was extended in June 1980 by the signature at Fermilab of an agreement between the Department of Energy in the USA and the Academia Sinica of the People's Republic of China. (See CERN Courier for September 1980, No. 6, pages 255–256.)

3. Before 1971 there were some personal contacts between scientists from Europe and the USA and individual scientists in China. One of the very first of these, after the Second World War and the emergence of the People's Republic of China, was between two of three people who will occupy a central position in the story which follows: Professor Chang Wen-yü and Professor Luke C.L. Yuan (See Plate 1.) Chang Wen-yü graduated brilliantly from Yenching University in Beijing in the early 1930's and passed the annual "Boxer Indemnity Fund Scholarship" examination sponsored by the Chinese Government at the time for sending students to study in England. He chose to work at the Cavendish Laboratory and spent the years 1934–1938 working under Lord Rutherford. He returned to China for some years but in 1943 went to the United States and held positions at Princeton and Purdue Universities. He returned again to China in 1956 and worked in the Institute of Atomic Energy of the Academia Sinica in Beijing. He became Director of the Institute of High Energy Physics of the Academia Sinica in Beijing in 1975.

4. During the time of the contacts with China, Luke Yuan was based at Brookhaven Laboratory in the United States. He had been a fellow student and close friend of Chang Wen-yü in the Physics Department at Yenching University. He went to the USA in 1936 on an exchange fellowship with the University of California at Berkeley for one year, and subsequently spent the years 1937–42 at the California Institute of Technology working under Professor Robert A. Millikan. During the Second World War he worked on war-related projects at the RCA Laboratories in Princeton, and after the war held a position at Princeton University until 1949 when he joined the staff at Brookhaven National Laboratory. While he was at Princeton, Chang Wen-yü was also there, both of them carrying out research in cosmic rays.

5. The third person whose name will occur frequently in the following pages is that of Tsien San-tsiau, a leading figure in the Academia Sinica for many years (see plate 11). He is also a physicist who spent some time in Paris in the late 1930's in the laboratory of F. Joliot-Curie. He has played a major and influential role in promoting closer contacts between Chinese scientists and those in other countries over the past years, although in the case of CERN the point of direct contact has usually been Chang Wen-yü. Nevertheless Tsien San-tsiau has always been present at the meetings of successive Directors-General.
Plate 1  Chang Wen-yü (centre) with Luke C.L. Yuan (left) talking to Kjell Johansen at CERN, June 1973. (Photo CERN)
of CERN with senior members of the Government in Beijing in 1975, 1977, and 1979 (see, for example, plates 4 and 16).

6. The first contact took place at the 1958 International Conference on High Energy Physics, held at CERN in July 1958. Chang Wen-yü and his wife (Wang Cheng-shu) came to Geneva to attend the Conference. They were the first scientists from mainland China to attend such an international meeting since the Communist Government came to power in 1949. Luke Yuan was also there, as he was spending some time as a Guggenheim Fellow at Saclay and as a Ford Foundation Visiting Scientist at CERN. In a letter dated November 1980, written to the author, Luke Yuan says:

"... it was a happy reunion for the three of us, and I was very happy to hear about what had been happening in China then and the news about some of our mutual friends there. I believe that this occasion probably marked the first direct contact between Western scientists and scientists from the new China."

7. It was not until 1962 that an attempt was made to involve China in the work of CERN. Professor C.N. (Frank) Yang together with Professor V.F. Weisskopf, then Director-General of CERN, invited Hsien Ting-chang of Beijing, who was at that time working at the Niels Bohr Institute in Copenhagen, to attend the 1962 International Conference on High Energy Physics held that year at CERN. Unfortunately he was unable to attend. (Hsien Ting-chang later became a member of the Institute of High Energy Physics in Beijing.)

8. A few years later, in 1965, Professor L. Van Hove (then Leader of the Theoretical Studies Division at CERN) visited Japan and during his stay he was approached by Professor S. Sakata* of Nagoya University, who encouraged CERN to establish contacts with Chinese physicists. At about the same time, a similar suggestion was made by Yang. The matter was also discussed with Weisskopf, who was still Director-General of CERN. As a result, one of the first actions of Professor R.P. Gregory when he succeeded Weisskopf as Director-General in January 1966, was to send a letter to Professors Chou Kuang-chao and Tsien San-shing, both of the Institute of Nuclear Research of the Academia Sinica. This letter, dated 17 January 1966, after explaining CERN and its aims, asked for "... help and support in promoting scientific contacts between China and CERN". (The full text is reproduced in Annex 1.) No reply was received to this letter.

9. In the middle of 1966, a research group in Beijing working on particle physics theory organized a Summer Physics Colloquium, which was attended from the West by Professor A. Salam and possibly others. Perhaps as a consequence of this meeting three Chinese high-energy physicists (Chang Wen-yu, Chou Kuang-chao and Hu Ning) were invited to the Berkeley High Energy Physics Conference in 1966, but no response was received. It became known later that the Academy of Sciences ceased to operate during the years 1966–1968 and it is not surprising therefore that no replies were received to Gregory's letter or to the invitations from Berkeley. In fact research in theoretical particle physics and fundamental research in other branches of natural sciences were interrupted for several years, and it was not until 1971 that eminent Chinese scientists working abroad, such as Yang, started to visit China to give lectures, followed from 1972 onwards by Professor T.D. Lee**.

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* At a Symposium held in Beijing in 1964, Sakata met Chairman Mao Zedong (Mao Tse-tung) who valued the important scientific contribution he made using the method of dialectics in his research. Sakata's article "Dialogues concerning a new view of elementary particles" was translated into Chinese and published in the periodical "Red Flag" in 1965. It encouraged some of the Chinese physicists to develop the "straton model" of the structure of hadrons, the main results of which were presented at the 1966 Summer Colloquium mentioned in paragraph 9.

** Lee and Yang were jointly awarded the Nobel Prize for Physics in 1957.
PRELIMINARY CONTACTS 1971–1972

10. No further steps were taken by CERN for five years, until 1971, when Weisskopf (who had returned to MIT in the United States) raised the matter again in a letter (see Annex II) dated 22 April 1971 to Professor W. Jentschke, who had succeeded Gregory as Director-General in January 1971. In this letter Weisskopf said:

“I am quite sure that all of you must have thought these days about establishing relations with the Chinese high energy physicists. Obviously, I am very much in favor of such a step, and I should like to urge you to invite some people to the Amsterdam conference and to the CERN accelerator conference.”

and he ended:

“I hope such actions will be successful. After all, it is our duty to build bridges as soon as it seems hopeful that they will be used. We are going to invite some Chinese physicists to some conferences in America.”

11. Jentschke consulted Van Hove (who became Director of the Theoretical Physics Department as from July 1971) and the latter reacted favourably to the idea of making a new approach. A revised version of the 1966 Gregory letter was prepared and a paragraph was added inviting Chinese scientists to attend the VIIIth International Conference on High-Energy Accelerators at CERN in September 1971. The letter was sent on 25 June 1971 to the President of the Academia Sinica, but no reply was received. Somewhat later (see paragraph 25) it became apparent that the IUPAP Sponsorship of the Accelerator Conference was a stumbling block for the Chinese, as at that time China was still represented in IUPAP by Taiwan.

12. The lack of response from China did not stop discussions from continuing on ways and means of establishing contact. Towards the end of 1971 it appears that Weisskopf wrote to Jentschke suggesting less official ways of contact with Chinese physicists, while Yang (who had visited China in 1971) gave Van Hove information about the Institute of Atomic Energy of the Academia Sinica and the news that Chang Wen-yü was Deputy Director.

13. In January 1972, Van Hove therefore proposed that a letter, similar to but shorter than those of 1966 and 1971 should be sent personally to Chang Wen-yü inviting him and his collaborators to visit CERN. Such a letter was sent by Jentschke on 7 February 1972 (see Annex III).

14. The next event was a further visit to China by Yang, who wrote to Van Hove from Xian in July 1972 saying that he had spent a few days in Beijing and requesting that the “CERN Courier” be sent to Hu Ning at the Physics Department of the University of Beijing and to Chang Wen-yü at the Institute of Atomic Energy of the Academia Sinica. This was immediately arranged, and the two Institutes were placed also on the Library preprint mailing list. From information gathered much later by both Dr. J.B. Adams* and Van Hove when they visited China, it appears that the CERN Courier considerably helped the Chinese scientists to become aware of developments in high-energy physics in the rest of the world. Later in the year Yang visited CERN, and gave a talk about his trip to China which attracted a large audience and much interest amongst the CERN personnel.

15. A change in policy of the Chinese Government in its relations with other countries took place around 1971. In particular a new relationship was established with the United States following the visits of Henry Kissinger to Beijing in 1971 and of Richard Nixon in February 1972. The agreement then reached between the two Governments provided, amongst other things, for the establishment of scientific contacts between the two countries. This took practical form in the field of high-energy physics in that Chang Wen-yü was

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* Adams was Director-General of CERN Laboratory II 1971–1975 (when W. Jentschke was Director-General of Laboratory I) and he and Van Hove were Directors-General of the combined CERN Laboratory 1976–1980.
included as a member of a scientific delegation which was sent to Europe and to the United States in October 1972. “The Times” of London reported: “Seven leading scientists left Peking today (6 October) to study Western nuclear developments and American ways to combat pollution. The scientists will visit Britain, Sweden, Canada and the United States. The party includes one of China’s foremost high energy and nuclear physicists, Professor Chang Wen-yü.” It was later learnt that Chang Wen-yü had hoped to be able to visit CERN during the tour of the delegation in Europe, but that their tight schedule did not allow this.

16. A month later another delegation, this time composed of eleven scientists and engineers, visited Switzerland as guests of the Swiss Département Politique Fédéral. The main purpose of their trip was to visit the “NUCLEX” Exhibition of Nuclear Equipment and Apparatus in Basle. However, via the Swiss authorities and the Commercial Attaché of the Chinese Embassy in Berne, they expressed the wish to visit CERN. The Delegation came to CERN on 6 November 1972, accompanied by officials from the Swiss and Chinese authorities in Berne and by Luke Yuan, who was visiting Europe at that time.

17. The members of the Chinese delegation to the Basle Exhibition were all scientists or engineers. None of them were specialists in high-energy nuclear physics and their visit to CERN was simply one of general interest in the nuclear physics field. In addition, the leader of the delegation, Professor Chang Wei (of the Tsing Hua University in Beijing) was unable to participate in the visit because of another engagement (see paragraph 20 below).

18. Four days later, on 10 November 1972, the Chinese Ambassador to Switzerland gave a reception at the Embassy in Berne to thank all those who had been associated with the visit of the Delegation to Basle, to CERN, and to other places in Switzerland. Jentschke and Adams were invited to this reception but they were unable to attend. They were represented by Luke Yuan, who was able to have long talks with both the Chinese Ambassador and the leader of the Delegation, Chang Wei. He summarized these talks in a note, dated 13 November 1972, to the CERN Director of Administration, G.H. Hampton.

19. Since this meeting in Berne was the first time that there had been bilateral discussions on the possibility of collaboration between CERN and scientists of the People’s Republic of China, Luke Yuan’s note is reproduced in full in the next paragraph.

20. “The Chinese Ambassador, Mr. Tchen, together with Professor W. Chang who is the head of the Chinese Scientific Delegation and also the Vice-President of Tsing Hua University in Peking both expressed their appreciation and thanks for the very kind hospitality shown by CERN to the Chinese Delegation on their visit here. Professor Chang expressed his regret that he could not come to CERN because at that time he had just been elected as member of the Executive Committee of UNESCO in Paris, so he had to be in Paris to attend the UNESCO meeting.

“Both of them were extremely cordial and I had a long talk with them on a number of topics. I again extended CERN’s welcome to any future exchange of visits of scientists from China who may wish to come to CERN to visit or to stay for a period of time to do some work. Both Ambassador Tchen and Professor Chang expressed their appreciation of this offer from CERN and they will forward CERN’s kind invitation to the Chinese Government. Professor Chang informed me that he will be returning to China soon and he will transmit this message personally.

“The Chinese Ambassador seemed to be very happy that I came from Geneva just to attend his reception on behalf of CERN. He asked me to forward his thanks again to the Directors-General of CERN for all their kindness and goodwill toward China.

(Signed) Luke C.L. Yuan”

(Note that the Professor W. Chang mentioned by Luke Yuan is not Chang Wen-yü but Chang Wei.)

21. Luke Yuan followed up this report by a note to Hampton, dated 29 November 1972, in which he mentions that he had been in contact with “Professor W.Y. Chang of the Chinese Academy”, presumably in
this case Chang Wen-yü, and that the latter had informed him “that either one of the three following persons would be happy to discuss matters concerning exchange of visits with CERN should CERN wish to contact them”. He gave his own name and those of the President and Vice-President of the Academia Sinica at that time.

22. As a result of these encouraging contacts made by Luke Yuan, Hampton wrote to Jentschke on 1 December 1972 saying:

“I think we should decide whether to let the matter lie or whether you would like to follow up the contacts that Professor Yuan has made, in which case I think we ought to write again to some of the people that he suggests whilst the question is still fresh in their minds.”

On 6 December 1972 Van Hove advised:

“The significance for CERN of establishing genuine scientific contacts with Chinese physicists would be very high. The possible cost, on the other hand, should not amount to more than a small fraction of the Non-Member State Visiting Scientists budget.”

23. Jentschke followed this advice, and on 15 December 1972 he sent a revised version of his previous letter, mentioned in paragraph 13 above, to Chang Wen-yü, with copies to the President of the Academia Sinica and to the Chinese Ambassador in Berne (see Annex IV for the complete text of the letter; note however the continuing confusion between Chang Wei and Chang Wen-yü).

1973: THE FIRST DIRECT CONTACTS

24. This time there was an almost immediate answer from Chang Wen-yü to Jentschke’s letter, although he was not able to give a definite reply to the invitation to visit CERN. In his letter (for the full text see Annex V) he said: “We have been considering your suggestion and shall exchange views with you about this matter again.”

25. As mentioned in paragraph 15, the delegation led by Chang Wen-yü to Europe and the USA visited Sweden in the autumn of 1972. In January 1973 the Director of the Bureau of Foreign Affairs of the Academia Sinica wrote to Dr. G. Tibell of Uppsala University thanking him for the hospitality extended to the delegation when they visited Uppsala. He also referred to an invitation which had been received by the Academia Sinica to send participants to the Uppsala Conference on Nuclear Physics to be held in June 1973. However, he said “We are sorry that owing to the fact that the Conference is sponsored by the IUPAP with the elements of the Chiang Kai-Shek as its members, it is impossible for the Chinese physicists to consider the possibility of participating in the Conference on Physics to be held this year in Uppsala, Sweden…”

26. Tibell brought this letter to the attention of the author, at that time responsible for the Scientific Conference Secretariat of CERN and for the Fellows and Visitors Service (now Fellows and Associates Service) in Personnel Division, who forwarded a copy to Jentschke with a covering note saying: “In view of the friendly tone of the letter perhaps it would be worthwhile for you to write again to Peking in the same sense as you did in June 1971. I have also suggested to Gregory [who had then returned to a senior position in France] that he invites one or two Chinese to the Aix Conference[4]; since it is not IUPAP sponsored they might feel able to accept.” As a result of this note the author was sent a copy of all the correspondence mentioned in paragraphs 16-21 above and henceforth became responsible to successive Directors-General (at first informally) for the coordination of the relations between CERN and the People’s Republic of China.

27. The next direct contact between CERN and the Chinese scientists was again initiated by Weisskopf, who visited China for a month in May-June 1973. Before going he wrote to Jentschke (on 13 April 1973) saying:

"I am going to China on a longer, rather official trip as a member of a "delegation" representing the National Academy of Sciences and the Council of Learned Societies. It is a strange combination of scientists, scholars and Big Shots. I will be there from May 15th until the middle of June. I believe that I will have some opportunities to talk to rather influential people in the Chinese scientific establishment. This is why I would like to know whether I can invite Chinese physicists to come to CERN. It would be very useful to me if you could send me copies of any correspondence you have had with the Chinese and their answers. At the same time, I would like to know whether I can tell them that the Chinese physicists would be welcome at CERN as the guests of CERN with all expenses paid, except the trip, for a period of say up to six months or any other period which you may find more suitable."

28. Jentschke replied promptly, sending him all the recent correspondence with Chang Wen-yü. He followed this up with a telephone conversation with Weisskopf and confirmed what he had said in a letter dated 30 April 1973:

"I would like to confirm that we are very interested in starting-up a collaboration with Chinese elementary particle physicists, within the frame of the well-established rules and procedures which have been set up at CERN for visiting scientists from non-member states. In this respect, CERN would be prepared to pay for the stay of up to two elementary particle physicists for a period of not longer than one year each. Very short term visits would be welcome provided China were to pay for them."

and he added:

"I just had a telephone conversation with Luke Yuan, during which he mentioned that he had received a letter from Chang, Chang gave me his best regards and announced that he would write to me if he succeeded in his plans to visit CERN." (In this case it was Chang Wen-yü.)

29. Events now began to move rather rapidly, and on 10 May a telephone call and then a telex were received from Mr. Lu Ching-ting of the Commercial Office of the Chinese Embassy in Berne with the news from Beijing that Chang Wen-yü was now in a position to accept the invitation to visit CERN with some of his colleagues for ten days in the second half of June.

30. Lu Ching-ting accompanied by Mr. Chang Chun-shan (Economic Attaché in Berne) came to CERN on 22 May to discuss the detailed arrangements for the visit of Chang Wen-yü and his colleagues. The present author participated in this meeting, as did Luke Yuan who was at CERN at that time. Responsibility for the organization of the visit was entrusted to Lock with the advice of Luke Yuan and assisted by W.S. Newman, responsible for visits in the CERN Public Information Office, who also helped in the preliminary discussions held in German with the Berne diplomatic staff.

31. At approximately the same time Weisskopf was in China and wrote to Jentschke from the Beijing Hotel, on 19 May 1973, saying in part:

"This is just a short note from this wonderland. Just when I arrived in Peking I talked to Chang Wen-yü. He is the most important high energy physicist here.... He just left for a month or 6 weeks to USA.... On his return trip he could stop at CERN for a few days. It would be most desirable if you could write him a letter of invitation to CERN for his visit...."

Of course, at this time Weisskopf did not know that this possibility was already under discussion via the Chinese Embassy in Berne, and his letter was only received in CERN on 29 May 1973. However, to make sure there were no misunderstandings, Lock wrote to W.A. Wallenmeyer of the US Department of Energy, formerly the Atomic Energy Commission (who were looking after the tour of Laboratories in the
Plate 2  The first Chinese delegation to CERN, June 1973. In the front row, left to right starting from the second on the left: Wang Chu-hsiang, Chang Wen-yü, Luke Yuan and Tzu Hung-yuan (see Annex VI). In the centre E. Fischer (wth beard) behind Chang Chuan-shan, and to the right W.S. Newman and then Lu Ching-ting (with glasses). (Photo CERN)

Plate 3  June 1973: Members of the delegation being shown the ISR by L. Resegotti, with Wang Chuan-yung on the left; behind Resegotti is V.F. Weisskopf, and Tzu Hung-yuan is on the extreme right. (Photo CERN)
USA by the Chinese delegation), to inform him that arrangements were in hand for the visit of Chang Wen-yü and his colleagues to CERN.

32. The visit of the delegation took place from 25 June to 4 July 1973. They were met at Geneva airport on their arrival from the United States by Luke Yuan and Lock on behalf of the Director-General. Weisskopf had arranged to travel in the same plane as Chang Wen-yü and his colleagues so that they could talk to each other during the journey. The composition of this first delegation of Chinese high-energy physicists to CERN is given in full in Annex VI.

33. The delegation spent five days at CERN seeing all the major facilities. (See plates 1-3.) As relaxation on Sunday 1 July, a beautiful summer day, they went together with a number of CERN colleagues as well as Professors S.C.C. Ting, Luke Yuan and Weisskopf and Mrs. Weisskopf on a lake steamer to the Château de Chillon. The Chinese Ambassador to Berne, who was on the famous Long March in 1935–1936, also came on this excursion, as did the Chinese Consul-General in Geneva, and their wives.

34. At the end of the visit, on 4 July 1973, a discussion was held between senior representatives from CERN and from the delegation, with Weisskopf and Luke Yuan also in attendance, to consider the possible forms in which collaboration could take place in the future. However, Chang Wen-yü made it clear that his mandate was to report to Prime Minister Zhou Enlai (Chou En-lai) on the desirability or otherwise of China entering the field of high-energy physics and that any decision, positive or negative, might take some time. He added that, since the Cultural Revolution, China had not sent people abroad to gain experience and did not yet have a policy of doing so—it would have to be established. The summary of the main topics discussed at this meeting, together with the names of the participants, is given in full in Annex VII.

35. The Chinese authorities showed their appreciation of the hospitality extended to the delegation by holding a reception at the Permanent Mission of the People's Republic of China at Petit-Lancy in Geneva, on Monday 2 July. This was the first of many receptions and dinners held there for CERN staff in subsequent years, events which are much appreciated because of the pleasant hospitality and the excellence of the food.

36. In the autumn of 1973 Luke Yuan went again to China and, in addition to meeting Chang Wen-yü and his colleagues, he was introduced to Prime Minister Zhou Enlai and discussed with him the desirability of a decision by the Chinese Government to embark on a major research programme in high-energy physics.

37. Luke Yuan visited CERN towards the end of 1973 and reported in detail to Jentschke. As a result the latter wrote a further letter to Chang Wen-yü, dated 17 December 1973, saying:

"I feel that we should maintain the direct contacts which we have already established between our respective Institutes. In particular, I would like to propose to you that three physicists from CERN (perhaps two experimental and one theoretical) come to visit your Institute in Peking ... for a few weeks."

38. Another outcome of Luke Yuan's visit to China was that he asked if CERN could send a few minor items of equipment to China in view of a possible future collaboration. He discussed this with Lock who arranged for a Beijing "Team account" to be opened in what was then the Nuclear Physics Division, for an initial maximum expenditure of SFr. 10,000. Jentschke agreed to this step early in 1974 and somewhat later that year a prototype of a $10 \times 10$ cm$^2$ multiwire proportional chamber, some isobutane and freon gas cylinders, and some pressure-reduction valves were sent to the Institute of Atomic Energy in Beijing, of which Chang Wen-yü was then Deputy Director. This material arrived at the Institute in July 1974. The equipment was provided by the group of Georges Charpak at CERN.
39. Contacts on a less formal level were maintained by the officials of the Commercial Section of the Chinese Embassy in Berne with Lock and Newman who together with their wives, and immediate colleagues Miss Régine Charreyron, Miss Dilyss Grass (now Mrs. Dilyss Naylor), and Mrs. Elizabeth Kitson-Pasche (now Mrs. Elizabeth Spinks), were invited to dinner at the Consulate in Berne on 1 March 1974. Lock reported later to Jentschke “The dinner was excellent!” This was the first of several dinners that took place at Berne before the point of contact shifted in summer 1975 to the Chinese Mission in Geneva.

40. On the more official level, little happened in 1974, and it is now clear that internal discussions in China were taking a considerable time*. It was only in August 1974 that Chang Wen-yu replied to Jentschke’s letter of December 1973. He said:

“...I have been working away from Peking for so long that I had to delay to reply to your letter for which I regret very much. In regard to the possible collaboration and the mutual visit between CERN and China as you have proposed, we are now giving serious consideration ...”

RENEWED CONTACTS 1975–1976:
FIRST VISIT TO BEIJING BY CERN SCIENTISTS;
CHINESE SCIENTISTS AT CERN

41. The next move was made by the Chinese authorities again via the Commercial Section of the Embassy in Berne. On 26 March 1975, Chang Chun-shan, Commercial Attaché, came to CERN together with a colleague and met Charpak, Lock, Newman, and Luke Yuan who was again at CERN. He brought an invitation from Chang Wen-yu for Adams, Charpak**, Jentschke, Steinberger**, and Weisskopf to visit China in May 1975 for three weeks, with all expenses paid. It was explained to Chang Chun-shan that a visit as early as May was out of the question and it was suggested that an invitation should also be extended to Van Hove, who together with Adams had recently been appointed Director-General of CERN for the period 1976–1980.

42. The invitations to Steinberger and Weisskopf were transmitted to them in the United States (where the former was on a visit), while the invitations to the other people were discussed with them by Adams and Jentschke. Some two weeks later Lock was able to tell the Chinese authorities informally that Jentschke and Charpak were happy to accept the invitation for September, that Adams could not go, and that no answers had been received from Steinberger and Weisskopf.

43. Following these informal approaches a formal letter of invitation dated 25 April 1975 was sent by Chang Wen-yu to the five people mentioned above plus Van Hove, suggesting that the visit took place in August or September of that year. This letter is reproduced in full in Annex VIII. During the summer the details of the visit were established via the Chinese Embassy in Berne and by direct correspondence. The group finally consisted of Charpak, Jentschke, Van Hove and their wives from CERN, and Weisskopf and his wife from the USA.

44. The group were in China for approximately two weeks, during September 1975, visiting universities, institutes, and factories in and around Beijing and Shanghai. They learnt that a new institute had been set

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* In a foreword to the Proceedings of the 1980 Guangzhou (Canton) Conference on Theoretical Particle Physics, Tien San-tsang says: “The obstacles to the progress of science in China were finally removed in 1976.”

** Georges Charpak and Jack Steinberger are senior physicists in the Experimental Physics Division of CERN.
up in Beijing for research in elementary particle physics, with the title “Institute of High Energy Physics” of the Academia Sinica, and that Chang Wen-yü had been appointed Director. The members of the group lectured at Beijing, and Van Hove also gave a lecture at Shanghai. In Beijing they saw several copies which had been made of the prototype multiwire proportional chamber which had been sent the previous year (see paragraph 38). A short article describing their visit, which appeared in the October 1975 issue of the CERN Courier, is attached as Annex IX.

45. On 13 September in Beijing, there were two important discussions concerning the future development of the relationship between the scientific communities. In the morning, the interest of the Chinese physicists in continuing the contact was expressed by Tsien San-siang, Director of the Institute of Atomic Energy, during a tour of the Institute. This was reiterated by Professor Wu Yiu-hsun, Vice-President of the Academia Sinica, at a dinner offered to the CERN visitors.

A highlight of the tour was a meeting with Wu Lein-fu, Vice-Chairman of the Standing Committee of the National Peoples Congress. (See Plate 4.) The Vice-Chairman said that China wished to see the contacts and exchanges with high-energy physicists, particularly of CERN, extended, and stressed the readiness of China to learn from scientific and technical experience elsewhere.

In concluding discussions with Chang Wen-yü, Tsu Hung-yuan, and Tu Tung-sheng of the Institute of High Energy Physics, future exchanges of information and of people were considered.

46. On his return, Jentschke wrote a letter of thanks (dated 2 October 1975) to Chang Wen-yü:

“...We are eagerly looking forward to continuing and intensifying the contacts between your high energy physicists and CERN. We are open to any suggestions in this respect; in particular, we would be very glad to welcome Chinese visitors at CERN, be it in the domains of theory, experimental physics, instrumentation or accelerators....”

47. The next contacts were with the officials of both the Chinese Permanent Mission in Geneva and the Chinese Embassy in Berne, who visited CERN on 13 November 1975. (See Plate 5.) The group was headed by the Chinese Ambassador in Geneva, An Chih-yuan, with whom CERN was to have frequent contacts during the following four years until he returned to China early in 1980.

48. Further to informal contacts between CERN and the Chinese officials mentioned in the previous paragraph, the Directors-General of CERN, Adams and Van Hove, wrote to Chang Wen-yü, on 28 April 1976, inviting a group of eight Chinese scientists to visit CERN for one or two months during the summer. They arrived in May 1976, led by Tu Tung-sheng (a theoretical physicist and a member of the Revolutionary Committee of the Institute of High Energy Physics at Beijing). Other members of the delegation were Tang Shao-wai, Wang Shu-hung, Yen Tai-hsuan, and Pan Hui-biao (from the Institute of High Energy Physics), Chang Chih-chieh (from the Institute for Automatic Control at Sheng-Yang), Wang Jen-chuan (from the Bureau of Foreign Affairs of Academia Sinica), and Cheng Chi (from the Institute for Machine Research). (See Plates 6 and 7.) They were specialists on various aspects of accelerator technology (RF, magnet design, computer control systems, etc.) and experimental and theoretical high-energy physics. Detailed arrangements for their visit were coordinated by C.S. Taylor (of PS Division) together with Lock, and by Luke Yuan who spent some time at CERN specifically for this purpose. Four of the group visited CERN for a month, while the remaining four stayed for a second month. After getting acquainted with CERN they spent their time in the Divisions according to their particular interests. The CERN Courier of June commented: “The visit seems to be a great success. The CERN staff have welcomed the delegation with enthusiasm which has been most warmly received by the Chinese physicists. This is a further step in the strengthening of scientific relations between CERN and the high energy physics community in China.” It is of interest to note that, two years later, the June 1978 issue of the Courier carried the news that Tu Tung-sheng had joined the list of CERN Courier correspondents.
Plate 4 The first CERN delegation photographed in the National Peoples Congress Palace in Beijing in September 1975. From left to right front row: Tsien San-siang, Mrs. Weisskopf, Wu Hung, V.F. Weisskopf, Wu Leis-fu, W. Jentschke, Wu Yiu-han, Mrs. Jentschke and Chang Wen-yu; second row, left to right: Li Chang-fu, Tu Tung-sheng, Zhu Yang-hang, Hu Ning, L. Van Hove, Mrs. Van Hove, G. Charpak, Mrs. Charpak, He Zhe-hui and unknown. (CERN Courier, October 1975)

Plate 5 Wives of Chinese officials from the Permanent Mission in Geneva and the Embassy in Berne together with Mrs. Van Hove (centre, facing camera) at the CERN Nursery School, November 1975. (Photo CERN)
Plate 6 The first group of Chinese scientists to work at CERN, together with officials from the Chinese Mission in Geneva and the Chinese Embassy in Berne, photographed in the Board Room of the Main Building in May 1976. From left to right: Wang Jen-chuan, Cheng Chih, Yen Tai-xuan, Yi Su-chieh (Deputy Permanent Representative, Geneva), Tang Shiao-wen, Chang Chun-shan (Economic Attaché, Berne), Chan Chih-chueh, Tu Tung-sheng, Pan Hui-bao, Wang Shu-hung, Zhen Fu-xui (Permanent Mission, Geneva). (Photo CERN)

Plate 7 J.B. Adams (centre) in the SPS tunnel, May 1976, with, from left to right: Pan Hui-bao, Wang Jen-chuan, Tu Tung-sheng and Wu Sau-lan from MIT. (Photo CERN)
1977: THE SECOND CERN GROUP VISITS CHINA

49. Even before the second group of four visitors had returned to China, Chang Wen-yu wrote to the two Directors-General, expressing his thanks for the hospitality extended to the first four and extending an invitation to Adams to visit Beijing (letter dated 21 June 1976). A further letter, dated 2 March 1977, also invited Steinberger to accompany Adams, while at a later date M.C. Crowley-Milling (then Leader of the SPS Division at CERN) was added to the list. In the event, Steinberger could not go, so only Adams with his wife and Crowley-Milling set out for Beijing in September 1977, two years after the first visit by Charpak, Jentschke, Van Hove, and Weisskopf.

50. The group spent eight days, from 20 to 27 September 1977, in and around Beijing. They gave lectures and participated in discussions on particle physics accelerators at the Institute of High Energy Physics, and visited other Institutes of the Academy as well as local industries such as the Beijing Iron and Steel Plant, the Beijing Electrical Generator Plant, and the Beijing Broadcasting Equipment Factory. (See Plate 8.)

51. On Thursday 22 September 1977, the scientists of the Institute of High Energy Physics informed Adams and Crowley-Milling of their plans for accelerator construction. Adams wrote subsequently in an internal report describing the visit: "The great event of the day was the official announcement of the plans of the Institute for accelerator building. They have patiently listened to all the advice they have received from foreign visitors over the last two years and have chosen proton machines. ... Essentially they are planning a step by step approach to an SPS (Super Proton Synchrotron)." As described at this time, the original ideas were for a 250–750 keV Cockcroft-Walton injector, followed by a 30 (or 50) MeV linac, and then a 5 GeV fast cycling booster leading eventually to a 200 GeV proton synchrotron. As will be described later, these initial plans were subsequently modified to plans for building a 30 GeV proton synchrotron (later still increased to 50 GeV), preceded by a 2 GeV booster and a 70 MeV linac.

52. In the evening, Tsien San-chuang, Deputy Secretary-General of the Academia Sinica, gave a dinner attended by Senior Staff from the Academy and the Institute. As Adams reported:

"The purpose of the dinner was to discuss the plans of the High Energy Physics Institute which were presented in the afternoon. Four main questions were discussed: Protons or Electrons, Energy of the Accelerator Stages, Costs, and Help from CERN. ... [The latter] turned out to be the most important one from their point of view. The day before this dinner there was a meeting of the Academy of Sciences addressed by Chairman Hua at which the official policy for the advancement of science and technology in China was promulgated for the first time. [An extract from this policy is given in Annex X.] Effectively the policy is now to learn from the developed countries and to use their technological achievements to press forward in China. This policy is a complete reversal of the policy of the last ten years. Consequently, the Academy and the High Energy Physics Institute is now free and anxious to collaborate closely with other foreign laboratories in their plans for building up this research in China. China wishes to collaborate closely with Western Europe. Hence the Institute looks at CERN as its principal partner in carrying out their plans. We discussed in a general way how CERN could help and the subject was pursued in more detail at an after-dinner discussion later on during our visit."

53. On the evening of 26 September, Adams, his wife, and Crowley-Milling were received in the People's Palace by Vice-Premier Deng Xiao-ping. (See Plate 9.) Adams reported the meeting as follows:

"Vice-Premier Teng reviewed the early history of science and technology in China and its development after the revolution. He said that during the last ten years due to the actions of the 'Gang of Four' science and technology had fallen behind again in China. The new regime now wanted to push forward again and to catch up with the developed countries by the end of the century. To do this they need the help of Western Europe and for their high energy physics programme they needed the help of CERN."
Plate 8  Tableau which greeted John and Renie Adams and Michael Crowley-Milling during their visit to Beijing (September 1977). It reads "Warm welcome to Uncles and Aunts from the European Organization for Nuclear Research who have come to visit our Kindergarten". (CERN Courier, December 1977)

Plate 9  John Adams being greeted by Vice-Premier Deng Xiao-ping in Beijing, September 1977; Mrs. Renie Adams is on the left. (CERN Courier October 1977)
"The discussion lasted an hour; all the leading members of the Academy were present together with those from the Institute. It was clearly an occasion for Teng to present the new Chinese policy (everyone was taking notes of all that was said). It was also a serious appeal for help from Western Europe in general, and from CERN in particular, for their high energy physics programme."

The text of the Press Release issued by the Chinese News Agency Hsuanhua after this meeting is given in Annex XI.

1978–1979: FIRST SYSTEMATIC EXCHANGES OF SCIENTISTS;
CHINESE DELEGATIONS AT CERN

54. Adams reported on his visit to China to the Committee of Council of CERN at its meeting of 28 October 1977, and received its support for the continuation of discussions on collaboration with the Chinese scientists. As a result Adams then wrote a long letter to Chang Wen-yü, dated 23 November 1977, in which he outlined his ideas on the way in which the collaboration could be set up. In particular he said:

"... the collaboration would take the form of your staff working at CERN and some of our experts visiting your laboratory.

"I understood from our conversations in Peking that the Academy of Sciences is prepared to finance the cost of sending your staff to our laboratory and their expenses whilst they are in Geneva, and the expenses of our experts when they are in Peking.

"Clearly, the length of time that your staff would stay at our laboratory depends on the category of information and help with which they are concerned.

"For the design and construction of accelerators, short visits may be useful, but longer stays, up to one year, will be necessary in order to gain experience. The same applies to the design and construction of experimental equipment. For experimental research experience, however, a relatively long stay, of, say, one or two years would enable your staff to join an experimental group at CERN and participate in an experiment. In the field of theoretical physics, short and longer stays seems equally appropriate..."

He ended this letter (the full text of which is given in Annex XII) by saying:

"Finally, we suggest that we begin this collaboration in a modest way with a few of your staff coming to CERN, and that we learn by experience how to make it work efficiently.

"I hope these ideas on the form our collaboration could take will be acceptable to you and we look forward with pleasure to your reply. May I add that we greatly welcome this collaboration between our laboratories and will do everything we can to make it a success."

55. The response from the Chinese side was very prompt in that two officials from the Chinese Embassy in Berne and one from the Chinese Mission in Geneva came to CERN on 12 January 1978. They met Adams and Lock and asked if CERN was willing to accept the visit of a group of about twelve accelerator specialists for a month in February or March 1978. The purpose of their visit would be to discuss with CERN experts the plans of a project which had been drawn up in China for the construction of a 30 GeV proton synchrotron. Adams replied that he agreed to such a visit but it was not quite what he had proposed to Chang Wen-yü in his letter of 23 November 1977 and that he would like to have a reply in order to decide the way in which the collaboration should be developed in the future.

56. In fact a reply was received at CERN some two weeks later. In a letter dated 20 January 1978 Chang Wen-yü expressed his complete agreement with what had been written by Adams, and specifically he said:

"In the first place, we agree that we shall maintain in CERN a number of five to ten persons in each of the first few years to learn from you for a longer working period (e.g. for half to one year). Most of these persons will be accelerator and detector engineers (designers, builders and operators), probably a few of them will be experimental physicists. Therefore I have in mind that we shall first send over four
accelerator people in March or April this year as a kind of trial, then send more after gathering some experiences.

"Secondly, our Institute is now designing a 30 GeV proton synchrotron with a 200 MeV linear accelerator as its injector. The beam intensity of the 30 GeV accelerator is $1-2 \times 10^{14}$ ppp. The pulse rate is one in two seconds. Now we have practically completed a very sketchy plan [very rough 'design']. The main parameters of the various parts have been computed preliminarily. As we are lack of experiences in designing high energy accelerators, we should like very much to send twelve people who are mainly accelerator designers to go to your Centre taking the plan mentioned above along with them, so as to ask for your advice and help. It will probably take one to two months to do it. The main subjects to be discussed with your experts are tentatively the following:

- Injecting system
- Ejecting system
- Magnetic system
- Beam transport system
- High-frequency accelerating system
- Power supply system of the main magnet."

The letter then gave details of the twelve people and continued:

"Thirdly, to develop more effectively the scientific exchange between us, we should like to invite five experts from CERN to visit China. I hope you would kindly consider to send your experts from the injection and ejection system, high frequency system, magnetic system, etc. After you decide the exact persons to come, please write me and let me know about it.

"We are prepared to finance the cost of sending our staff to your laboratory and their expenses while they are in Geneva, and the expenses of your experts when they are in Peking.

"I certainly believe that the friendship between the peoples of China and of the various countries in Europe will be further developed through such scientific exchanges and mutual visits between us."

57. Adams replied positively, in a letter dated 10 February 1978 and again on 9 March 1978, giving his agreement to the visit of the four accelerator specialists whose names were given by Chang Wen-yü in a letter dated 3 March 1978. Adams said:

"I am very glad that the cooperation and scientific exchanges between our two laboratories will develop rapidly in the coming few years."

58. The next step however was on the diplomatic level in that the Chinese Ambassadors in Berne (Li Yun-tchouan) and in Geneva (An Chih-yuan), together with some of their senior colleagues, visited CERN on 22 March 1978. After a tour of some of the major facilities they were entertained to lunch by the two Directors-General, Adams and Van Hove.

59. At almost the same time the National Science Conference took place in Beijing at which the main speech was given by Fang Yi\(^*$, the Vice-Premier responsible for science and technology. He outlined an eight-year scientific programme calling for the modernization of agriculture, the development of high-energy physics (including the construction of a 30 to 50 GeV proton synchrotron, to be built within five years), space exploration, and the expansion of atomic energy projects.

\(^*$ Fang Yi has been a Vice-Premier and State Minister for Science and Technology since 1978; he was a Vice-President of the Academia Sinica 1977–1979 and was President from July 1979 until June 1981, when a physicist Lu Jiaxi was elected by the Scientific Council of the Academy. He was previously (1969–1976) Minister for Economic Relations with Foreign Countries.
60. The four Chinese accelerator specialists mentioned in paragraph 56 arrived at CERN at the end of March. They were Ho Lung, an electrical engineer and Head of the Accelerator Division of the Institute, Fang Shou-hsien, an accelerator design engineer, Tsao Tsan, a magnet engineer, and Han Tsien, a specialist in injection and ejection problems for accelerators. (See Plate 10.) Very soon after their arrival, one of them (Fang Shou-hsien) gave a seminar entitled "Design considerations of a 30–50 GeV proton synchrotron of the Institute of High Energy Physics, Academia Sinica, Peking". The preliminary design had a 200 MeV linac feeding a synchrotron about 460 m in diameter with a peak magnetic field around 1.6 T. The anticipated intensity was about $5 \times 10^{12}$ ppp, at a repetition rate of about one pulse every 3 s.

61. In the reverse direction, John Ellis, a leading theoretical physicist from CERN, and Steinberger, spent seventeen days in China in April 1978 by personal invitation, and gave lectures in Beijing, Guangzhou and Shanghai, and also visited Xian.

62. In June 1978 Tsien San-siang, one of the Vice-Presidents of the Academia Sinica, who had been present at the discussions between Adams and Deng Xiaoping the previous September, paid a one-day visit to CERN together with Ambassador An Chih-yuan. (See Plate 11.) They had a meeting with Adams and Van Hove to discuss future plans for the collaboration; Tung was also present at this meeting.

Tsien San-siang mentioned that the Institute of High Energy Physics would like to send three theoretical physicists for some months as the next group of visitors to CERN. After this they thought to send a group for a short stay to study general services and also detector developments, as well as a group to study problems associated with the building of a large accelerator, such as civil engineering, tunneling, and safety. At a later stage the Academy would like to send a group of top-level administrators to see what a large international accelerator laboratory looked like. Adams stressed the desirability of proceeding step by step and mentioned that experience had shown that four or five people in one area of work was the maximum that could usefully be accommodated by the appropriate CERN group.

Van Hove suggested that it would also be useful if scientists from China could come regularly to CERN for scientific meetings, Summer Schools, and study groups. He said that he was aware of the IUPAP problem with respect to large international conferences (see paragraph 25) but that there were many European Conferences for which this problem did not arise.

63. In August 1978 the Chinese Mission in Geneva announced the impending arrival of five Chinese scientists, the three theoretical physicists mentioned above and two linac engineers. One of the theoretical physicists was Tu Tung-sheng, who was the leader of the group which was at CERN in the summer of 1976. Chang Wen-yu followed this up with a letter to the Directors-General, dated 16 August 1978, describing in more detail the specializations of the five people and in addition he asked if two radio-protection experts could come to CERN for a few months. Lastly, he invited one of the CERN accelerator theoreticians, E.J.N. Wilson, to visit the Institute in Beijing for a month in the autumn, and extended an open invitation to other CERN experts in different fields.

64. Adams and Van Hove replied on 13 September 1978, agreeing to the proposals of Chang Wen-yu and suggesting that W. Pickl of the PS Linac Group could accompany Wilson on his visit in October. They said that it was not possible to send more CERN experts that year owing to many other commitments at CERN, especially the new project of accelerating intense antiproton beams to high energies, which was then receiving increasing attention. Exchanges of letters (or cables/telexes), such as these just quoted, set the pattern for the exchange of physicists and engineers for the subsequent years which, apart from occasional visa difficulties, became almost a routine matter between the Institute and CERN.

65. Two of the four accelerator engineers mentioned in paragraph 60 above had returned to Beijing by August 1978. In September one of them (Ho Lung) wrote to Tsao Tsan (see paragraph 60) asking him to
Plate 10  Four accelerator experts at CERN, April 1978, seen with E. Powell of the Press and Visits Service. From left to right Tsao Tsan, Ho Lung, Han Tsien and Fang Shou-hsien. (Photo CERN)

Plate 11  On a visit to CERN in June 1978, from left to right, Ambassador An Chih-yuan, Fang Shou-hsien, S.C.C. Ting, Tsien San-tsang and unknown. (Photo CERN)
enquire if CERN could give substantial help with the linac part of the Chinese accelerator and in particular with its computer control. This request was discussed by Adams and Crowley-Milling and a positive answer was given verbally to Tsao Tsan for communication to Ho Lung. As a result, a year later, a group of five linac engineers arrived at CERN. Meanwhile, also in September 1978, the two engineers mentioned by Chang Wen-yü arrived at CERN for a stay of three months. They were followed in November 1978 by the three theoretical physicists.

66. In October a high-level delegation from the Academy of Sciences visited CERN for a day. They were led by one of the Vice-Presidents of the Academy, Hu Ke-shi. It turned out that the Deputy Leader of the Delegation, Huang Kun, was a young research worker in physics at the University of Bristol in 1947 when the author was an undergraduate there!

67. Wilson visited China during the month of October 1978, being joined from 12 October by Pirkl who stayed until 6 November. They spent about two weeks in Beijing giving lectures and seminars as well as participating in many discussions. They also visited the site for the new accelerator, which is about 35 km north-west of Beijing, near the Ming Tombs. They were then taken on a fascinating tour of Guilin, Hangzhou, and Nanjing, by Fang Shou-hsien, who had spent some time at CERN earlier in the year. (See Plate 12.)

68. At the end of 1978 there were four Chinese scientists at CERN, although five others had come during the course of the year as described above. The total stay in 1978 of these nine people amounted to 2.7 man-years. Apart from the group of eight scientists at CERN for 1–2 months in 1976, the year 1978.

Plate 12 E.J.N. Wilson (second from left), W. Pirkl (fourth from left) and Fang Shou-hsien (extreme right) at Guilin airport, October 1978. (Photo X)
may be taken as the first year of the exchange of scientists between CERN and Beijing on a systematic basis.

69. The first Chinese scientists to visit CERN in 1979 came to the Laboratory on 4 January for a few days. They were five experimental physicists who were on their way back to China after a visit to the United States. Max Reinharz, of SPS Division, and a few colleagues showed them around and discussed problems of common interest.

70. A second and larger delegation came to CERN in February. Chang Wen-yü had already written to the Directors-General on 8 December 1978 saying:

“In the February next year we should like to send a delegation ... to CERN to discuss the possibility of enlarging the cooperation between CERN and our Institute. The members of the delegation are: Lin Tsung-tang, delegation leader (chief engineer in charge of overall engineering work of the construction of High Energy Physics Centre of China); ...”

71. The delegation of seven people arrived on 16 February 1979 from the United States where they had spent several weeks visiting the various high-energy laboratories such as Argonne, Berkeley, Brookhaven, Fermilab, and SLAC. On Sunday 18 February, Eddy Powell (Press and Visits Service), Lock and Wilson took the delegation on a bus trip to Gruyères and Grandson. (See Plate 13.) Unfortunately the weather was very misty, but an excellent lunch was enjoyed at the Restaurant St-Georges in Gruyères, and Lock and Wilson spent much of their time in the bus listening to the views of Lin Tsung-tang on the sixteen topics that he wished to discuss, in preparation for the formal meetings of the following days.

72. 19 and 20 February were spent in discussions and in visiting the various installations of CERN. (See Plate 14.) A comprehensive plan was drawn up for the development of the collaboration, involving the visits to CERN from China of both individual scientists to stay for periods of six months to one year and of delegations or groups of specialists to stay for a few weeks. For the first category of visitor, CERN agreed to accept scientists in the fields of linac computer control, radiation protection, particle cooling techniques, accelerator application programmes, accelerator design, and experimental and theoretical physics. In the second category it was agreed to accept groups in the fields of high-vacuum techniques, main-ring services, site problems, workshop techniques and the planning of workshop facilities and management questions, radio-frequency studies, main computer controls, and computer-centre operation.

73. During the remainder of 1979 the collaboration evolved along these general lines, although a little more slowly than had originally been proposed. Two radiation-protection specialists arrived in February 1979 and a third one came in September 1979 together with two experimental physicists who joined the group of W. Willis, a senior physicist in the Experimental Physics Division. Three more experimental physicists came in October 1979, who joined the group of Steinberger, and also five engineers who joined the Linac Group in the Proton Synchrotron Division. They were followed in November by two accelerator physicists to work with Wilson. At the end of the year there were fifteen Chinese scientists at CERN; the total number who had come for long stays during the year was nineteen, making in all 7.4 man-years, compared with the 2.7 man-years during the previous year.

74. Two more delegations came to CERN during 1979. One was a group of twelve people concerned with the architecture and conventional facilities for the High Energy Physics Experimental Centre, who were at CERN for several weeks in October and November. The group was led by Yue Zhizhong, Deputy Director of the Preparatory Department for the Construction of the Centre; he was accompanied by four engineers from this Department, as well as by architects and engineers from the Beijing Municipal Commission for Capital Construction, the City Planning Bureau, the Municipal Prospecting Department, the Beijing Municipal Architectural Design Institute, and from the Traffic and Non-Industrial Bureau of the State Commission for Capital Construction.
Plate 13  At Grayevos, February 1979. From left to right: Mrs. Kung Hai and Cheng Wen-to (Chinese Mission in Geneva), Li Chang-fa, Yin Zhi-ic, Lin Tsung-tang and Xie Gia-liang. (Members of the delegation led by Lin Tsung-tang; see paragraph 71). (Photo E.J.N. Wilson)

Plate 14  In the SPS tunnel, February 1979. From left to right: Mrs. Lu Xian-lui, Lin Tsung-tang, Xie Gia liang, E.J.N. Wilson, Zhou Bei-lung, Zhu Yu-zheng, G. Schröder, and Yin Zhi-ic. (Members of the delegation led by Lin Tsung-tang.) (Photo CERN)
75. The second was a group of six computer control specialists who came to CERN for two to three weeks in November, after spending some time at DESY, Hamburg. Like many other delegations they then went on to visit laboratories in the United States.

76. Apart from the visits described in the preceding paragraphs, there were three other opportunities for Chinese scientists to visit CERN in 1979. One was the occasion of the celebration of the 25th Anniversary of the founding of CERN, marked by a formal ceremony on Saturday 23 June, which was attended by two Deputy Directors of the Institute of High Energy Physics in Beijing, Tzu Hung-yuan and Mr. Ji Cheng-long. The second was the occasion of the EPS (European Physical Society) International Conference in Geneva in July, which was attended by three scientists from the Institute of High Energy Physics, two from the University of Beijing (including Hu Ning), and one from Lanzhou University. The third was a Workshop organized by CERN under the auspices of ICFA (the International Committee for Future Accelerators), held at Les Diablerets in Switzerland and at CERN, which was attended by Fang Shou-hsien and Ho Lung. (See Plate 15.)

77. In addition, three other groups came to CERN for a few days during the summer. One was a group of three experimental physicists led by Professor Chang Chung-yao, another was a group of seven metallurgists, and the last was a group of senior scientists led by Professor Chou Pei-yuan, a Vice-President of the Academia Sinica.

78. In the reverse direction, a group of CERN staff members, led by Max Reinharz, together with a number of wives and children, went to China in April 1979 under the auspices of the CERN Staff Association. The group consisted of sixteen adults and four children who were in China from 5 to 26 April. They first visited Beijing and spent one day at the Institute of High Energy Physics and a further day in discussions; eight members of the group gave seminars or led discussions on such topics as beam layout and installation problems, particle detectors, line problems, computer control, and neutrino physics. The group then went on to visit Xian, Shanghai, Hangzhou, Guantin, and Guangzhou.

79. Less than a month later, Adams and his wife arrived in Beijing for a second visit, accompanied by Lock and his wife. On their arrival on 7 May 1979 they learnt that Chang Wen-yi was in hospital with heart trouble and their host was Deputy Director Tzu Hung-yuan, a theoretical physicist. He told them that there had been a recent economic review which had resulted in a slowdown of development plans generally in China. High-energy physics research was still given priority but the accelerator would have to be constructed over more years. Also they could order less from outside China and the number of people they could send abroad had to be reduced.

80. During their stay in Beijing, Adams and Lock visited the Institute, where they saw many new buildings under construction including large workshops and assembly halls. At the National Commission for Science and Technology, they were received by Deputy Director Chao Tung-wan and shown a small exhibition of the technology that had been developed for the new accelerator during the previous year or so. They also visited the site for the new accelerator and Adams discussed various geological problems with the resident site engineer. Several discussions took place with senior members of the Institute at the Beijing Hotel, over lunch at the Summer Palace, and over dinner at the Imperial Palace Kitchen in Beijing at which the hosts were Tsien San-siang, Vice-President of the Academia Sinica, and Chao Tung-wan. The discussions again covered the manufacturing problems of the accelerator and revealed that the immediate responsibility for the project was that of the National Commission rather than the Academia Sinica.

81. The highlight of the visit was a meeting in the People's Palace with Vice-Premier Fang Yi, who was personally charged by Vice-Premier Deng Xiao-ping to look after the Institute and the construction of the accelerator. (See Plate 16.) Fang Yi was very well informed of all aspects of the project and the discussion covered many of the problems of constructing the components of the machine in China. He asked about
Plate 15  Ho Lung (left) and Fang Shou-hsien at the ICFA Workshop in Les Diablerets, October 1979. (Photo X, from the Proceedings)

Plate 16  J.B. Adams with Vice-Premier Fang Yi in Beijing, May 1979. From left to right front row (starting second from left): W.O. Lock, Tsien San-tsiang, J.B. Adams, Fang Yi, Mrs. Adams, Zhao Dong-wan, Mrs. Lock, Lee Tao; second row left to right: Li Mingde, Li Chang-fa, Tzu Hung-yuan, Lin Tsung-tang and Lin Wai-tzu. (Photo X)
high-energy physics future plans at CERN and about cosmology in the future. Tsien San-tsiang and Tsu Hung-yuan were particularly active in this discussion.

1980: CONSOLIDATION OF THE COLLABORATION

82. The year 1980 was essentially one of consolidation of the collaboration. The Chinese scientists already at CERN stayed on for most of the year, although two of the radiation protection experts left in April. On the other hand, an engineer on leave from Lanzhou University, who had previously been with the firm of Haefely in Basle, joined SPS Division in March, while a young engineer from the Institute of High Energy Physics came in June to join the five already working in the Linac Group. Thus, throughout the year there were usually about fifteen Chinese scientists working at CERN on a long-term basis.

83. As in the previous two years a number of delegations visited the Laboratory. In January three electronics engineers came for a week on their way back from a tour in the USA and then went on to DESY, Hamburg. They were soon followed by a group of nine vacuum specialists led by Pan Hui-bao, one of the eight people who worked at CERN in the summer of 1976. They stayed for about a month. Soon after, in April, two computer specialists spent two weeks with the Data Handling Division.

84. In the reverse direction the number of CERN staff to visit the Institute in Beijing (and usually other cities in China also) increased considerably during the year. The first was the magnet expert Roy Billinge, together with his wife, who spent two weeks there in April-May. He gave five extensive lectures at the Institute in Beijing. Billinge was followed in August by Horst Wachsmuth, an experimental physicist who was on his way back to CERN after a sabbatical year in Madison, USA. Wachsmuth and his family spent a month in China, mainly as tourists, but he also visited the Institute and gave several lectures and seminars.

85. The next visitors to Beijing were a group of engineers from the Site and Buildings Division, namely H. Bakker, K. Braun, H. Laporte and his wife, and J. Rouel and his wife, who went in response to an invitation from Yue Zhizhong, who had led the delegation of construction engineers which had been at CERN towards the end of 1979. They first spent a week touring Guangzhou and other cities before arriving in Beijing, in early October, for a further two weeks of lectures and discussions on various aspects of the work of constructing the High Energy Physics Centre. Towards the end of their stay they were joined by Klaus Goebel and his wife, of the Radiation Protection Service of the CERN Health and Safety Division, who also spent three weeks in China. (See Plate 17.) A. Zichichi of EP Division was also in Beijing for 10 days in October in his capacity as President of the Italian Istituto Nazionale di Fisica Nucleare.

86. As during the previous year there were several other occasions when individual Chinese scientists came to CERN for short stays. One was that of the XI International Conference on High Energy Accelerators, held at CERN in July 1980. It was attended by three scientists from the Institute of High Energy Physics, one of whom was already working at CERN; the other two used the opportunity to stay a few extra weeks at CERN. A paper describing the projected Proton Synchrotron (BPS) was presented by Fang Shou-hsien at this Conference. (See Plate 18.)

87. Soon after the Conference, Chang Wen-yü himself came to CERN for a few days together with two of his senior colleagues from the Institute, Hu Ning from the University of Beijing, a senior official from the State Committee for Science and Technology, and a journalist from the Chinese News Agency Hsinhua. They were on their way back to China after an extended visit to the USA. It was the first time Chang Wen-yü had visited CERN since the collaboration had become firmly established, and he was very pleased to see the close relations which had been developed between the CERN staff members and the Chinese scientists and engineers. He wrote afterwards to the author saying: "We should like to thank you very much for the
Plate 17  K. Goebel with Liu Keqin (who spent some time at CERN in 1979-1980) in Hangzhou in October 1981 (see paragraph 85). (Photo K. Goebel)
Plate 18 W.O. Lock and Xue Jing-xuan at the International Accelerator Conference at CERN, July 1980. (Photo X, from the Proceedings)
warm hospitality extended to my colleagues and myself during our visit to CERN. The thoughtful programme which you arranged for us was excellent in every respect and will be well remembered. It was also of great interest for us to visit your research facilities and to know the excellent experimental work.”

88. The relations with the Chinese Mission in Geneva were further intensified during the course of the year. In January 1980 the Consul-General and some twenty of his colleagues came to CERN to visit the experimental facilities and to learn something of the work of CERN, which until then had been something of a mystery to them. They were entertained to lunch by the Directors-General. Ambassador An Chih-yuan, who had played an important role in establishing the relations between CERN and the Academica Sinica since 1975 (see paragraph 47), returned to China in the spring of 1980. His successor was Yu Peiwen, previously ambassador to Austria, who expressed his great interest in CERN by also coming to tour the site in June 1980.

89. Since the main body of this report was written, the Chinese Government has announced, early in 1981, that the project to build a 50 GeV proton synchrotron has been postponed because of economic difficulties. However, accelerator construction will continue at the site of the Institute in Beijing, although it has not yet been decided what type of machine should be built, in addition to the proton linear accelerator of which the first stage of 10 MeV should be completed by the end of 1982.

90. It is to be hoped that the successful scientific collaboration built up between CERN and the People’s Republic of China over the past ten years will continue in the future, albeit at a somewhat reduced level. What is certain is that close links and personal friendships have been established, which can serve as the basis for a future widening of the collaboration, when the general economic situation may be more favourable than it is now.

Acknowledgements

In writing this report I have had access to the archives of successive Directors-General, and I am grateful to Professor H. Schopper, the present Director-General of CERN, for permission to consult them and to Miss H. Schmal and Miss S.M. Tracy for supplying me with the necessary files. Many people have given me the benefit of their recollections of the early days of the collaboration, in particular Professors Chang Wen-yü, Tzu Hung-yuan, L. Van Hove, V.F. Weisskopf, C.N. Yang and Luke C.L. Yuan. They have also given me useful comments on the manuscript and encouraged me to proceed with its publication. Mr. W.S. Newman helped me to choose the photographs and made many suggestions to improve the manuscript while Mr. Xue Jing-xuan and Professor Tzu Hung-yuan aided me in the spelling of Chinese names. Mr. B. Southworth critically subedited the text, which was typed many times (but using a text processor!) by Mrs D. Lajust and I am most grateful to her for her patient work. Lastly I would like to thank the staff of the CERN Text Processing Unit and the Document Reproduction Section for their usual careful work.
Dear Professor Tsien,

As you undoubtedy know, the European Organization for Nuclear Research (CERN) has now reached a considerable level of scientific activity centering around its accelerators, the 28 GeV proton synchrotron and the 600 MeV synchro-cyclotron. This activity covers all aspects of elementary particle physics, both experimental and theoretical, and includes in addition research on nuclear structure and nuclear reactions by means of mesons and high-energy protons. As a major extension of its facilities, CERN is starting the construction of a pair of intersecting storage rings for 28 GeV protons.

In addition to having the closest relations with its thirteen Member States, which are all European nations*, CERN has regular contacts with scientists and scientific institutions of many other countries. These contacts are completely informal and consist mainly in short or extended visits of foreign scientists at CERN, and of our scientists abroad. They are mostly arranged on a small scale, for one or a few individual scientists at a time. They concern theoretical as well as experimental physicists. When necessary CERN provides full or partial support for such visits.

We regard it as very desirable to establish contacts of this sort with all nations whose scientific activities and interests include the broad fields of nuclear and elementary particle physics. In particular, we should like to have such contacts with China also. Knowing your personal competence and interest in nuclear and elementary particle physics, I write to you to ask for your help and support in promoting scientific contacts between China and CERN. In particular,

* The CERN Member States are: Austria, Belgium, Denmark, Federal Republic of Germany, France, Greece, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom.
my colleagues and I should be very glad if you and other Chinese physicists could come to CERN to spend some time in our laboratory, having discussions with our experimentalists or theorists, and possibly participating in our research programme. As I mentioned before, CERN could, if necessary, provide financial support for such visits, which could have any duration at the convenience of the visitor. Needless to say, we should also be glad to discuss any other form of scientific contact which you would care to suggest.

I have discussed the foregoing at length with Professor L. Van Hove, who for several years has been leading our Theoretical Study Division and is at present our Directorate Member for Research. He too is very anxious to promote the establishment of contacts between Chinese physicists and CERN, and he joins me in expressing the wish that it will soon be possible to take the first steps in this direction.

In the hope of a favourable reply, I send you my best regards.

Yours sincerely,

Bernard P. Gregory
Director-General
Annex II

Massachusetts Institute of Technology
Department of Physics
Cambridge, Massachusetts 02139

April 22, 1971

W. Jentschke, Director General
CERN
1211 Geneva 23
Switzerland

Dear Willy:

I am quite sure that all of you must have thought these days about establishing relations with the Chinese high energy physicists. Obviously, I am very much in favor of such a step, and I should like to urge you to invite some people to the Amsterdam conference and to the CERN accelerator conference.

Some people have raised some doubt as to whether the presence of Chinese physicists would make it more difficult for the Russians to come. I personally don't think that this would make any difference. However, if you or some people think one should be careful, I would suggest to find out informally from our Russian colleagues when some people visit Serpukhov.

There is, of course, a question of how and who should be invited. I do not know of any specific Chinese physicists. If one does not find any names, the best method would be to extend a general invitation to the Academy.

I hope such actions will be successful. After all, it is our duty to build bridges as soon as it seems hopeful that they will be used. We are going to invite some Chinese physicists to some conferences in America.

Sincerely,

Victor F. Weisskopf

VFW: gpm
Dear Dr. Chang,

I write on behalf of the European Organization for Nuclear Research (CERN) to express our interest in establishing contact with you and your colleagues at the Institute of Nuclear Physics in Peking.

CERN is an international institution devoted to research in high energy nuclear physics *). In our laboratories near Geneva, Switzerland, we operate a synchrotron and intersecting storage rings for 28 GeV protons, as well as a 600 MeV proton-synchro-cyclotron. We are also building a new proton-synchrotron of 300 GeV.

Our research programme includes all aspects of elementary particle physics as well as nuclear physics experiments on complex nuclei, in particular the production and investigation of short-lived nuclides by means of high energy protons.

It has always been CERN's policy to foster scientific collaboration with all institutions which are active in its broad field of science, also in non-European countries. It is in this spirit that I would like to invite

*) The Member-States of CERN are: Austria, Belgium, Denmark, Federal Republic of Germany, France, Greece, Italy, Netherlands, Norway, Sweden, Switzerland and United Kingdom.
you and your collaborators to pay a visit to our laboratories in Geneva. From our side, we would also be pleased to send some of our senior scientists to visit your Institute in Peking. We are convinced that it would be of great interest to initiate scientific contacts through such visits.

I would be very glad to hear your views on these matters, and I close by expressing the hope that you will be able to accept my invitation.

With best regards,

Yours sincerely,

W. Jentschke
Director-General,
CERN Laboratory I
Dear Professor Chang,

I was very sorry that last month when we had the honour of receiving your scientific delegation at CERN you were prevented by other engagements from visiting us. Professor Luke Yuan has told me that he has since had the pleasure of meeting you and discussing the possibility of an exchange of scientific visits on the lines which we had suggested in our earlier letters to you.

As you know, CERN is an international institution devoted to research in high-energy nuclear physics. In our laboratories near Geneva, Switzerland, we operate a synchrotron and intersecting storage rings for 28 GeV protons, as well as a 600 MeV proton synchro-cyclotron. We are also building a new proton synchrotron of 300 GeV.

Our research programme includes all aspects of elementary particle physics as well as nuclear physics experiments on complex nuclei, in particular the production and investigation of short-lived nuclides by means of high-energy protons.

* The Member States of CERN are: Austria, Belgium, Denmark, the Federal Republic of Germany, France, Greece, Italy, Netherlands, Norway, Sweden, Switzerland and the United Kingdom.
It has always been CERN's policy to foster scientific collaboration with all institutions which are active in its broad field of science, including those in non-European countries. It is in this spirit that I would like to invite you and your collaborators to pay a visit to our laboratories in Geneva. From our side, we would also be pleased to send some of our senior scientists to visit your Institute in Peking. We are convinced that it would be of great interest to initiate scientific contacts by means of such visits.

I would be very glad to hear your views about how we might proceed and I greatly hope that having established direct contact we will soon be able to arrange some scientific exchanges.

I have sent a copy of this letter for information to President Kuo Mo-jo, of your Academy, and also to your Ambassador in Berne, Mr. Tchen.

With best regards,

Yours sincerely,

W. Jentschke
Director-General,
CERN Laboratory II
Professor W. Jentschke,
Director-General,
CERN Laboratory 1,
1211 Geneve 23,
Suisse/Switzerland.

W. Y. Chang,
Institute of Atomic Energy
Academia Sinica,
Peking, China.


Dear Professor Jentschke,

Thank you very much for your letter of 15 Dec. 1972, in which you have suggested the possibility of an exchange of scientific visits between our two Institutes and also have kindly outlined the work you have done in your Institute. We have been considering your suggestion and shall exchange views with you about this matter again.

We would also like to thank you very much for sending us the reprints and the CERN Courier, which we have received during the last few months.

I was also very sorry that we could not visit your Institute when we were in Europe, because of the tight schedule which was previously arranged by our hosts, hoping to have a chance to do so in the future.

With best regards,

Sincerely yours,

W. Y. Chang

[Signature]
NAME LIST
OF
THE VISITING GROUP OF HIGH ENERGY PHYSICISTS OF
THE SCIENTIFIC AND TECHNICAL ASSOCIATION OF CHINA

HEAD OF THE GROUP

PROF. CHANG WEN-YÜ
(张文裕)
Deputy Director of the Institute of Atomic Energy,
Academia Sinica, Peking
Speciality: High Energy Physics

DEPUTY HEADS OF THE GROUP

PROF. CHU HUNG-YUAN
(朱洪元)
Head of the Theoretical Physics Division of the Institute of Atomic Energy, Academia Sinica, Peking
Speciality: Theoretical Physics

ASSOCIATE PROF. KUAN WEI-YEN
(管惟炎)
Deputy Head of the Low Temperature Physics Division of the Institute of Physics, Academia Sinica, Peking
Speciality: Superconductivity

MEMBERS OF THE GROUP

MR. SHAN TSUNG-SU
(单宗肃)
Chief Engineer of the Nanking Electronic Tube Manufacturing Works
Speciality: Electronic Tubes

PROF. TING YU
(丁渝)
Senior Scientist of the Institute of Atomic Energy, Academia Sinica, Peking
Speciality: Microwave Superconductivity

MR. WANG CHUAN-YING
(王传英)
Chief Engineer of the Accelerator Division of the Institute of Atomic Energy, Academia Sinica, Peking
Speciality: Low Energy Accelerator
MR. MAO CHEN-LUNG (毛振隆) Engineer of the Research Institute of Mechanical Engineering, the First Ministry of Machine Building. 
Speciality: Accelerator

MR. FANG SHOU-HSIEN (方守賢) Scientist of the Accelerator Division of the Institute of Atomic Energy, Academia Sinica, Peking 
Speciality: Accelerator

MR. WANG CHU-HSIANG (王祝翔) Scientist of the Institute of Atomic Energy, Academia Sinica, Peking 
Speciality: Experimental High Energy Physics

MR. CHANG CHING-KUO (張慶國) Scientist of the Accelerator Division of the Institute of Atomic Energy, Academia Sinica, Peking 
Speciality: Accelerator

MR. SHEN PAO-HUA (沈寶華) Engineer of the Accelerator Division of the Institute of Atomic Energy, Academia Sinica, Peking 
Speciality: Accelerator

MR. HSU SHAO-WANG (徐紹旺) Engineer of the Accelerator Division of the Institute of Atomic Energy, Academia Sinica, Peking 
Speciality: Accelerator

SECRETARY AND INTERPRETER OF THE GROUP

MR. WANG JEN-CHUAN (王仁全) Secretary of the Bureau of Foreign Affairs of the Scientific and Technical Association, People's Republic of China
SUMMARY OF THE FINAL DISCUSSIONS BETWEEN CERN AND THE
VISITING GROUP OF HIGH ENERGY PHYSICIANTS FROM THE
PEOPLE'S REPUBLIC OF CHINA, HELD AT CERN, GENEVA, ON 4 JULY 1973

Present

From the People's Republic of China
Professor Chang Wen-Yu
Professor Chu Hsing-Yuan
Associate Professor Kuan Wei-Yen
Professor Ting Yu
Mr. Wang Jen-Chuan
Mr. Chang Chun-Shan
Mr. Lu Ching-Ting

From CERN
Dr. J.E. Adams
Professor W. Jentschke
Professor L. Van Hove
Dr. W.G. Look

From the USA
Professor V.F. Weisskopf
Professor L. Yuan

Dr. Adams opened the discussion by stating that CERN would be pleased to welcome a few Chinese scientists either via our Visiting Scientist programme or supported by China. Professor Jentschke agreed and said that one should not talk about large numbers now but simply start with a few people depending on the wishes and the possibilities of the Chinese authorities.

Professor Weisskopf remarked that it was not the financial problem that was important. The essential difference between CERN and the USA was that CERN could accept a few visitors from China quite informally, which the United States could not do.

Professor Chang stressed that his group was a study group which had to report back to the appropriate authorities in China. He agreed with Professor Weisskopf that the financial question was not important. Since the Cultural Revolution China had not sent people abroad to gain experience and does not yet have a policy of doing so - this would have to be established.
Professor Jentschke mentioned that CERN could also send a few experts to China to advise and help in any high energy physics programme which might be established. Dr. Adams added that he felt that if Chinese accelerator specialists came to CERN as visitors they should do so for at least one year in order to benefit fully from their stay and make a useful contribution at CERN. Professor Van Hove remarked that for theoreticians short visits (4 to 6 weeks) would be useful and beneficial and easy to accommodate within the Visiting Scientist programme. Professor Jentschke stressed again that visits in both directions could be organised quite informally.

There was then a brief discussion on the exchange of documentation, preprints and reprints etc. Professor Chang gave a short list of institutes to which it would be useful to send CERN Yellow Reports and the list of reprints available.

Lastly Professor Chang expressed his thanks to CERN for the hospitality extended to himself and his group.

W.O. Look
Dear Prof. W.K. Jentschke:

On behalf of the Institute of High Energy Physics of the Academy of Sciences, People’s Republic of China, I should like to invite you and certain other friends from CERN as the guests of the Institute to visit China for a period of three weeks. We agree that the time for your visit, as you have suggested, would be from sometime in August and September on 1975, as it is convenient to you all. Your accommodations during your stay in China will be bared by us.

The letters of invitation are also being sent to the following friends:

Prof. V.F. Weisskopf,  
Prof. J.B. Adams,  
Prof. L. Van Hove,  
Prof. J. Steinberger,  
Prof. G. Charpak,

Two of the above mentioned friends had expressed the wish to bring families along with them in this visit. I fully understand such good will from our friends, but it would be quite difficult to carry it out, because we have too heavy a task to accommodate foreign guests this year. For this I feel really regretful. I hope you would understand this situation.
We hope that these invited friends of CERN could visit China altogether and would kindly tell us the concrete time of your visit as soon as possible. Please obtain your entry visas from the Chinese Embassy in Berne, Switzerland.

I am certain that your visit will be beneficial to the further promotion of the friendship and scientific exchange between the scientists of China and that of other countries all over the world.

With best personal regards to you.

Yours sincerely

Wen-Yu Chang

Leading member of the Revolutionary Committee of the Institute
Further contacts with China

In the Summer of 1973 a delegation of physicists from the Peoples Republic of China, headed by Professor Cheng Wen-Yu, made an extensive tour of high energy physics laboratories in the USA concluding with a week's visit to CERN. In September there was a return visit from CERN by W.K. Jantschke (Director General of Laboratory I), G. Charpak, L. Van Hove and W.F. Weissskopf. The invitation for this visit proved to be much more than an act of reciprocal hospitality. The discussions in China were wide-ranging and thorough and carried the contacts between the scientific communities a stage further.

Since the 1973 tour, the Academia Sinica (the Chinese Academy of Sciences) has decided to establish an Institute of High Energy Physics headed by Cheng Wen-Yu. This is now being set up in Peking with a sizable staff. The Institute is to work on theoretical high energy physics, particle detector instrumentation and high energy accelerator studies. Obviously, in order to participate in experimental high energy physics from within China, the choice of an appropriate accelerator at this stage of the research is not easy.

The tour of the CERN group centred on Peking and Shanghai; it took in several Universities, Institutes and factories. The visitors saw, for example the work on controlled thermonuclear fusion (involving laser technology and a mini-Tokomak) at the Institute of Physics at Peking, on computers (1 µs per operation) at the University of Peking where there is a theoretical group in high energy physics, on lasers, thin films and integrated circuits at Tsing Hua University, on reactor technology at the Institute of Atomic Energy in Peking, on nuclear physics involving the use of a cyclotron (including isotope production) at the Institute of Atomic Energy Shanghai... Some very fine work, often emerging from modest means, was seen in the field of instrumentation. This included integrated circuits, many other electronic instruments and multiwire chambers (a follow-up from a chamber passed by Charpak to the Chinese delegation in 1973). It was also obvious that part of the role of the Universities is seen as that of research centres to feed knowledge into industry.

Despite their achievements, the hosts insisted that China is a 'developing' country in need of scientific and technical input from the 'developed' countries. Together with this, however, there was strong emphasis on self-reliance. Though avid to learn from experience elsewhere, they insist that it must be the Chinese people themselves that do the work and apply the knowledge.

At Peking and Shanghai, the CERN visitors gave lectures on the present status of high energy physics and its organization in Western Europe. These talks, particularly in Peking, were followed by long, animated discussions which revealed that the Chinese physicists are well up-to-date with recent developments and able to partake in informed debate on current theories.

On 13 September in Peking, there were two important discussions concerning the future development of the relationships between the scientific communities. In the morning, the interest of the Chinese physicists in continuing the contact was expressed by Professor Chien-Shan-Tsang, Vice-Chairman of the Institute of Atomic Energy during a tour of the Institute. This was reiterated by Professor Wu Yiu-Hsun, Vice-President of the Academia Sinica, at a dinner offered to the CERN visitors in the evening.

These exchanges led to a highlight of the tour — a meeting with Wu Leihn-Fu, Vice-Chairman of the Standing Committee of the National Peoples Congress. The Vice-Chairman said that China wishes to see the contacts and exchanges with high energy physicists, particularly of CERN, extended and again stressed the readiness of China to learn from scientific and technical experience elsewhere.

In concluding discussions with Cheng Wen-Yu, Tsu Hong-Yen and Tu Tung-Sheng of the Institute of High Energy Physics, future exchanges of information and of people were discussed. Concerning the exchange of people, we can finish with a typical Chinese proverb quoted by Wu Leihn-Fu — One eye is better than a hundred ears!
"The modernization of science and technology is the critical question in the four modernizations. We must have scientists and technicians of the world’s first rank. We must have the most advanced scientific research facilities. There must be great theoretical creativity and technical inventiveness and in the most important fields of science and technology we must approach, reach or exceed the world’s advanced levels so as to put our country’s economy in the foremost world ranks. The natural sciences are at present working for important breakthroughs. Now advances in natural science are bound to result in tremendous changes in techniques of production. Without scientific experiment, without new techniques, labour productivity cannot be raised greatly, new leap forwards cannot be made, the superiority of our socialist system cannot be displayed to the full, and the danger of lagging behind and being open to attacks will exist. Whether science and technology can be pushed forward as quickly as possible is a question of vital importance for socialist construction as a whole and for the destiny and future of our country."

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HSINHUA AGENCY

NEWS BULLETIN

No. 6052  Tel. 669438  Tuesday, 27 September 1977

092620 -- Deputy Prime Minister Teng Siao-Ping meets the Director-General of CERN.

Peking, 26th September 1977 (Hsinhua) -- The Chinese Deputy Prime Minister Teng Siao-Ping said today:

"Our aim is to bring the scientific and technological development of our country as close as possible, before the end of the century, to the most advanced levels in the world at that time; many of our branches of science will be able to attain such levels and some will go even further. We will be in a position to make inventions which will contribute to human progress."

Deputy Prime Minister Teng Siao-Ping made these remarks during the friendly talk he had this morning with John Bertram Adams, Director-General of CERN, his wife and also M.C. Crowley-Milling, Director of the Accelerator Department at CERN. Deputy Prime Minister Teng added:

"In order to achieve this aim, we must recognize how far behind we are in this field. In this way we will be able to make progress. Taking the most advanced levels of science in the world today as our starting-point, we must make an honest and modest study of all the highest forms of science and technology and make new inventions. Now that the "Gang of Four" has been defeated," he continued, "we have opened the way for the initiative of our scientists and of the masses, confident that our aim will be fulfilled."

The Director-General, John Bertram Adams, added:

"You have a very worthy goal, great faith and tremendous potential; you are sure to attain your aim."
Those present on this occasion were Li Tchang, head of the Chinese Academy of Sciences; Souen Yeou-Yu, Deputy Minister of the First Ministry of the Engineering Industry; Tsien San-Kiang, Assistant Secretary-General of the Chinese Academy of Sciences; Chang Wen-Yu, Director of the Institute of High Energy Physics within the same Academy, and also the heads of the departments concerned: Wang Sin-Min, Hao Ting, Li Tao and Ho Houa-Cheng.

(Translated from the French)
ANNEX XII

ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLÉAIRE
EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

SIÈGE: GENÈVE, SUISSE

Professor Chang Wen-yu
Institute of High Energy Physics
Academia Sinica
P.O. Box 918
Peking

The People's Republic of China

Votre/Your ref. Notre/Our ref.
DGE/561-77

Geneva, 23 November 1977

Dear Professor Chang,

During my recent visit to Peking we discussed the possibilities of collaboration between the High Energy Physics Institute of the Chinese Academy of Sciences and CERN. I wrote to you after my visit saying that we were consulting our Authorities about this collaboration, and thinking about the form it could take.

I am happy to inform you that no difficulties were foreseen by our Authorities to a collaboration between your Institute and CERN, and we are therefore now able to put forward for your consideration our ideas on the way such a collaboration could be set up.

We start from the position that for several years the collaboration will be mainly in the direction of transmitting to your staff information and expertise built up at CERN over many years, so that they can design and build the equipment you need and carry out the research which that equipment will make possible. We expect that later on the collaboration will come into balance as regards the flow of information. We have therefore concentrated on the first period when the flow of information is mainly from our laboratory to yours.
As we discussed in Peking, the information and help you ask for falls into three categories:

- the design and construction of the accelerator and its subsequent operation,
- the design and construction of experimental equipment and its use for research,
- theoretical physics.

Since information in these three categories can best be transmitted by people, the collaboration would take the form of your staff working at CERN and some of our experts visiting your laboratory.

I understood from our conversations in Peking that the Academy of Sciences is prepared to finance the cost of sending your staff to our laboratory and their expenses whilst they are in Geneva, and the expenses of our experts when they are in Peking.

Clearly, the length of time that your staff would stay at our laboratory depends on the category of information and help with which they are concerned.

For the design and construction of accelerators, short visits may be useful, but longer stays, up to one year, will be necessary in order to gain experience. The same applies to the design and construction of experimental equipment. For experimental research experience, however, a relatively long stay, of, say, one or two years would enable your staff to join an experimental group at CERN and participate in an experiment. In the field of theoretical physics, short and longer stays seems equally appropriate.

Since we imagine that there might be some five to ten of your staff at CERN at any time, some staying for short periods and others for longer periods, one of them should be appointed the leader of the team and stay for a long period so that we have one person with whom to arrange the details of the collaboration and to sort out any problems which arise. Our experience with other similar collaborations is that this arrangement is the most efficient.

With regard to fitting your staff into the work going on in our laboratory, our experience is that this problem can only be solved in a satisfactory way if sufficient details about the visiting scientists are sent to us well in advance. These details would include:

- professional abilities and experience
- field of work or interest
- language abilities (English or French)
- length of stay at CERN and dates proposed.
In case of junior scientist or engineers, the professional abilities should best be described in letters of reference written by senior scientists or engineers. If this information is sent to us several months in advance, we can let you know whether or not we can find a place for the scientist in our laboratory. If our findings are positive, we can then agree together when he can come.

With regard to your scientists joining groups carrying out experiments at CERN, we need the agreement of the group itself since all our experimental groups are mixed teams from many European universities containing very few, if any, CERN staff.

Finally, we suggest that we begin this collaboration in a modest way with a few of your staff coming to CERN, and that we learn by experience how to make it work efficiently.

I hope these ideas on the form our collaboration could take will be acceptable to you and we look forward with pleasure to your reply. May I add that we greatly welcome this collaboration between our laboratories and will do everything we can to make it a success.

With my kindest regards,

Yours sincerely,

J.B. Adams
Executive Director-General