# Inauguration of the Shing-Tung Yau Center at Tsinghua University

## Prof. Shing-Tung Yau's Speech at the Opening Ceremony, March 19, 2015

Minister Du, Professor Xu Chen, leaders of Tsinghua University, and friends in China and abroad, thank you for coming to celebrate the inauguration of the Yau Mathematical Sciences Center.

I have been helping to develop the field of mathematics in China for thirty-six years. As Prof. Lo Yang remarked in his speech, my first visit to Beijing was in 1979. At that time, I taught at Stanford University and received an invitation from Professor Loo-Keng Hua, whom I had admired since my childhood. Upon receiving Prof. Hua's letter, I was eager to visit. Since then, my life has become inextricably bound with China, particularly its mathematical community.

I am now deeply moved by the tremendous development that has occurred in China over the past thirty-six years. Our motherland has evolved from an extremely poor country in 1979 to a vibrant economic power today. I am very glad to have witnessed such great achievements. During the same period of time, mathematics research in China has also begun to advance and expand to reach to the frontiers, and it is attracting worldwide attention. During this development, mathematics research has enjoyed the devotion of many mathematicians. It, of course, has also enjoyed support from leaders of the central government, from the Chinese Ministry of Education, and from universities.

I grew up in Hong Kong when it was still a colony. So, I have at least some conception of provincial territories within China. My sense was that I was in a colony and China was my motherland. Therefore, for the prosperity of our motherland, I hope mathematics will thrive everywhere in China—be it Beijing, Shanghai, Zhejiang, Taiwan, or Hong Kong.

Over the years, I have established several math centers in various places. My goal is simply to see that China could develop a subject as fundamental as mathematics. I am very grateful that most Chinese mathematicians share my convictions. Professor Lo Yang is a good friend as well as a long-time friend. Ever since we met for the first time, and for the past several decades, he has given us tremendous support.

There are many others from around the world who have helped the development of Chinese mathematics education and research.

Starting in the Chinese Academy of Sciences, I have set up research centers and groups at various places in China; I have also trained dozens of Chinese students abroad. Some of them are here today. In fact, I encourage them to return to China so that we might collaborate in improving mathematics in China. We have also received help from many mathematicians within China: There are many like-minded people at Tsinghua University, the Chinese Academy of Sciences, and Zhejiang University providing us with strong support. Together we have selflessly devoted our time and energy to organize and support various mathematics activities. As Prof. Lo Yang said earlier today, some activities seem to be very difficult, and we often encounter unexpected setbacks and hurdles. However, with passion and devotion we can overcome all difficulties in the advancement of mathematics research and education in China.

The support and push for such an advance is not only due to the energy of our colleagues inside China, but also to the enthusiastic involvement of colleagues from overseas. Our friends from outside China sometimes understand our ideas better than some local colleagues, for they always view China as a whole, and disregard regional distinctions. Regardless of whether a program is in Beijing or Shanghai, they are always willing to spend time to help. In the

audience, there are already several such prestigious mathematicians from abroad. I invited them to help with the Chinese University of Hong Kong—and there they were. I invited them to help with Zhejiang University. They came. I invited them to Taiwan University or Taiwan Chiao Tung University, and they came. And if I invited them to the Morningside Center in the Chinese Academy of Sciences, they would come. The same holds for the Mathematical Sciences Center of Tsinghua University. They are, of course, there as well. In fact, in the past several years, their enthusiasm simply grows!

In the past five years, we have enjoyed the vision and forceful support of several administrations of Tsinghua University. With the strong support of the successive party secretaries of Tsinghua, Chen Xi, Hu Heping and Chen Xu; and of the successive presidents of Tsinghua, Gu Binglin and Chen Jining, we have successfully attracted a good number of world-class mathematicians. For example, when the Center was in its infancy, Professor Ben Andrews of Australia joined the Center. He is a world-class mathematician in geometric analysis. The second senior addition is Prof. Eduard Looijenga of the Netherlands. He is an outstanding mathematician in algebraic geometry who joined our Center as a full-time and permanent professor a couple of years ago. Recently, Thomas Farrell and John Erik Fornæss, highly regarded and successful professors from the United States, have joined our Center as full-time and permanent faculty. Professor Farrell is attending the ceremony today, though Professor Fornæss is unable to attend. I am happy to see all of these accomplished scholars coming to work at our Center.

Besides research, the most important mission of this Center is to train a large number of young mathematicians. Therefore, we must also recruit a group of young professors to help. Our recruitment drives for senior professors and for younger colleagues have been proceeding concurrently. We are pleased to see that we have achieved an appropriate level of success. For instance, we recruited Professor Yu Pin when our Center was less than one year old. He was a new PhD at that time. I am very glad that he was recently promoted to be a tenured colleague. Professor Huihui Zeng has recently followed in Professor Yu Pin's footsteps. I am also glad to see that my former student, Prof. Si Li, has joined the Center. These young mathematicians have done first-rate research. We are very proud of them.

Meanwhile, we are also very pleased to receive help from our old friends in the mathematical community around the world. Despite their constraints, they are willing to spend three months each year to teach in our Center and to mentor our junior members. Some of them are simply too busy to meet even when I stay abroad. For example, Prof. Spencer Bloch, who spoke just now, and Prof. Leon Simon, who is in the audience here, have visited our Center several times. Every time they come, they teach a class. It's extremely helpful for our young scholars and for the overall development of our Center. To summarize, we are delighted to declare that we have achieved initial success.

However, our goal for this Center is to be one of the first-class research and education centers in the world. Although we do not expect to catch up with Harvard University, Princeton University, the University of Chicago, or Stanford University, in a short time, we do aim to make great strides and to compete at an international level in five or six years. Our goal, in the short term, is to be considered among the top twenty departments or centers in the world. We want to produce a large number of leading young scholars. It is true that, over the past decade, lots of Chinese undergraduate students have reached a first-rate level, but most of them have gone abroad to do so. Recently, we saw a fraction of these outstanding students return to China. However, the ultimate goal, in the development of China's talent pool, is to produce first-rate graduate students on Chinese soil. That is one of our most important goals. Nowadays, China produces excellent PhD students, but too few of them.

I hope that, over the next five years, we can produce a great number of world-class PhD students, so that frontiers of research can be met within China itself. That would be a critical indicator of our success! I wish to see the graduation of the first large cohort of high-quality students within five years of today, and I look forward to the day when those talents—homegrown in China—might achieve work at the level of Fields Medal—perhaps within a decade or so. I've talked with a lot of friends about how to train such local talents to improve our Center. Although the Fields Medal is not the ultimate target of such research, it is, after all, an important benchmark, and it is still the wish of most young mathematicians. I think we should continue to communicate and work closely with foreign and domestic scholars, with the support of national and Tsinghua leadership. With that support, we'll have the chance to accomplish our goal of nurturing great talents and to look forward to the birth of Fields Medal winners at Tsinghua, or at the Chinese Academy of Sciences, or at other places of China—within the next ten years. I personally do not believe that we could declare success if we succeed only in one or two places. I hope that the entire nation's level of mathematics research will rise, and I trust that most people share my aspirations.

We are very grateful, not only for the devotion of the academic community, but for the support of the central government, local governments, and the business communities. For example, with the support of the Hainan Provincial Party Committee,

Sanya City offered 140 acres of land for us to build a mathematics conference center. The Tsinghua Sanya International Mathematics Forum is the first mathematical conference venue of its kind in Asia. Thanks to Mr. Weixue Shi's donation, there are now graceful buildings in which the Forum can serve mathematicians. Last year, more than one thousand mathematicians participated in various workshops at the Sanya Forum. We hope to sustain the Sanya Forum so that it will eventually become a venue for mathematicians from all over the world. In the Sanya Forum this year, we have already planned many large-scale international events. Thus, the Center will expand its impact on our friends and students in the mathematical community. And it will be an international hub for mathematical interaction.

As Prof. Spencer Bloch mentioned a few minutes ago, our Center should be not only a Chinese mathematical center, but also an international center. I think such a broad approach is both appropriate and necessary. Mathematics observes no national boundary. If we merely think of Tsinghua University, or the Chinese Academy of Sciences, or even of China as a whole, we are being shortsighted. China can perform remarkable research that other countries cannot—and vice versa. So we must communicate with each other, and learn from each other's achievements. Only in this way will we be able to make breakthroughs and succeed. Over the years, our faculty members have been invited to visit a lot of first-rate universities. The Yau Mathematical Sciences Center has established formal relations with many leading math centers in the United States and Europe, so that we can develop mathematics together. For instance, the mathematics center of Harvard University will invite a dozen Chinese scholars to participate in their research for three months next year. Among these scholars, about six of them are professors at Tsinghua. And on the other hand, many Harvard professors have come to participate in various activities at our Center here. I am happy that these activities are extremely helpful for our young people.

I should like to express my sincere gratitude to our foreign friends. China is a huge country of 1.4 billion people. It is very significant to mathematics. Just imagine, how much would be the influence of 0.01% of 1.4 billion people becoming mathematicians? I think that our overseas colleagues understand this well. Many masters, including the great foreign scholars here, have a lot of excellent Chinese PhD students. Some of them are present today. Two years ago, we gave an honorary award to Prof. Stanley Osher in recognition of his contributions to the Chinese mathematical community. He has mentored a number of Chinese applied mathematicians, all of whom have served the Chinese mathematical community. Since the beginning of the twentieth century, foreign mathematicians have had a profound impact on Chinese mathematics. We hope their efforts will continue. To speak historically: In early years of the last century, the German mathematical community trained Shiing-Shen Chern (陳省身) and Wei-Liang Chow (周煒良), great geometers and algebraic geometers. In the United Kingdom, the University of Cambridge had trained Loo-Keng Hua (華羅庚) and Pao-Lu Hsu (許寶騄), two masters of our own mathematical community. And when Sino-Japanese relations were in their worst period, Japan nevertheless trained a large number of our early Chinese mathematicians, including Jian-Gong Chen (陳建功) and Bu-Qing Su (蘇步青). Although these predecessors of ours have since passed away, their impact on Chinese mathematics is long-lasting. In Russia, a large number of applied mathematicians were trained in the years after 1949. Nowadays, Russian applied mathematics still has a significant influence in China. As for the United States, we can say without exaggeration that their contribution is of epoch-making significance. For more than a hundred years, from the time when the Tsinghua School was sending students to study in the United States, to the present day, countless Chinese mathematicians had been trained by American universities. Mrs. Shiing-Shen Chern's father, Prof. Zheng Zhifan (鄭之蕃), graduated in the United States and became the first dean of the mathematics department at Tsinghua University. So, Tsinghua itself has been greatly affected by scholars returned from America. There is no doubt that the US will continue to affect Chinese mathematics—and we are willing to see continuous exchanges between the two countries.

I would say to our mathematician friends: Please remember to be broad-minded, and don't just look at the achievements of Chinese mathematics. Indeed, we should develop mathematical sciences here, but treat it as something that belongs to the world, instead of just to China. Some countries believe that good mathematics must be written in their own languages, but I think we have to abandon such a narrow perspective. As we know, the greatest dynasties in Chinese history, either Han or Tang, were open cultures. There was a fair amount of exchange and collaboration with overseas scholars in many countries at that time. Chang'an was the most important place due to its openness. Today, I hope that either Tsinghua University, or Zhong Guan Cun in Beijing, will become the world-class place for exchanges with overseas scholars, and I expect Chinese scholars to be able to train first-rate mathematicians. I fondly wish that the Center should fulfill its purpose—educating a large number of excellent young mathematicians, and carrying our activities and dreams forward.

Thank you!