季理真教授访谈录

　　季理真教授是一位知名的华人数学家，师从丘成桐教授，从1995年至今任教于美国密歇根大学数学系，从2002年起兼任浙江大学数学科学研究中心高级教授，其主要研究领域是几何、拓扑及数论这些主流数学的交叉学科。他在局部对称空间的紧化、黎曼面的谱、迹公式等方面取得了一些原始创新成就，解决了Borel猜想、Siegel猜想等几个长期悬而未决的猜想，还对Novikov猜想等几个猜想作出了重要贡献。

　　2011年六月中旬，季理真教授将访问卡尔斯鲁厄理工学院（KIT）和德国、法国的其他几所高校和数学研究所。数学学会有幸联系到季理真教授，请他回答了我们留德华人学子在学习和科研中切实面临和关心的一些问题。季理真教授认真回答了我们的问题，在征得他的同意之后，数学学会整理和发布这些问题，希望对广大有志于搞科研的朋友、特别是留德学生学者能有所帮助和启发。

（1）您认为对一个数学家，特别是纯数学家而言，哪些素质显得尤为重要？

Ji：Curiosity and love for the subject.

（2）您曾说过，作数学不仅需要智慧，更需要坚持，要有追女孩子的韧劲，终身不离不弃。那么您认为这两个因素，智慧与坚持，它们大概各占多大的比重呢？

Ji：Persistence is certainly important. Each person is talented in his or her own ways. The famous Edison said "Genius is one percent inspiration, ninety-nine percent perspiration." Maybe the same percentage applies to persistence and talent.

（3）在数学研究中我们有时会碰到一些关键的命题，根据直观的猜测，这些命题应该是成立的，但是我们却一直无法用数学方法严格加以证明。您是否碰到过这种研究中的瓶颈，您是如何对待它们的？

Ji：Yes, it happens all the time. A famous mathematician Peter Sarnak at Princeton Univ said that the common state of a mathematician is being stuck. One way out of this is to consider/view the problems from different perspectives and also work on a variety of problems. We need persistence but should be flexible in some ways. For most problems, solutions will come eventually, though maybe from different sources.

（4）您曾说自己曾经得到过的最重要、最深刻的忠告是博士毕业时丘成桐说的：
"Nothing is as easy as you think, but is not as difficult as you fear either"。 您能否结合您的经历具体谈谈您现在对这句话的理解和感悟吗？

Ji：This happens also with every math problem. It looked very difficult at the beginning, but once it is solved and looking back, it is simple. One often wonders how come I did not think of this before. Sometime we feel that we understood something already, actually we don't fully understand. The same thing with writing up papers. We know the answers are simple and it should be easy to write up papers. But it takes a lot of efforts to write up good papers.

Ji：Yes, I will choose math again. We have the freedom to choose what we want to study and to explore an ever new world. It might be difficult and challenging, but always interesting and attractive.

（6）您是位卓越的数学家，您的夫人是哈佛大学数学博士，您的孩子也准备将来做数学吗？您和您夫人在日常生活中也会谈论一些数学方面的话题吗？

Ji：Yes, my children are interested in math too. We do talk about math and math books.

（7）您认为什么样的数学算是美的数学？您认为数学之美除了在于发现还在于哪些方面？

Ji：It is difficult to answer. The beauty lies in the eye of beholder. On the other hand, math that connects different, unexpected subjects and gives simple solutions to complicated problems is beautiful. The concise, precise, powerful ways to describe complex relations and phenomenons is another beautiful aspect of math. For example, think
of the formula $e = m c2$ by Einstein.

（8）现实生活中并非象纯数学那样处处充满和谐与美丽，而作为一个天天和具有高度美感的纯数学打交道的人，您又是怎样看待和追求生活之美的呢？会不会有时因为现实生活里并没有数学里那种理想化的美，而更多的是一些琐屑的程式化的东西而感到失望呢？

Ji：No, life is to live. All these things make life rich and interesting.

（9）您和许多世界著名数学家都有过交往与合作。那么他们之中谁给您留下了最为深刻的印象？您认为谁对您学术上的影响最大？

Ji：There are many, and they have different impacts, for example, my advisor Shing-Tung Yau and my collaborator Armand Borel.

（10）您曾谈到过做数学的感觉问题。能具体给我们说说这个感觉吗？

Ji：Intuition, imagination and feel are important. The famous Hilbert wrote a famous book "Geometry and Imagination"

（11）您曾说过，数学很有意思，而每个数学家都有自己的特点。比如拿过菲尔茨奖和沃尔夫奖的Margulis呢，反应不是特别快，但是他考虑得很深。那么您认为您自己是那种类型的数学家呢？

Ji：I don't know much about anything. But I am sure that I am not at such a level to be classified.

（12）最后请您送给广大旅居德国，有志致力数学研究的中国学子一句话。

Ji：The math road might not be straight or smooth but it is beautiful and fun/cool. Enjoy it!

中国留德学人数学与应用数学学会
（http://www.gcma-ev.de）

2011年6月8日