



International Cooperation and Education is Key to Chinese Astronomy

—An Interview with Prof. Robert Williams

Q: What is your assessment of this IAU General Assembly?

Prof. Williams: From my standpoint, it has gone extremely well. The quality of the talks that I heard was quite high. We were successful in attracting Vice President XI Jinping of China to the Opening Ceremony to give an address that affirmed his solid support for science and especially astronomy. I believe the NAOC and LOC have done superb work in arranging so many details. All of the Chinese representatives have been very gracious and understanding. I have been impressed how such a complex event like this can go so smoothly. I give my heartiest congratulations to the Chinese organizers.

Q: What are the most important changes that have been made in the IAU for promoting global development and collaborations in astronomy?

Prof. Williams: I think a key change for the IAU is that we are moving from an organization that historically has been largely internally focused on the professional development of astronomy to one that is more outward looking and committed to using astronomy as a tool for development in emerging nations. As part of this we are becoming a more operational organization and increasing our programs in education and outreach. Much of this has been followed up from the International Year of Astronomy 2009.

We are also about to start more serious involvement of the IAU in helping facilitate collaborations on large



Outgoing President of IAU Prof. Robert Williams.

international projects. Large projects are expensive and it is difficult for individual governments to provide for their full funding. Therefore, for large forefront projects it is realistic to think we must encourage international collaboration. The IAU has not played a large role in this before so we have formed a working group that reports to the Executive Committee called the “Large Scale Facilities Working Group”. Large project involvement clearly benefits astronomers whereas the Office of Astronomy for Development in Cape Town is directed more outside



Chinese Vice President Xi Jinping (left) and Robert Williams during the opening ceremony for the 28th General Assembly of IAU in Beijing, August 21, 2012. (Xinhua/Liu Weibing)

the professional astronomy community. It is healthy for the IAU to maintain emphasis on both communities, i.e., professional astronomy and society as a whole.

Q: Can you comment on some of the more outstanding and important discoveries and advances in astronomy?

Prof. Williams: Astronomy continues to produce many exciting discoveries. We are beginning to characterize exoplanets. We have now identified approximately 800 known planets, with the number increasing every week. Soon I am sure we will find good examples of habitable planets that are earth-like. We have methods of characterizing their atmospheres with both ground facilities and space missions that are being proposed. We have the opportunity to look for biomarkers, i.e., the spectroscopic signatures that indicate life may be present, such as ozone. This is ground breaking science.

The understanding of different aspects of dark energy and the distribution of dark matter are also advancing. We do not understand dark matter yet, but we are constraining dark matter and dark energy more and more. In terms of significant discoveries, I would include WMAP's standard cosmological model as being very important. I would also say that the continuing studies of the activity in the center

of the Milky Way associated with the supermassive central black hole have been very interesting. Those examples – the Galaxy's supermassive black hole, dark matter and dark energy, the standard cosmological model, and exoplanets – are only a few examples of the significant advances in astronomy that we have heard about in the past two weeks. In terms of theory, numerical modeling has been very important in contributing to the understanding of a variety of phenomena, from the collapse of clouds that lead to star formation to accretion and jet outflows, and especially to the formation of structure from the early universe quantum fluctuations.

Q: You have had good communication with the Chinese astronomical community. Can I ask for your expectations for Chinese colleagues?

Prof. Williams: The development of astronomy in China for the past 15 to 20 years has been remarkable. You are now competitive at the international level in ground-based facilities. In space, although the space missions are yet to be launched, China is 'on track'. China is now at the point where it can legitimately seek international collaboration on important projects and be able to offer capabilities that other countries can use. For me, internationalization is the key to success in significant scientific endeavors. My advice to Chinese astronomers would be to learn from the experience of countries with well-developed astrophysics programs and focus on the broad education of astronomy students, including offering them the opportunity to study abroad. Commit yourself to attracting many of the best of them back to China to help develop your infrastructure. Educating students with international experience and participating in the most advanced international facilities, both ground- and space-based, should be a future emphasis for Chinese astronomy.

(This is an interview between the outgoing IAU President Robert Williams and WANG Jingxiu, a research professor with the National Astronomical Observatories, Chinese Academy of Sciences and Editor of *Inquiries of Heaven* during the 28th IAU General Assembly in Beijing in August, 2012. The interview was originally published in the 10th issue of *Inquiries of Heaven*. The title is added by BCAS editors, who also made minor changes in the order of questions and wording of the article.)