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Promoting Transdisciplinary and Transcultural Cooperation in Space Science in Face of COVID-19

– Interview with Prof. Wing-Huen Ip, Executive Director of ISSI-BJ

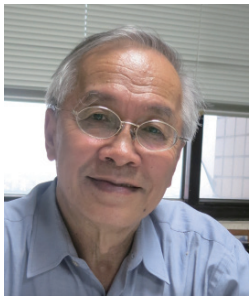

Image by courtesy of Prof. Ip

Prof. Wing-Huen Ip

Executive Director of the International Space Science Institute – Beijing
Planetologist, Member of the International Academy of Astronautics & American Geophysical Union

Recipient of the Exceptional Public Service Medal of NASA (2009) for contributions to the Cassini-Huygens mission to Titan and Saturn

Prof. Wing-Huen Ip, a world-renown scientist in cometary physics, planetary science, solar system evolution and exoplanets, took the post of the Executive Director of the International Space Science Institute – Beijing (ISSI-BJ) in June. As the only partner of the well-known International Space Science Institute (ISSI) in Bern outside Switzerland, ISSI-BJ has adopted the same tools as ISSI to facilitate international cooperation and academic exchanges: workshops, forums, and others that rely on in-person communications. At a time when the COVID-19 pandemic has forced the science community to move many activities online, how will he and his colleagues secure the progress of academic exchanges across disciplines and cultures? At the invitation of staff reporter SONG Jianlan, he shares his thoughts with the readership of *BCAS*.

BCAS: *We are glad to know that you assumed the office of the Executive Director of the International Space Science Institute - Beijing (ISSI-BJ) in June. Congratulations! When taking up this post, you are also taking the enormous challenges posed by the fast-changing situation. We are eager to know what you will do during your office term to strengthen ISSI-BJ's role as a neutral and science-only platform in promoting space science research across disciplines and cultures? What will be the first thing(s) you do and the most important agenda set for your office term?*

The most important thing is, of course, to take advantage of ISSI-BJ's neutrality and 'science-only' approach to produce a scientific program of the highest standard and value possible and to better benefit the international space science community. In this sense, two aspects should be considered. The first one depends on the successful participation of the most outstanding and forward-looking scientists in the discussion on novel scientific mission concepts. Moon-based science laboratories and space observatories for the search of extraterrestrial life fall in this category. On the other hand, we should not lose sight of the most pressing problems of our time that space science and technology could help solve. In this regard, the first thing that comes to my mind is the challenge posed to human kind by climate change. Therefore, one of my goals is to strengthen the Earth observation research activities carried out at ISSI-BJ. As a result, the promotion of regional cooperation and the active participation of the Asian space community should be a must since the consequences of climate change will hit Asia hardest in the coming decades. This way, ISSI-BJ will hopefully be able to play a key role in helping space science research reach new heights across disciplines and cultures.

BCAS: *As mentioned in your message to the public released on the website of ISSI-BJ, the institute is adjusting its development strategy to the current situation, as an effort to cope with the "new reality" and new challenges never imagined before. What are you and your colleagues doing to adapt to the new situation? Would you give some details?*

Since we don't still know when this dreadful COVID-19 pandemic will come to an end, several of our in-person meetings have been put on hold and/or postponed to 2021 and 2022, which will make our coming post-COVID-19 period a hustle and bustle. Therefore, we are devising new counter-measures to cope with this period of stalemate. One of such activities is the new online seminar series titled "On Things to Come". As opposed to – yet inspired by – the "Game Changer(s)" seminar series run by ISSI in Bern, our "On Things to Come" puts emphasis on the introduction of ongoing or new space missions in astronomy and planetary science. The invited speakers are all outstanding scientists involved in space missions of different space agencies. Thanks to the format of these seminars, we are confident that these ISSI-BJ lectures will reach a much wider audience than face-to-face meetings, thus broadening the appeal of space science research.

BCAS: *Will this adjustment change ISSI-BJ's traditional organizing tools to facilitate international cooperation, for example workshops, forums, working groups, international teams and visiting scientist programs, which seem to rely on in-person communication between people from different regions and countries? As we know, "international" is in the genes of ISSI-BJ just as in its name. At this difficult time with restrictions on international travels lingering and uncertainties hanging, how will you keep scientific communities from Asia and Western countries closely connected, to promote interdisciplinary and intercultural exchanges in space science?*

You are perfectly right in saying that high-quality activities, such as workshops, working groups, forums, and international teams, are the trademark of ISSI-BJ. This was recently corroborated by our teams' decision to not replace their face-to-face meetings with online ones, as they'd rather wait for the pandemic to be over and be able to come to ISSI-BJ. This must be because they value very much the experience of in-person discussion and scientific exchange. On the other hand, in order to incubate new teams focusing on recently emerging topics or some targeted areas, we are currently planning to invite proposals for topical webinars under the assumption that some of them may evolve into full-fledged in-person meeting proposals in the future. A main evaluation criterion will still be the international character of the teams, one of ISSI-BJ priorities.

BCAS: *We are happy to see that ISSI-BJ is*

resuming its signature activities, including forums to allow in-person discussions and better brain-storming. We noticed that seven new international teams elected in 2020 were released in June, and the dates for a forum on detecting missing baryons in the universe recently settled on the schedule of ISSI-BJ, after having stayed "to be decided" for a long time. Will all the delayed events and activities resume? What are the most important events to be anticipated during this period of time?

As mentioned above, the organization of international teams has slowed down under the current situation due to travel restrictions and health issues. Nonetheless, our staff is always in contact with the team leaders to be always up-to-date about their status. Furthermore, although we feel that it is up to our teams to make a move and reschedule their meetings according to their needs and commitments, we are always interested in keeping the conversation about their upcoming face-to-face meetings going to make sure they will happen at the earliest time possible. As far as we can see, the resumption of normal operations (in the old fashion or differently) at ISSI-BJ will depend on the successful curtailing of the global impact of the Novel Coronavirus. Let us be optimistic that this will happen soon.

BCAS: *We noticed that ISSI-BJ has arranged the ISSI-BJ/APSCO Space Science School on "Analysis and Investigation of Scientific Moon Data". Would you give more detail of this event? Will it still happen this year? Does it have anything to do with data collected by the Chang'e missions?*

ISSI-BJ and APSCO have established an excellent cooperation model. The two Space Science Schools (SSS) held in 2016 in Thailand and in 2018 in Hainan, China, are exemplary in terms of educational value and capacity building of international cooperation. The third SSS on "Analysis and Investigation of Scientific Moon Data" was meant to take place in 2020 in Macau. Unfortunately, the plan was disrupted by COVID-19. Along with the improvement of the current situation, we are now ready to catch again the threads of our SSS with APSCO and the host institution. Realistically speaking, the third ISSI-BJ/APSCO SSS will likely take place sometime in 2021. Related to this is also a new ISSI-BJ project for the establishment of a parallel Space Science School program in cooperation with the university consortium for space research in the Greater Bay Area. If successful, this new initiative could inject new energy and vitality in the education and training of a new generation of space scientists with a flexible world-view and international perspective.

BCAS: *China has just launched "Tianwen-1", the first mission of its Mars Exploration Program. As a world-renowned planetologist, what are you expecting from this mission? For you, what would be the most interesting or attractive part of the mission? How will the data and materials collected by this probe contribute to Mars research, planetary science and the broader space science?*

The planning and launch of the "*Tianwen*-1" mission to Mars with landing and rover scientific operation represent an admirable achievement for the space engineers and scientists in China. We believe that it will greatly boost the confidence and interest in space exploration not just of the scientific community but also of the general public. It is the job of ISSI-BJ to integrate the vast amount of scientific knowledge and experiences obtained by "*Tianwen*-1" in the international context. The well-known African proverb "If you want to go fast, go alone. If you want to go far, go together" perfectly applies to the state of scientific research and space missions. Now that we are going to explore another planet that will have an immense impact on the future of the human society and civilization, we must embark on this journey together. The fact that China has joined NASA and UAE in this round of Mars exploration considerably fosters the spirit of international cooperation.

BCAS: *Would you share with us your opinions/comments on the scientific objectives of the whole Mars Exploration Program of China? To what extent do you think this program will help the research in this field?*

This is a tall order to answer. I believe that the Mars Exploration Program (or any deep-space exploration program) must be evaluated in the framework of a global roadmap so that the scientific investments as well as benefits to our society will be more cost-effective. After "*Tianwen*-1", the next Mars mission of China National Space Administration will be a sample-return

mission. This is a game changer in many ways. What will result from this is anyone's guess since there are so many things to explore on Mars. It is possible that the driving force for the next step of in-depth Mars studies will come from the discoveries of "*Tianwen*-1" or "*Tianwen*-2" and other missions. What is of some concern at the present time is probably the long pause between two consecutive flagship-like missions, even though many comment on China's rapid advancement in space exploration considering the lunar program and its additional space activities. It would actually be desirable to mount some small-scale planetary missions at lower costs (and hence lower risks), so that the scientific community will always be in the position of yielding and analyzing new data. Such strategy would also add flexibility and a high level of international cooperation to the fast-turning planning cycle, while maximizing scientific returns. We note here that the Indian Space Research Organization has proved how we can take full advantage of a science-based approach, as exemplified by its "Mangalyaan" mission to Mars as well as its upcoming Venus mission. In the same vein, JAXA is second to none in sample-return missions to asteroids (and now the Martian moon, Phobos). It would be wonderful if we could have joint missions by pooling resources together in future.

BCAS: *Does ISSI-BJ and ISSI/ISSI-BJ Science Committee play any role in formulating the scientific objectives of the Mars Exploration Program of China? Is the institute running any project/event in relation to the Program?*

The fact that ISSI-BJ and ISSI in Bern share the same Science Committee (SC) is essential for the excellence of the programs of both organizations, even though they operate independently. The SC reviews the proposals of International Teams, Forums, Workshops, Working Groups, and other related items so that the corresponding scientific outcomes can be of the highest quality possible. The main purpose of these meetings is to provide a much-needed platform and intellectual environment to allow leading experts of specific topics to sit together to exchange ideas and insights on the scientific data yielded from previous (or ongoing) missions and to carry out brainstorming sessions on future possibilities. From this point of view, ISSI-BJ and the ISSI/ISSI-BJ SC will certainly play an important role in the planning of China's future Mars missions as well as of other countries. Indeed, ISSI-BJ is very lucky to have the opportunity to serve as the breeding ground of many exciting space missions, may they be in the fields of astronomy, planetary science, space physics, or Earth observations. The continuous support granted by the Chinese Academy of Sciences and other national and international institutions will be most essential in this endeavor.

BCAS: *Thank you so much for your beautiful answers. Look forward to meeting scientists from both Asian and Western countries at ISSI-BJ.*