Introductory remarks

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The Asia-Pacific region is the region of the world where solar physics is growing at the fastest rate at the present time. The papers in this very special Section of our Proceedings volume will constitute a unique document of great historical value surveying the growth of solar physics in our region. Takashi Sakurai first suggested to me that there should be some session in APSPM focusing on historical development of solar physics in this region. We had an evening session in which Professors Cheng Fang, Eijiro Hiei and Siraj Hasan spoke on solar physics respectively in China, Japan and India — the three countries in the Asia-Pacific region having the largest solar physics communities. Jingxiu Wang chaired this session. This evening session was highly appreciated and several persons told me that there should have been talks on solar physics in the other Asia-Pacific countries as well. The day before the end of the conference, I asked Leonid Kitchatinov, Kyung-Sok Cho, Michael Wheatland and Chia-Hsien Lin if they could make brief presentations on solar physics in Siberian Russia, Korea, Australia and Taiwan in the concluding session next day! They all accepted the challenge, must have made their preparations around midnight after the conference banquet and made excellent presentations next day. We regret that we could not obtain a paper on solar physics in Siberian Russia in this Section, but the papers by Kitchatinov and Demidov in this Proceedings volume will give some idea of the outstanding research being done in Siberian Russia. Although we did not have any participants from Uzbekistan in APSPM, I am happy that colleagues from the Ulugh Beg Astronomical Institute have contributed a paper on their solar physics activities.

During the middle ages before the European Renaissance, the Asia-Pacific region and the Islamic civilization stretching from the Central Asia to Spain were the most advanced centres of science. Joseph Needham, the great Cambridge scholar who studied the history of science in China, wondered why the scientific revolution took place in Europe rather than in China or India — a question since then known as the *Needham question* to historians of science. However, after the Renaissance, Europeans quickly outpaced the rest of the world in science and, only from the beginning of the twentieth century, there have been serious efforts in the Asia-Pacific region to catch up.

Solar physicists of my generation working in the Asia-Pacific region have the great personal satisfaction of witnessing an extraordinary blossoming of solar physics

in our region within our professional careers. When I was a graduate student of Gene Parker at University of Chicago in the early 1980s, there was very little solar physics research done in the Asia-Pacific region. I knew that Japan had a great tradition of solar research and seminal contributions to solar physics were made by Unno, Uchida and others. I also read the classic monograph *Sunspots* by Bray and Loughhead, who worked in Australia. But, as a graduate student, I did not hear much of solar research done in the rest of the Asia-Pacific region. China was just coming out of the *Cultural Revolution* at that time. In India I knew that Kumar Chitre was initiating research in theoretical solar physics and a solar observatory was established in Udaipur. I was thrilled when Gene came to my room one day, put down a couple of papers on my desk and said: "Somebody in your country has written very interesting papers on convective collapse. You must read these papers." The author's name was S.S. Hasan. That was the first time I came across this name.

When I was growing up, India was a desperately poor country, but we had an enormous respect for our first two Prime Ministers — Jawaharlal Nehru and Lal Bahadur Shastri — which educated Indians never had for any of their successors. Mahatma Gandhi was my childhood hero and I grew up with the idealism that we have to build up our newly independent nation. When I was working in USA, I was continuously bothered by the question whether I would be able to get a suitable job in India (academic jobs were few and far between in India in those days) that would enable me to carry on my research. I was a postdoctoral fellow in High Altitude Observatory when I was offered a lecturer's position in the newly-formed astrophysics group in Indian Institute of Science. On the day I was going to post my acceptance letter (those were the days before e-mail), I met BC Low in the corridor and told him about my decision. BC is from Singapore and did his PhD with Gene Parker a few years before me. BC took me to his office, told me various things about his experience with Singapore and then said strongly: "Things are going well with you in USA. Surely Gene Parker will help you in getting a good job. We shall all help you. You should give up this crazy idea of going back to India at less than one-tenth of the salary you are getting here. If you go back to India, that will be the end of your scientific career." Since I always look up to BC like my elder brother and I knew that he was my genuine well-wisher, I was very disturbed by this conversation. I returned to my office and started thinking what to do. Then I decided to telephone Gene Parker and told him about my conversation with BC. Gene listened to me patiently and then asked: "Do you really — I mean *really* — want to return to India?" I said that I had the dream of building up a research group in India, but I was totally unsure if I had the intellectual capability of thinking up good research problems completely on my own in an isolated place. I was only 30 and had limited research experience. After I explained everything, there was a silence on the telephone line. I wondered if Gene was still there at the other end. Then I heard Gene utter three short sentences slowly and clearly — three sentences which determined the course of my life and which still ring in my ears: "Arnab, we each have only one life to live. Go, chase your dream. I have confidence in you." I thanked Gene, put down the telephone and posted my acceptance letter.

After I returned to India, I found the research facilities and conditions so inadequate that for a year I was sure that BC's prediction would come true. The only redeeming feature was that I was in a physics department with extremely brilliant colleagues and students. After my first PhD student Sydney D'Silva started working me, things looked a little brighter. There was a long 8-year period when I never attended a conference outside India because there was no travel fund. One could still work without attending an international conference, but one needed a computer to do the things I wanted to do. I had no funds even to buy a good PC. The condensed matter theory group in our department had a Vax computer and I asked them if I could use their computer. In those days computers were not inter-linked. To use a computer, one had to physically sit in front of one of the 4 or 5 terminals kept next to the computer in the 'computer room'. The condensed matter colleagues were very sympathetic, but they also had limited facilities and their terminals were always occupied by their students during office hours. They told me that my students could use their computer after 10 p.m. at night. Luckily Sydney was a night bird. He would come to work in the computer room after 10 p.m., work till the wee hours in the morning and go to bed when light appeared in the eastern sky. I rarely saw him during the office hours. Working this way, he succeeded in coming up with the first theoretical model of Joy's law which was discovered by Joy three-quarters of a century earlier and till that time lacked a quantitative theoretical explanation.

The papers in this Section tell the readers what research was done in solar physics in different Asia-Pacific countries when solar research got initiated. But they do not tell the human stories of the persons who initiated that research. That is why I have taken the liberty of recounting my story here for the younger generation who may not be aware how we did our research in those years. I believe that my story is by no means unique and many other pioneers of solar research in the different Asia-Pacific countries can tell similar stories. Especially many of my Chinese friends who had their formative years disrupted by the *Cultural Revolution* can tell stories much richer in human drama than my story. I had the good fortune of knowing some of the pioneers of solar research in the Asia-Pacific region from the very beginnings of their scientific careers. Dean Chou, who initiated solar research in Taiwan, did his PhD with Hal Zirin in Caltech at exactly the same time when I did my PhD with Gene Parker in Chicago. We got to know each other in USA and became good friends, although we have met only twice after that! In a pedagogical workshop on solar physics in Crieff (Scotland) in 1991, I met two very young and charming Korean boys: Jongchul Chae and Yong-Jae Moon. They had started working for their PhD in Korea and that was their first trip outside their country. Although their English communication skills were severely limited at that time and our conversations could not go very deep, we became friends. I had also met a young Kazunari Shibata in High Altitude Observatory (during what was probably his first trip to USA) when his English was far from fluent. But my scientific discussion with him was almost a turning point in my career. Discussing with him, I got the idea how to tackle a scientific problem in which I was unable to make any headway for weeks. This led to some of my best works.

As economic prosperity came to our region in the last few decades and sizes of solar physics communities in different Asia-Pacific countries grew, younger people working in our region no longer face the hurdles which people of our generation faced. Since Western Europe and North America had a historical advantage over us, many of us in our region have always looked towards those regions for appreciation, collaboration, visiting positions, etc. But, if we want to compete with those regions, we must have more scientific interactions amongst the solar physics communities of the Asia-Pacific. Although I felt this way for many years, I personally did not do anything till 2004 when I was attending an IAU Symposium in St. Petersburg and had prolonged discussions with a kindred soul: Jingxiu Wang. Both Jingxiu and I were staying in the Pulkovo Observatory guest rooms which, as the organizers had warned us, were in very dilapidated condition, but we were both travelling on a shoestring budget and could not afford the hotels. That was the time of white nights in Russia, when the sky became dark only for a short while around the midnight. After the conference in the city centre, Jingxiu and I would return to our rooms in the evening in very crowded subway trains and often chatted about various things during the long twilight hours. Jingxiu and I planned that we should organize some meetings to bring together the Chinese and Indian solar physics communities, and then these meetings would be broadened to cover the entire Asia-Pacific region in future. We also dreamt of having an astrophysics journal, managed by astrophysicists of our region, which may one day compete with ApJ, A&A and MNRAS. We knew that some other persons like the eminent Korean astrophysicist Hyung Mok Lee were also passionately arguing for this. Some of the things we thought up in 2004 had become realities by now. We now have the journal *Research in Astronomy and Astrophysics* (RAA), but it is still very, very far from becoming a serious competitor of the world's leading astrophysics journals. That can only happen if astrophysicists from our region send some of their best papers to RAA.

I am optimistic that the younger generation of solar physicists in different Asia-Pacific countries will achieve much more than what our generation had achieved. The papers in this Section may give them a good idea of their shared inheritance on which they have to build up.