

Research as a Foreign Scientist in Japan

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Abstract

I have been a fellow of the JSPS at KEK for 2 years. This fellowship has given me the opportunity to see how research is conducted in a Japanese research institute and to compare with my experience in Europe. My stay in Japan has also been an opportunity for me to discover a different culture.

1. Japan seen from Europe

In January 2002 when I started to look for a post-doc, I knew very little of Japan. For my PhD I was often traveling to DESY and thus I was interested in the Linear Collider projects but, to widen my horizons, I wanted to work in another laboratory than DESY. The numerous hassles imposed to foreign researchers in the United States made that I wanted first to look for a post-doc elsewhere.

When I learned about the Linear Collider activities conducted in Japan and about the fellowship opportunities offered by the Japanese Society for the Promotion of Science (JSPS), I decided to apply.

Japan is far from Europe and travels to Japan are expensive, thus I knew very little about Japan and about the Japanese people, mostly stereotypes: a country where many martial arts were born and one of the technologically most advanced countries in the world.

About Japanese research in accelerator-based physics, I knew that KEK's website was the best place to find an old preprint even if it was not available anywhere else. I had never worked directly with Japanese researchers but my thesis was based on theoretical predictions done at KEK by professor Hagiwara (on excited fermions production) and while I was working on H1 similar analyses were done by a Japanese group on ZEUS. So I already knew that Japan was involved in top class research.

2. Research in a Japanese institute

One of the most striking difference between Japanese and European institutes is the number of sub-contractors. In the canteen of KEK you can often see large teams of workers from sub-contractors like Toshiba or Hitachi. These teams are strongly involved in the work done at KEK and the collaboration between KEK's researcher and external companies starts at a very early stage of a project.

In Europe High Energy physics labs often have a big workshop staffed with technicians and engineers. The early design of any prototype will be done in this workshop and only once a working prototype has been built and fully tested the mass production will be outsourced to an external company. For example the prototypes of accelerating cavities and klystrons for the Linear Collider in Europe or America are mostly built in the workshop of the laboratories. Similar prototypes developed in Japan are built by external companies (Toshiba, . . .). This means that those companies often come on-site to discuss the design of the prototypes they are working on. Once a device has been built the external company will also do its maintenance.

As external companies are strongly intertwined with the daily operation of Japanese research centers the knowledge flows much more easily from research to industry in Japan than in Europe. The drawback of this system is that Japanese laboratories have almost no technical staff to provide technical support. As I

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was not familiar with radio-frequency (RF) electronics when I started my fellowship at KEK, I would have liked to be able to work closely with a RF engineer during the first stage of my project to learn from him. As most of the technical staff is outsourced this kind of close collaboration was not possible.

A group like the “Linear Collider Forum of Japan” in which 64 industrial companies (including big names like Hitachi, Toshiba, ...) gather to petition the government in favor of a fundamental science equipment is something that would be hard to imagine in a country where scientific research and industry are not as much intertwined as they are in Japan.

I have also been very surprised by the small size of research teams at KEK. Despite the limited number of research staff available, the Japanese groups try to cover as many topics as possible. This means that the number of people working on each project is much smaller than in Europe or America, resulting in more responsibilities for Japanese researchers and their students.

3. Life in Tsukuba, Japan

One of my main problems after I arrived in Japan was that it is hard to communicate in English in most of the shops and elsewhere. Thus during my first month I felt rather lonely. Then I discovered that Tsukuba has an active foreign community (see for example <http://www.alientimes.org> and <http://eve.bk.tsukuba.ac.jp>) and it became easier for me to understand life in Japan.

A friend of mine even introduced me to a Ken-do club where I learned this traditional Japanese sport. In this club I learned that the perfection of the movement is often more important than the game, thus the teaching was focused on learning Ken-do movements to aim toward the perfect movements. This is rather different from European sport training where less emphasis is put on perfection of the movements.

In Japan consumers often prefer to use products from famous brands rather than cheaper products from unknown brands. This certainly contributes to the high quality of many products available in Japan but it also makes impossible to find replacement parts for foreign electronic device: the power supply of my computer broke down and I had to import a new one from the United States as no replacement part existed in Japan.

Japanese people are very kind and very polite. Once on my way to a conference I stopped in a small city where I was planning to stay at the youth hostel. Unfortunately the youth hostel was closed for repair. I asked in a shop nearby if they could recommend me a hotel. Instead of just giving me an address, the shopkeeper phoned several hotels to enquire about prices and vacancies and then drove me to the one I had chosen!

One of the most interesting thing for a foreigner living in Japan is probably the Japanese culture. Shinto shrines are very interesting and often situated in beautiful location making their visit worth even for non believers. Japan is also the only place in the world where you can find mathematical problems in a religious building: Mathematics puzzles called Sangaku are sometimes hung as a votive offer to Shinto gods.

4. Conclusion

My two years in Japan are almost over and none of the problems I feared before coming here happened. I have discovered a country and a culture very different from what I expected. During my fellowship I have seen that Japanese research is different from what I knew in Europe but also performing very well. Life in Japan can be puzzling at the beginning but it is not as complicated as I feared, even when you do not speak Japanese. I am now returning to Europe but I am looking forward to my next trips to Japan.