

## 談話室

## Impressions from a user at the Photon Factory

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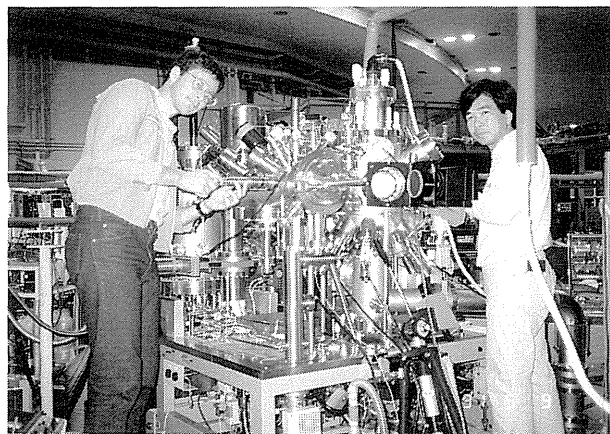
NTT Interdisciplinary Research Laboratories

Having been asked to write a short piece on my impressions of the Photon Factory and Japan in general I thought would be quick and easy. I was wrong. The reason for this lies in part because I have been in Japan for four years. The things that made the most impact on me happened in the first six months or so. After this period, I became saturated (just like gas adsorption on a metal surface!). Of course I am still surprised, bewildered and impressed by various aspects of Japanese life, but I have clearly hit the point of diminishing returns. Before I start, I might as well begin with a bit on my background.

My background in Synchrotron Radiation (SR) began at Brookhaven, where I worked for about 1 year on a beamline devoted to High Resolution X-Ray Emission Spectroscopy (HRXES) using SR as an excitation source. I was also involved in construction of a transmission grating monochromator on the beamline. I spent this year at Brookhaven as a graduate student at the University of Hawaii where I was involved in various aspects of X-Ray Spectroscopy. After finishing my graduate work, an opportunity was available for me to work as a postdoc at the University of Tokyo under Prof. Yohichi Gohshi. I spent two years over there where I was involved in some very interesting HRXES solution studies. During those two years I became acquainted with both the culture and language of Japan. I also had the opportunity to visit PF, even though I decided against doing any SR experiments during this time. There were two things that I

clearly remember from my first PF visit. The first was the high quality of instrumentation, especially in contrast to what I saw at the very best Japanese universities. It was clear to me that the PF was well funded to do state of the art research. The second thing that amazed me was the country feeling I got from a place that takes only 1.5 hours by Bus from Tokyo Station.

About 6 months before my JSPS (Japan Society for the Promotion of Sciences) term expired, I received a phone call from the head of the Synchrotron Radiation Analysis Research Group at NTT (Dr. Masaharu Oshima). He expressed an interest in my joining his research group for 1 or 2 years. After meeting Dr. Oshima at NTT, I knew that this would be an opportunity to work with some very good



高工研 PF BL-1A insitu 複合表面分析装置で実験中の著者 (左, 右は共同研究者 渡辺主任研究員 (NTT))

people, few financial constraints and excellent equipment. Not a bad combination.

After a delay or two in Hawaii (busy cultivating my lychee field), I finally arrived and was ready to work. I was impressed because I was already doing experiments at the PF with Dr. Oshima on my third day at NTT! I think I soon proved myself the next month with some interesting work on the desorption behavior of S passivated GaAs surfaces that has since been published in Phys. Rev. B. Since that initial work, I have focussed on various aspects of surface passivation and have benefitted enormously from learning various aspects of Molecular Beam Epitaxy and Surface Science. And I think I have been a quick learner and productive worker. The research I have been involved in was performed on NTT's beamline BL-1A and deals with surface passivation of III-V compound semiconductors (mainly GaAs) and fabrication of high quality surface and interfacial structures. Details of this work have been discussed in a review article I have just submitted to this journal. I have also had the opportunity to do some interesting work with Yasuji Muramatsu (also of NTT) on

HRXES studies using the undulator beam on BL-16.

After working on and off at PF for nearly two years, my overall impression is quite favorable. The PF is a place to do your work and get out. In this respect, it is not much different from Brookhaven, as I experienced it. The beam lifetime is quite regular and with just about anything in Japan is very reliable. But at the same time, I was a bit disappointed with the poor clean room and chemical room. It seems to be such a waste that so much money is spent on the synchrotron facility itself and so little on a laboratory that would make work much easier from the users perspective. However, the PF is not unique in this deficiency. My other objection deals with the overall ambience of the PF and Tsukuba. While I am impressed with the speed in which the seemingly disposable buildings are constructed, I am singularly unimpressed with their aesthetic quality. I hope some changes are made in the future. I know there will be progress when I can walk through a building without worrying about hitting my head on the top of the doorway (I am nearly 190 cm tall).

