What I see after getting a faculty position in America from Japan

Yoke Khin Yap*

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Abstract

I have lived in Osaka for about seven years and am now a faculty member at Michigan Technological University (Michigan Tech. or MTU). In this article, I will first describe my background, my stay in Japan, and then about Michigan Tech. I will then compare the research environments between Michigan Tech and Osaka University. Finally, I will offer my personal suggestions about an opened/globalized system in Japan for the continuing leadership of Japan in scientific research that involved foreign researches.

From Malaysia to Japan and now in America

I am a Chinese Malaysian born in Kuala Lumpur. Like many developing countries, we have excellent undergraduate programs in local Universities but are lacking experiences and infrastructures to conduct world-class PhD programs in the fields of Science, Engineering and Technology. Here, I must take the opportunity to thank the Japanese Ministry of Education (the former Monbusho) for providing me a scholarship for my PhD program at Osaka University. This offer has been the turning point of my life, without which, I will not be what I am.

My stay in Osaka for the past seven years has been a fruitful one. I reached Osaka in the beautiful "Sakura" season of 1995. As a Monbusho-sponsored student, I spent my first year as a research student in Osaka University. To me, Osaka was a totally new environment with very different lifestyles, peoples and language. One year is enough for me to adapt myself to most Japanese customs, language and research lifestyle in Osaka University.

I was working under Professor Takatomo Sasaki in the Department of Electrical Engineering. After my PhD program between 1995-1999, I was in the same laboratory for my postdoctoral research until January, 2002. My postdoctoral tenure was sponsored by NEDO (New Energy Industrial Technology Development Organization) and JSPS (the Japan Society for the Promotion of Science). In these seven years, I earned myself a PhD, a small family of three, knowing many fantastic Japanese professors, colleagues and friends and finally secured a faculty position at Michigan Technological University (Michigan Tech or MTU) in the United States of America (USA).

Michigan Technological University

Michigan Technological University was founded in 1885 as a mining college. Today, Michigan Tech is one of the top ten technological universities in the USA (*money Magazine*). Michigan Tech is small as compared to Osaka

* Yoke Khin YAP
1968年9月生
1999年大阪大学・工学研究科卒業
現在, Department of Physics, Michigan Technological University, Assistant Professor, PhD, Materials Physics & Laser Physics
TEL +906−487−2900
FAX +906−487−2933
E-Mail ykyap@mtu.edu

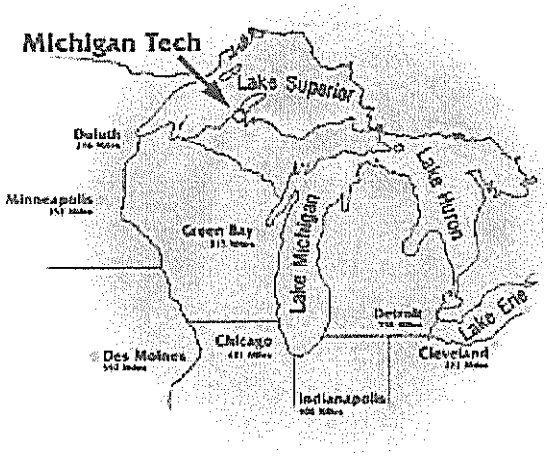

Figure 1. Location of Michigan Tech on Keweenaw Peninsula.

University since we do not have academic units like medical, commerce and law. Michigan Tech's main campus stretches for about a mile along Portage Lake in Houghton, a city approximately 550 miles northwest of Detroit and 450 miles north of Chicago(1 mile = 1.609 km). As shown in Figure 1, Houghton is on the Keweenaw Peninsula, which extends into Lake Superior. Known for its rugged, unspoiled natural beauty, the area has been nicknamed "copper country" because of its rich history of copper mining. Houghton is the safest college town in Michigan and the eighth safest in the nation(*Crime at College*). This year, Houghton ranked tenth as the best small town to live in the US by *Men's Magazine*. The main campus of Michigan Tech consists of about eighty buildings housing laboratories, classrooms, lecture halls, living accommodations, the library, the Memorial Union, the gymnasium, indoor tennis courts, and an ice arena. The University owns and operates an eighteen-hole golf course, a museum(A. E. Seaman Mineral Museum, since 1902), a downhill ski run with a chair lift and a musical center that has a 1,100 seat auditorium. The aerial view of our campus along the Portage Lake in Houghton is shown in Figure 2.

The University has an enrollment of approximately 6,300 students; nearly 700 are graduate students. We've been recognized for academic excellence by *U.S. News & World Report's*

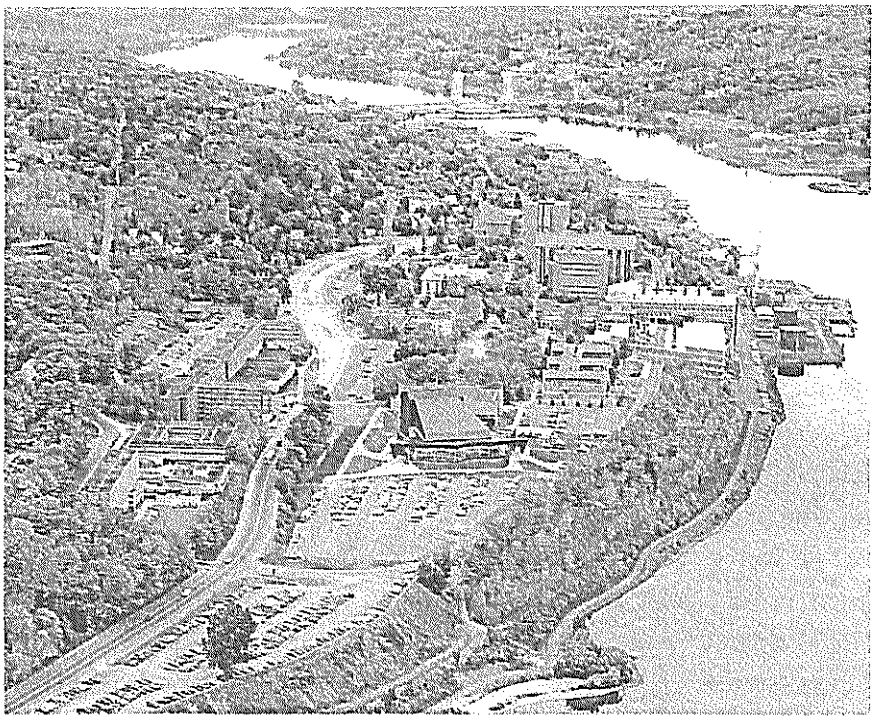

Figure 2. Aerial view of Michigan Tech's main campus along the Portage Lake in Houghton.

"America's Best Colleges," *Money Magazine's* "Best Buys in College Education," and *Peterson's Competitive Colleges*. Michigan Tech has some of the nation's largest enrollments in engineering programs and scientific and technical communication. National rankings in degrees awarded: 2nd in mechanical engineering, 3rd in environmental engineering; 4th in geological engineering, 8th in materials science and engineering, and the nation's largest program in scientific and technical communication.

Differences in research environment

The author is a faculty member in the Department of Physics and an adjunct Assistant Professor in the Department of Materials Science and Engineering. Let me compare the research environment as I observed in the Physics Department and Department of Electrical Engineering in Osaka University. This might not be uniform for other institutions in the US and Japan but nevertheless show the differences on the research lifestyle and system between the two countries.

The Japanese university is running the so called "Kouza" system, where each research group is lead by a Professor, an Associate Professor and an Assistant Professor. Three faculty members are working in a group on similar research program. This is different from that in the US, where faculty members are managing their own research program. In general, there will not be two faculty members conducting the same research activity in a department and even in a university. However, several faculty members can have quite similar research interests. Interaction and collaboration between faculties are very common. The Japanese system emphasis "team work" while in the US is more "solo" but collaboration on project basis is common. Our department in Michigan Tech is organized in a family manner. Senior Professors offer guidance to junior members like what we have in Japan. In fact, offices of all faculty members are next to each other.

Another difference between American and Japanese universities is the student resource. For instance, most graduate students in Osaka University are in their Master programs. Almost all undergraduates in engineering school stay for their second degree before getting a job in the industry. However, only a small portion of them are willing to continue for their PhD. Note that most of these students are paying fees for their second degree. These students have been the work forces in a research laboratory of a Japanese university. They are *real hard worker*-typical Asian style. Many academic interactions can be made when working together with these energetic students. Such kind of team working manner is the traditional and important element in Japanese research. Likewise, most American students get a job after their first degree. Most graduate students in our Department are PhD students from foreign countries and they are usually financially supported for their study either through graduate teaching assistantship(GTA) or research assistant ship(RA). They have to work on teaching and course work besides their research project. They need to work very hard by themselves because many qualifying exams must be fulfilled before becoming a PhD candidate. Students spend typically five to six years for their PhD. A significant difference is the working hour of faculty staff. Most faculty members here works from 8 in the morning and gone for the day around 5 to 6 in the evening. In Japan, faculty members can work until the late evening.

Career opportunity for foreign researchers in Japan and America

Because of the advanced infrastructure, foreign researchers with ability who are willing to work hard can always gain good results in Japan and America. Financial supports are available for their postdoctoral tenure in both countries. Personally, I have learned allot dur-

ing my stay in Sasaki Laboratory(PhD to postdoctoral tenure). The *flexible and creative* research environment that I have been offered in the laboratory should be taken as a good model for other researchers in Japan.

However, the efforts to promote scientific research in Japan have not been supported after the postdoctoral level. For example, most foreign researchers cannot secure a permanent research or academic position in Japan after their postdoctoral tenure. *The Japanese universities and national research centers are still not open for international competition*. Foreign researchers cannot secure a "tenure-track" position in Japan ("tenure-track system" is not available in most Japanese research institutes). Even if a foreign researcher found a position to continue their research after their postdoctoral positions, they might still have problem on writing proposals in the Japanese language. This is the *biggest difference* between Japan and America. In America, many positions in National Laboratories and Universities are open for competition. For example, I got my position here even though I have no working experience in the US and not holding a PhD from an American University. So, foreign researchers like me are trained out side the US but eventually are working and contributing to institutions in the US. I think America is successful at attracting prospective researchers to work in their institutions.

Suggestions

It is time for the Japanese system to change in order to retain and attract prospective foreign researchers. The Japanese government has trained many foreign researchers up to their postdoctoral tenure but have no system to accommodate them to continue their research in Japan. My suggestions are:

i) Continue and enhance the program of postdoctoral fellowship for foreign researchers.

ii) Create and open more tenure-track positions in universities and national research laboratories for international competition. This can help to attract excellent foreign researchers to stay and contribute to Japanese research and education. The open system in USA is a good reference.

iii) Create funding program that use English for research proposals and reviews. This can attract foreign researchers to *build their career in Japan, stay and contribute to the Japanese research activities*. Funding agency can reserve some programs that work in Japanese language or with the requirement of a Japan citizenship. Similar programs are very common in the US.

Finally, my opinion is: *An opened and globalized research/academic system can enhance the status of Japanese research and education. The ministry of education should show their leaderships for such a revolution*.

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