In Memory of Professor Wu Shiu-Chin

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In my sophomore year, we heard that Prof. Wu would join the faculty of the Physics Department in the fall semester of 1982. The department had added one or two new faculty members every year. We were particularly anxious and excited for her return since her success story was like a legend. She was a role model for us. Ten years ago, she graduated from the same department as us then proceeded to attend graduate school in Caltech. Her thesis work was a very important measurement for understanding the CNO cycle in astrophysics.

She taught Nuclear Physics the semester which she arrived at Tsing Hua. I could not miss the opportunity for taking it. The textbook was different from those which were commonly used then. It thoroughly described each topic. Several subjects required a good knowledge of quantum mechanics. Some of us were taking quantum physics at the same time. We were lost from time to time. She understood our difficulties. She encouraged us to learn as much as we could. She did not expect us to deal with the algebra and mathematics. She told us that we might not be able to learn everything the first time, but that we should remember that we had encountered the subjects. Consequently, when the same subject came up in the future we should be able to find where we had seen it quickly and study it again. This way we would be able to learn efficiently.

In her Nuclear Physics class, she prepared us to become researchers. Many of the homework assignments asked us to look up numbers or graphs in reference books. It was a lot easier than working through tedious algebra and deriving equations as in other courses. I did not appreciate it until I started working on research projects. This hands-on approach was very new to me, but it was one of the most important and useful skills that I acquired in college.

When I was a senior, I took the Research Project course and Prof. Wu was my advisor. In the previous year, I learned that in experimental nuclear physics one gets to work with a group of people, and the size of the group is just right. Besides Prof. Wu and myself, our group consisted of her graduate student Hsiung Gao Yu and my classmate Shen Ji Min. My project was using the ^{27}Al(p,γ) reaction to calibrate the analyzing magnet for the accelerator in the Accelerator Laboratory. It was my first experience with the “real world”. I was given a logbook to record events that had occurred while preparing and running experiments and any thoughts regarding the experiments. That was not taught in the classroom. In the regular lab courses, such as the freshman physics lab and modern physics lab, we read what measurements would be carried out and copied it to the lab report. We wrote down what we measured in the lab and calculated the quantities that were specified by the instructional manual. Finally, we wrote the conclusions in which for nine out of ten experiments the measurements were in good agreement with what the textbook said. Professor Wu explained that a logbook was in practice a technical diary. You wrote things for yourself and for your collaborators to read. Moreover, something might seem obvious at the time which it occurred. A week later, it might not be so. I am really glad I received that good advice back then.

The objective of my project was to determine the energy of the beam provided by the accelerator. The procedure was to find the resonances in the ^{27}Al(p,γ) reaction. We started with a thick target to get an idea of where the resonances would be. Then a thin target was used to better determine the location of the resonances. It was straightforward with the thick target. With the thin target, it involved changing the beam energy in small steps to map out the resonances. It was tricky to guess what the size of each step should be. Prof. Wu taught me to take somewhat larger steps for the first round. Even if I missed the resonance, I could

go back and try a smaller step size. That way I would not spend a lot of time carrying out measurement at off-resonance if I took small steps and the energy was far away from the resonance. Up to this date, I still apply the same technique for measuring excitation functions and performing simulations to estimate experimental yields.

There were many drawers, cabinets, and shelves in the Accelerator Laboratory. Many useful tools, parts, and documents were carefully stored in them by the technical staff. In one occasion, I saw Prof. Wu rummaging through a drawer. I asked her what she was looking for. She said that she was not looking for anything in particular. She was just checking it out. She explained to me that it was useful to get familiar with each drawer and cabinet in the laboratory. When the technicians were not around, you would have a better chance finding what you needed. Since graduate school I have worked in laboratories that are larger than the Accelerator Laboratory. It is very important to be able to find what is needed to set up an experiment. During an experiment run, if something breaks, it is crucial to find spare parts to keep the experiment going. Exploring drawers and cabinets whenever there is a chance certainly helps in those situations.

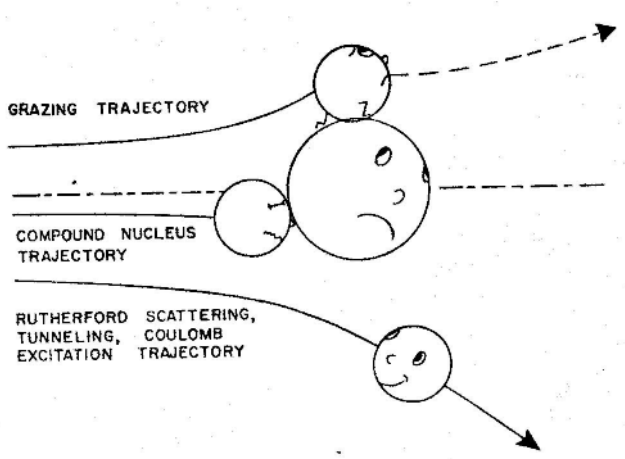
One of my research interests has been in the study of nuclear reaction dynamics. Several years ago, I visited Prof. Wu back in Tsing Hua and presented a seminar. I showed one viewgraph which has a cartoon illustrating the processes of two interacting nuclei. It was a simple drawing. She asked me where the faces were. I realized what she meant right away. In the textbook of her Nuclear Physics class there is a cartoon that illustrates the same idea and some faces with expressions are drawn on the nuclei. Although the two cartoons present the same idea, the one with faces leaves a better impression. She is an outstanding teacher. She can convey her ideas with effective communications. Prof. Wu was very fond of that cartoon. I include it at the end of the text.

I attended an international nuclear physics conference at the end of September. In the meeting, we discussed aspects of nuclear collisions and dynamics near the Coulomb barrier. One of the topics was fusion in nuclear astrophysics. The ^{16}O on ^{16}O fusion data measured by Prof. Wu in Caltech were cited. After thirty years, her measurement is still very important in our community. I wish I could tell her what was discussed in the meeting. I was very proud of her.

Two years ago, I had a chance to visit Taiwan. I contacted Prof. Wu to see if I could meet her in Tsing Hua. It was to my surprise that she was in California. We talked on the phone. She told me that her cancer had recurred, and she was getting treatments. She knew that she might not be completely rid of cancer but would have to live with it. However, she sounded upbeat and optimistic about the outcome of her treatment. I wrote to her earlier this year to see how she was doing and what her summer plan was, but I did not receive any reply from her. I did not know that her health was deteriorating.

Professor Wu was a very dedicated and caring teacher. She was also a very talented and brilliant researcher. She treated her students like her little siblings. She encouraged me to go to graduate school. She supported my drive to pursue a career in physics. She inspired me to delve into experimental nuclear physics research. I am very grateful to have the opportunity to meet such a wonderful teacher. She will be missed.

Liang Junjien



P. Marmier and E. Sheldon, Physics of Nuclei and Particles, Academic Press, Inc., New York (1970).