37 years at the Institute of Space and Astronautical Science (ISAS)
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in ISAS office

Including my graduate school years, I have belonged to the Institute of Space and Astronautical Science (ISAS) for 41 years. In early years, I was involved in laboratory experiments related to space plasma physics under the direction of Prof. Nobuki Kawashima in the division of the upper atmospheric physics of ISAS in Komaba Campus. My senior, Nobuyoshi Ohyabu (later, a professor of National Institute for Fusion Science) found a strange phenomenon; when a high power microwave pulse was injected into a high density magnetized plasma, microwave emissions appeared intermittently at different frequencies after termination of the microwave pulse pumping. Why? It was my major task to solve the problem. It was a fairly complicated phenomenon, but the complicated processes were gradually clarified. This research gave me a sense of the fun and excitement of space plasma physics. Probably I would have been back to my hometown in Hiroshima if I did not have this experience.

After the initial research, I was involved in the research project of Prof. Tatsuzo Obayashi to use the space environment as a laboratory of plasma physics. This project was aimed to generate an artificial aurora by emitting an electron beam from the space shuttle. I was in charge of development of diagnostic instruments under the guidance of Masaki Ejiri (later, a professor of National Institute of Polar Research). As it was a joint experiment between Japan and the United States, there were many opportunities to visit NASA and other foreign institutes for negotiations. There were many cold sweat scenes, but more than that, there were a lot of enjoyable

experiences. At roughly the same time, I participated in a series of Japan-US joint tethered rocket experiments started by Professor Koichiro Oyama. For these projects, I traveled out of Japan quite often. In the first half of the 1980's, when I came back home, my son was a bit scared as if he met someone new.

After these projects, I left the field of the space experiments for plasma physics. I got interested in space environments generated surrounding a large space structure by the interaction with space medium. I named this field as “Spacecraft Induced Environment; SIE”. This problem is important with the progress of activities of the human being in space. It was a theory of Prof. Obayashi that a part of the human race eventually leaves the earth and lives in space. He said it was destined on the human genes. I think this idea was naturally transferred to me when I was traveling with him as a "boss' bag-carrier". I made a lot of efforts to promote the “SIE” research on the international space station with foreign researchers, but it was not successful because of repeated delay of the space station program. The SIE research was realized in the SFU project started by Prof. Kyoichi Kuriki. In addition to the SIE research on SFU, I was responsible for SFU mission planning as a system member for operations. It was a good opportunity for me to manage a space project. In the SFU project, I was deeply impressed by the retrieval operation by Prof. Takahiro Yamada who made a critical operation to separate the troubled solar array paddles.

In 1991, I moved from the science department to the engineering department and started research on solar power satellites (SPS) under Prof. Makoto Nagatomo. After that, I have been involved in SPS research for over 20 years, and this has become my life work. Prof. Nagatomo was an outstanding system engineer, but more than that, he was a scientific thinker and I was greatly influenced by his philosophy. Starting with the design study of the model called SPS2000, I was involved in the design of various types of SPS. Since 2008, I participated in research and development of SPS in the Advanced Mission Research Group in Thukuba. The feasibility of SPS is still controversial, but I am convinced that SPS can be realized both technically and socially.

At the end of the SFU project, Prof. Koichiro Tsuruda invited me to participate in the lunar exploration project “SELENE”. In the project, I coordinated the development of the mission instruments with Dr.Yuichi Iijima. Although I was not an expert in lunar science, I made maximum efforts in promoting the project with the project manager Mr. Yoshisada Takizawa. It was a large project involving researchers from many different organizations. Although there were often administrative and technical difficulties in promoting the project, it resulted in successful mission and a large amount of scientific data were obtained. SELENE was an unforgettable project.

Last but not least, Prof.Nagatomo had expounded that "academic activities are in the human relationship around the truth." I'm not sure if I had been around the truth, but I would like to express my sincere thanks to ISAS for giving me many good human relations for many years.