Opening Address

Ladies and Gentlemen,

With your permission, I have the great pleasure to open the 17th International Linac Conference at Tsukuba, Japan.

I have been reminiscing and have recalled that I first learned about modern linacs around 1955 when I moved from the Department of Physics to the Institutes for Nuclear Study at the University of Tokyo to take charge of constructing a 6-MeV electron linac. This linac was planned to be used as the injector of a 1-GeV electron synchrotron, which was to be the first high-energy accelerator built in this country after World War II. Starting by reading the excellent book "Microwave Electronics" by J. C. Slater (published in 1950), I learned many things, particularly from "Linear Accelerator Issue of the Review of Scientific Instruments" (Vol. 26, No.2), 1955, and papers kindly sent by Mr. W. Walkinshaw on the early work of his group at the Telecommunication Research Establishment in England.

Owing to these pioneering efforts on modern linear accelerators using high-power microwave sources, as well as the collaborations of many leading industry leaders and engineers, we succeeded in the initial operation of the first national linac in February, 1961.

A few years before that time, the late Professor Hiroo Kumagai, who was the director of the entire 1-GeV electron synchrotron project, and myself started a feasibility study on high-energy, high-intensity proton linacs for the future high-energy physics program in this country.

In the fall of 1961, I first visited abroad to attend the (first) "International Conference on High Energy Accelerators" held at the Barbizon-Plaza Hotel in New York City and the Brookhaven National Laboratory. On that occasion, I also visited several U. S. laboratories, mostly together with Professor Shigeki Suwa, who was the first Director General of KEK and was staying at the University of Minnesota at that time. Everywhere we visited, we received very kind hospitality and became acquainted with many distinguished accelerator scientists, such as Professor and/or Dr. Bob Wilson, John Blewett, Pief Panofsky and Lloyd Smith.

At the Conference, I presented a paper "On a Design of the Disk-Loaded Proton Linear Accelerator" as the result of a feasibility study in cooperation with Professor Kumagai. But, I also learned that similar studies had been made at U.S. laboratories, and that a small informal conference on such a specific problem had been held at the Brookhaven National Laboratory just before the International Accelerator Conference. From the record, I found it was such a small meeting that only 20 participants contributed 17 papers. I know that it was the origin of a series of today's conferences, although most of the participants

were U. S. scientists. Dr. John P. Blewett, who was granted the 1993 Robert R. Wilson Prize for his many contributions, beginning in the 1930s, to accelerator physics and technology, was the organizer of the first and second conferences.

In 1964, he also invited me to join the Brookhaven's Advanced Accelerator Development Division (A^2D^2) as a visiting scientist. The Fourth Linear Accelerator Conference was held in July of the same year at MURA, i.e. the Midwestern Universities Research Association, Madison, Wisconsin. I believe that it was the first really international conference in this series; about 100 participants represented 24 institutions, coming from seven different countries. Many European scientists attended the Conference, including Professor Herwig Schopper, the later Director General of CERN. For me, too, it was the first chance to attend a conference of this series. The Conference was very exciting towards high-energy, high-intensity linear accelerators for both protons and electrons. Dr. Gregory A. Loew presented a "Progress Report on the Stanford Linear Accelerator Center" where the construction of a 3-km-long electron linac was in full swing, and Drs. Edward Knapp and Donald E. Nagle gave a new 800-MeV proton linac plan at the Los Alamos Scientific Laboratory.

Today, we are gathering at Tsukuba just 30 years after the MURA Conference. During these three decades, much remarkable progress concerning linear accelerators has been made in various aspects of theoretical and experimental studies. Their results have been reported in published or/and unpublished papers, particularly in proceedings of every conference of this series. They have been summarized in such publications as the thick red book "Linear Accelerators" edited by Drs. Pierre M. Lapostolle and Albert L. Septier, and more recently "Advances of Accelerator Physics and Technologies" edited by Herwig Schopper.

Now, the number of participants of this Conference is coming up to around 400, or four-times that of the MURA Conference, about half of them from abroad; this represents 12 different countries, or twice that at the MURA Conference. Correspondingly, the topics expected at this Conference are very different and advanced from those of the MURA Conference. As you can see from the program, status reports and related topics on linear colliders, high-intensity proton and electron linacs, heavy-ion linacs, superconducting linacs, induction linacs, free-electron lasers, and other new-concept linacs are all very interesting. Advanced technologies related to accelerator components should be of great importance to achieve present plans and future adventures with linacs. They are ion sources, electron guns, RF power sources, accelerating structures, control systems, beam monitoring and measurements, as well as studies on beam dynamics and beam instabilities. Applications of linacs to medical therapy and diagnosis, synchrotron radiation, neutron, meson and muon sources, and nuclear energy programs are rapidly increasing, so that the word "Accelerator Science", which, I think, John Blewett and myself first introduced at the U.S.-Japan Seminar in

1973, has become familiar among industries as well as universities and research institutions.

Specifically, I wish to mention that the idea and R&D of linear colliders, the practice of using superconducting cavities, computational analysis of beam and cavity problems, the use of linacs for a rich synchrotron radiation spectrum, and so on are completely new topics which were never anticipated at the MURA Conference. Moreover, I do hope that this conference will yield more ideas and technologies which may overcome difficulties for the future development of linear accelerators, in particular linear colliders.

Finally, I and my younger colleagues are very happy to organize this Conference in Japan, or in the East Asian region as the first time in the history. So far every conference of this series was held in the U.S., except for Canada and Germany. As a result, we can invite many accelerator scientists from the Orient and Russia. We are also delighted that you will have a little time to look around Tsukuba Science City, particularly KEK, and to visit other sights in this country. You have a busy schedule and I, too, regret my tight schedule at the present affiliation. Thus, I'll not take more of your time, except again to say welcome and to have a wonderful conference.

Thank you.

Tetsuji Nishikawa
Conference Chairman