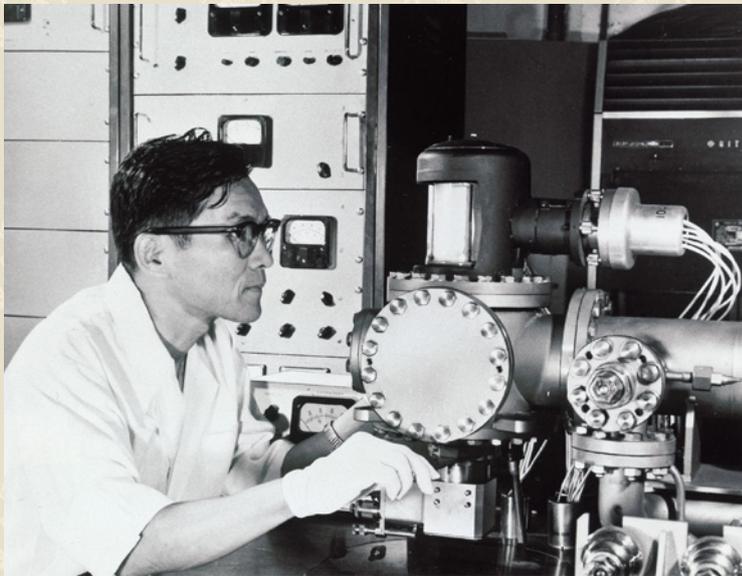




**Dr. Chikara Hayashi, Third President of ULVAC, Inc.**

**A father of vacuum technology who contributely immensely to Japanese industries**



**Low-energy electron diffraction (LEED) system and Chikara Hayashi**

Our company's third president, Chikara Hayashi, is truly at the heart of ULVAC's identity. His determination to enrich the world with vacuum technology and his engineering DNA are still traits our researchers embody and cultivate. Hayashi achieved many breakthroughs for technology and industry. He was world-renowned as a scholar and collaborated closely with scientists from around the world.

**Dr. Chikara Hayashi's background**

He was born in Tokyo, but because of his father's occupation, he lived in Taiwan from elementary school through high school. In 1942, he entered the Physics Department (Science Faculty) of Tokyo Imperial University. In 1944, he was assigned as a naval officer to Toyokawa Naval Arsenal in Aichi Prefecture. After the war, he joined a major optical product manufacturer. However, he quit after three days when he saw that his dormmates spent all their time complaining and gossiping. He felt he had not survived the war in order to spend the rest of his life with people like that, that doing so would dishonor his fallen comrades. In 1945, he became a researcher in the Physics Department (Science Faculty) of Tokyo University. When Hayashi was working as a researcher, Hitoshi Imachi of Toshiba Matsuda Research Laboratories (who later became the second president of ULVAC) asked him to join in an effort to start a vacuum company that would contribute to industry and help vacuum technology take root in Japan. Hayashi accepted and participated in the founding of Japan Vacuum Engineering Co., Ltd. He later became the third president of ULVAC, serving in this role from 1971 to 1986. In 1981, Hayashi also served as General Manager of the Hayashi Ultrafine Particles Project, started by the Research Development Corporation of Japan (which later became the Japan Science and Technology Agency (JST)). Since university professors were being selected to head most other projects at that time, it was quite unusual for the president of a private corporation to be chosen.

**• Infinite possibilities for vacuum technology**

“There will be three stages in the development of vacuum technology. The first stage was the era of learning to create a vacuum. The next stage is the age of vacuum applications (utilization). And the third stage will be the age in which humans fly into space in a capsule and conduct experiments in an infinitely expansive vacuum environment.”

This is what Chikara Hayashi wrote around 1960 when he was asked by a magazine about the development of vacuum technology.

Vacuum technology around 1952, when ULVAC was established, was in its dawning period, between the creation of vacuum and its utilization. What kind of person was Chikara Hayashi, who had such a grand vision for vacuum technology?

**• A committed researcher and a university startup**

Chikara Hayashi, who has spent many years of his life immersed in research, said that he used to be very bad at physics, especially in junior high school. It was not because he lacked intelligence. Rather, because he was very bright, he kept moving from physics into a more philosophical realm, and asking questions such as, “Why is there gravity?” and “Why is there light?” In high school, he said, he read all the philosophy books he could find.

After the war, Hayashi studied nuclear physics in the Sagane Laboratory at Tokyo University, but not because he planned to become a scholar. Hayashi's standard for judging whether something was of value was whether it was interesting, regardless of the prestige of universities or companies.

When he was 29 years old, Hayashi was asked to join in the founding of Japan Vacuum Engineering Co., Ltd. (present-day ULVAC). The company began with only 10 people, mostly researchers, and was an early version of a university startup. While scholars often manage companies in the U.S., this type of scenario was extremely rare in Japan.

For the first 15 years, the company essentially continued to be in the red. Companies that excel in research often run into financial trouble. The company survived despite these odds, thanks in part to the hard work of its employees but especially because of the support of its founding members, including Konosuke Matsushita (Panasonic Corporation founder). Every time the company was close to running out of funds, it asked for an increase in capital and used that money to pay small dividends, managing to limp along by repeating this strategy.

**• A sense of mission to enrich the world through vacuum technology**

Hayashi, who had a physics background, was extremely good at pursuing what he

instinctively felt was important, but he tended to think that he “had to” investigate it in great depth. However, the world’s economy does not run on a 20- or 25-year cycle, which is how long it usually takes for research to bear fruit. If a company does not make new things and create new markets, it will not become a major corporation or make much money. Even so, those involved in developing vacuum technology in Japan at that time tended to focus more on research, which was what gave their lives meaning.

Founding members such as Konosuke Matsushita and Gen Hirose (President of Nippon Life Insurance Company) sometimes used to give advice to Hayashi, who tended to put R&D ahead of business opportunities. Later, Hayashi said the following in his biography:

“Although my position within the company had been rising, I was doing

Hayashi had also met the astronaut Mamoru Mohri. Since they had both been members of the Vacuum Society of Japan, they had stayed in contact with each other, and an exchange between them was featured in the “Opening Conversation” of the 1993 issue of our company’s PR magazine. Mohri, who worked at the High Vacuum Laboratory of Hokkaido University before becoming an astronaut, must have hit it off with Hayashi, who had studied vacuum in a university laboratory.

Furthermore, in Chigasaki City, Kanagawa Prefecture where ULVAC’s Head Office/Plant is located, Hayashi served as the first leader of the Chigasaki Chapter of the Young Astronauts Club of Japan. Since astronaut Soichi Noguchi is from Chigasaki City, the Chigasaki Chapter and Chigasaki City together still host a variety of activities to promote “Space City Chigasaki” to a worldwide audience and

The children were overjoyed by this unexpected turn of events.

### ● Hayashi Vacuum Innovation Fund and the Spirit of our Heritage

Hayashi stuck to the principle of never compromising in R&D and never approving anything incorrect, but at the same time he freely provided support to aspiring researchers. He personally made a donation to the Production Technology Research Laboratory of Tokyo University, where he had studied, and the money is being managed as the Hayashi Vacuum Innovation Fund. The main operations of the Fund are as follows: (1) holding exhibits related to vacuum technology, (2) organizing international conferences related to vacuum technology, and (3) supporting students from Southeast Asia. Regarding (3), Hayashi requested that the students be



Mr. Mohri is in the center of the front row, and Chikara Hayashi is on the far left.



In the 1980s, during a general shareholder’s meeting, President Hayashi (right) verbally expressed appreciation to Konosuke Matsushita (left, founder of Panasonic Corporation), who was a founding member and outside director of ULVAC.

my work out of a sense of mission. I wanted to use vacuum technology to help rebuild Japan’s economy and industries. I had a sense of mission that I had to do it for the sake of the Japanese people.” (“Benefactors of Japan’s Vacuum Technology” Hakujitsusha, page 217)

### ● Chikara Hayashi, Space, and Vacuum

Hayashi had a strong sense of duty, was honest, had associated with people in many fields, and took good care of his employees. He also had a global viewpoint. As president, he often told his employees to be sure to make friends if they went overseas.

help people become more familiar with space exploration.

Soon after the establishment of the Chigasaki Chapter, an incident occurred that showed how well connected and popular Hayashi was.

A group of children led by Chikara Hayashi as chapter leader went to tour NASDA (present-day JAXA) in Tsukuba, Japan. Although the children had been told beforehand that Mr. Mohri was too busy to meet them, they spotted him walking on the campus, and Hayashi negotiated with the Office to see if Mr. Mohri might be able to meet with the children very briefly. Mr. Mohri immediately responded, “If it’s just for 10 minutes, I can meet with them.”

taught engineering at corporations, in addition to being taught science at the university. Therefore, ULVAC has taken on this responsibility and now accepts interns from overseas. The goal of these internships is to educate young people in vacuum technology and encourage them to be at the forefront of next-generation science and technology.

Hayashi’s determinations to let his sense of mission guide his work, to “be useful to society,” and to nurture his creative DNA focused on innovative research are at the very roots of ULVAC. Our researchers continue to embrace these strategies nearly 70 years after the company’s founding.